

ORIGINAL CONTRIBUTION

Financial resilience through organisational readiness: Mediating role of digital financial innovation and digital financial literacy, and moderating role of financial inclusion

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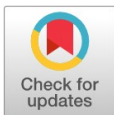
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Abstract— In developing countries like Pakistan, digital financial innovation and financial literacy are essential for improving financial resilience. Enhancing financial resilience helps developing nations build sustainable companies that are protected from economic vulnerabilities, thereby contributing directly to sustainable development goal SDG 9 (Industry, Innovation, and Infrastructure) by fostering technological upgrading and to SDG 1 (No poverty) by strengthening access to financial services that protect vulnerable populations from economic shocks. However, a lack of readiness for digital transformation leaves firms facing significant challenges, including operational inefficiencies, slower adoption of innovation, reduced customer engagement due to cybersecurity risks, poor data management, and long-term success. This research investigates the role of organisational readiness in enhancing financial resilience, with digital financial literacy and digital financial innovations as mediating factors. The study also investigates the moderating role of digital business strategy and financial inclusion. Using Structured Equation Modelling (SEM), the digital adoption and transformation of firms to improve financial resilience are analysed. The authors find that organisational readiness has a significant positive impact on digital financial innovation. A similar impact of organisational readiness is observed for digital financial literacy, but not for change valence. Thus, the findings support the mediating impacts. Similarly, financial inclusion moderates the relationship of organisational readiness and digital financial innovations and digital financial literacy. Organisations and policymakers can develop appropriate strategies and allocate resources for technology adoption and transformation to build financial resilience and avoid risks.

Index Terms— Financial inclusion, Digital financial innovation, Organisational readiness, Digital business strategy, Digital financial literacy, Financial resilience

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Introduction

Studying the factors influencing financial resilience is vital for a country like Pakistan, which is at risk of bankruptcy due to currency depreciation and political instability. Economic security and resilience are an important part of national stability and security (Saudi et al., 2020). This study's outcomes may help businesses build strong financial resilience through digitalisation to survive uncertain financial distress. Systematic political instability has caused constant challenges for Pakistan's government, businesses, and households. Due to macro uncertainties, policymaking at the government level and strategy formulation at the corporate level have become very challenging (Mufti, 2023). Interest rates are at record highs, making financing for productive activities difficult to obtain. Moreover, political instability and currency devaluations have led to an uncertain

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business environment, operational inefficiencies, increased production costs, price volatility, and higher capital costs (Ahmad et al., 2024; Ghauri et al., 2024). In such uncertain situations, digitalisation helps firms attain financial resilience and a competitive edge (Sreenivasan & Suresh, 2023). Internationally, financial literacy and Inclusion are influential buffers against financial distress and have built financial resilience by minimising vulnerabilities. Khin and Ho (2019) argue that business operations can be better handled using Digital Financial Innovations (DFIs). Artificial intelligence, peer-to-peer technologies, social networks, crowdfunding, blockchains, big data analytics, and the internet are included in the DFIs (Du et al., 2020). The theory of DFIs used in the current study compares a firm's DFIs with its rivals on quality, application, distinction, and features. Digital Financial Innovations (DFIs) offer many advantages to businesses, such as high profits, better customer experience through financial inclusion (Aisaiti et al., 2019), enhanced market value (Lam et al., 2019), solid social ventures through crowdfunding Mollick (2014), enhanced performance of supply chain finance (Du et al., 2020), and protection from natural disaster risks (Barnes, 2020), e.g., COVID-19.

In addition to many cost and efficiency advantages, DFIs diversify the risks for all stakeholders and support businesses' digital transformation (Longworth, 2020). Similarly, Digital Financial Literacy (DFL) is the ability to read, analyse, manage, and communicate financial position (Anderson et al., 2000; Xin et al., 2020). Hence, DFL is the commitment to change for better performance and adoption of financial Knowledge. Organisational Readiness Theory (ORT) is embedded in change management and provides vital theoretical aids for gauging organisations' readiness to adopt DFIs and DFL (Lokuge et al., 2019). Organisational readiness is essential to realising the full benefits of DFIs and DFLs (Jun et al., 2022). However, organisational readiness is lacking, hindering firms from nurturing such advantages (Lokuge et al., 2019).

The adoption of digital resources, Financial Inclusion (FI), and Digital Business Strategy (DBS) plays a significant role in enhancing the impact of Organisational Readiness Theory on DFIs and DFL (Byegon et al., 2019). So, a transition strategy from conventional procedures to digital innovations is required for business excellence. By embracing digital technologies, organisations can enhance their financial and operational achievements (Daidj, 2019). Hence, businesses in the modern era should adopt all the above-mentioned digital factors to manage financial distress Nkundabanyanga et al. (2020) and improve financial resilience. Moreover, financial resilience enhances a firm's capacity to prevent, respond to, and adapt to incremental changes and sudden/unexpected disturbances. Financial resilience helps avoid budget deficits by promoting prosperous and suitable economic plans (Acquaah et al., 2011).

DFIs and DFLs are vital to enhancing a firm's competitiveness and enabling it to overcome competitive challenges (Hua et al., 2019). Organisational readiness, financial inclusion, and digital business strategy enhance the adaptation and use of DFIs and DFLs. Panel A of Table 1 presents the abbreviations of variables employed in the current study. Change valence, organisational culture, change efficacy, human, material, and financial knowledge, and the use of tangible/intangible resources encourage innovation (DFIs), learning (DFL), and digital transformation (Jones et al., 2005), where a deficiency of organisational readiness for change hinders such adoption (Lokuge et al., 2019).

The current study's importance warrants mention, as organisational readiness for change has declined and earnings volatility has increased during COVID-19 in Pakistan. Hence, many businesses have shut down. The lack of empirical research on digital financial innovation and financial literacy Khin and Ho (2019) is the leading cause of business shutdowns during the pandemic. COVID-19 has disrupted financial stocks, leading to changes in plans due to payment delays and unpredictable customer service. However, digital financial transactions have enhanced financial resilience in the post-COVID period. The study aims to 1) examine the impact of organisational readiness on DFIs and DFL; 2) investigate the impact of DFIs and DFL on Financial Resilience (FA & FR); 3) investigate the mediating impact of DFIs and DFL between organisational readiness and Financial Resilience; 3) explore the moderating role of both FI and DBS between the relationship of (Organisational readiness and DFL) and (Organisational readiness and DFIs).

The research contributes to the prevailing literature: 1) All the factors mentioned earlier are based on organisational readiness (ORT) for enhanced financial resilience. The literature takes a comprehensive view of organisational readiness factors, including employee motivation, employee self-efficacy, capabilities, processes, conditions, values, and strategies. Nevertheless, the current study considers the new three dimensions (change efficacy, change valence, and contextual factors introduced by Weiner, 2009 to discover new domains; 2) Unlike previous studies, the current study uses the concept of ORT to promote the adoption of Digitalisation (DFIs & DFL) and improve financial resilience. Moreover, emerging economies are not well equipped for digital transformation, so a practical investigation is needed to explore the phenomenon. Hence, the current study explores how DFIs impact the financial excellence of businesses in volatile market conditions; 3) few studies have investigated the role of digitalisation, digital banking, and the development of Fintech Nasiri et al. (2020) and Wang et al. (2021) in enhancing financial performance. Therefore, the current study is a pioneer study that explores the mediating role of (DFIs and DFL) and the moderating role of (FI and DBS) in between ORT and Financial Resilience; 4) this is the first study that enhances the sustainability of DFIs and DFL in a developing country as state affairs of Pakistan are vulnerable (Okello Candiya Bongomin et al., 2020) to digital transformation. Finally, 5) The study's outcomes may help organisations build strong financial systems at the country level.

Table I

Panel A presents Variables and their Abbreviations; the abbreviated names are used hereafter in the paper. The demographic profile is presented in Panel B. (Source: Authors' own work)

Panel-A		
Variables	Abbreviations	
Organisational Readiness Theory	ORT	
Change Valence	CV	
Change Efficacy	CE	
Contextual Factors	CF	
Digital Financial Literacy	DFL	
Digital Financial Innovations	DFIs	
Financial Inclusion	FI	
Digital Business Strategy	DBS	
Financial Adaptability	FA	
Financial Robustness	FR	
Financial Resilience	Fin-Resl	
Panel-B		
	f	%
Industry		
Airline Services	67	13.7
Business service (e.g., Telecom, Engineering, Computing, advertising)	98	20.0
Education service	54	11.1
Financial services (Banks, Insurance)	90	18.4
Health care service	72	14.6
Hotel/Tourism service	44	8.9
transportation services/warehousing/Logistics	65	13.3
Managerial Tier		
Senior	180	37%
Middle	310	63%
Department Tier		
Finance	110	22.5
Operations	160	32.6
Strategy	54	11.1
IT	102	20.7
Others	64	13.1
Years of experience		
More than 20 years	86	17.6
Between 15 and 20 years	70	14.3
Between 10 and 15 years	130	26.5
Between 5 and 10 years	94	19.2
Less than 5 years	110	22.4
Employees		
More than 500	106	21.7
Between 200 and 500	174	35.5
Less than 200	210	42.8
Sales Level		
Greater than 5 Million (\$)	65	13.3
Between 2 and 5 Million (\$)	78	15.9
Between 1–2 Million (\$)	159	32.5
Less than 1 Million (\$)	188	38.3

Literature Review

The theory of organisational readiness outlines a comprehensive framework for evaluating the availability of organisations' resources for digital innovation. According to Lokuge et al. (2019), businesses should recognise the full potential benefits of adopting digital innovations, as the literature has clearly described their potential advantages. The complexity of Digital Business Strategy (DBS) hinders its future potential, and the current study seeks to consider these notions, as presented in Figure 1.

Nexus of change valence with Digital Financial Innovations (DFI) & Digital Financial Literacy (DFL)

Change Valence (CV) is an institutional commitment to adopting optimistic changes to improve performance. (Herscovitch & Meyer, 2002). In this research, CV is considered in terms of innovation-valence, attitude to learning (financial literacy), employee empowerment, and motivation to deliver innovation (Lokuge et al., 2019). To enhance digitalisation, employee empowerment and motivation are vital for digital change. Embracing new technology, altering employee roles, and working collaboratively and in coordination within the organisation may be necessary for digital change. A successful transition needs firm dedication to these changes. Similarly, “financial literacy is the ability to read, analyse, manage, and communicate about financial conditions that affect material well-being” (Anderson et al., 2000). Hence, the commitment to change for better performance and willingness to continue with new technology requires financial Knowledge, persuasion, choice, execution, and confirmation. These are steps in the adoption process for making an acceptance or rejection decision and confirming it (Abu-Assi et al., 2014). Hence, the study develops the following hypotheses.

H1: A positive relationship exists between change valence and the digital financial innovation of the firm.

H2: A positive relationship exists between change valence and the firm’s digital financial literacy.

Nexus of change efficacy with Digital Financial Innovations (DFI) & Digital Financial Literacy (DFL)

A firm’s apparent capability to adopt change is called change efficacy. So, change efficacy includes apprehension in the form of human, technical, information, and financial resources. It also includes how those resources can be successfully redesigned to implement the changes. Cognitive readiness, IT readiness, and resource readiness are particularly part of change efficacy (Lokuge et al., 2019). The flexibility of all resources in accepting the change is resource readiness. Resources may include technology, physical, human, and financial assistance to accept digital financial change and improve the employees’ financial literacy. In connection with digital change, it shows that institutions need to redesign their resources to realise the potential benefits of DFIS. Fuller et al. (2007) argue that the adequacy of institutional resources enhances employee training, financial literacy, office space, computer access, and financial services. Similarly, IT readiness requires a comprehensive transformational framework that leverages employees’ capabilities, infrastructure, stability, and flexibility to deliver fruitful outcomes (Chen et al., 2017). Developed firms that frequently use IT have become a foundation for success. It also enhances financial literacy by creating, storing, manipulating, and distributing information (Parasuraman, 2000). Moreover, readiness (cognitive) highlights the significance of knowledge for change. Cognitive readiness improves financial behaviour by providing information (financial Literacy) to confidently engage in the desired behaviour and develop an attitude toward innovations (Abu-Assi et al., 2014). The study develops the following hypotheses.

H3: A positive relationship exists between change efficacy and the digital financial innovation of the firm.

H4: A positive relationship exists between change efficacy and the digital financial Literacy of the firm.

Nexus of contextual factors with Digital Financial Innovations (DFI) & Digital Financial Literacy (DFL)

Contextual factors comprise partnership, strategic, and cultural readiness (Jones et al., 2005). The most critical elements for institutes are the contextual factors that promote supportive and conducive innovative behaviour. For example, institutional values (culture) are both inflexible and supple in adopting the IT revolution (Uzkurt et al., 2013). Culture allows financial literacy enhancement to adapt to digital change (Abu-Assi et al., 2014). Partnership and strategic willingness are the other factors in the change process. Strategic readiness refers to distinct plans for the digital transformation process to adopt financial products, while IT expertise is crucial for enhancing financial literacy (Nylm, 2015). Partnership readiness concerns partners’ transparency with information and financial knowledge to facilitate change adoption (Abrell et al., 2016). Khin and Ho (2019) argue that cultural, strategic, and partnership readiness are prerequisites for digital transformation. Hence, the study develops the following hypotheses.

H5: A positive relationship exists between contextual factors and the firm’s digital financial innovation.

H6: A positive relationship exists between contextual factors and the firm’s digital financial literacy.

Nexus of Digital Financial Innovations (DFI) with Financial Adaptability (FA) & Financial Robustness (FR)

Financial resilience is the ability to manage risk and adapt to financial shocks (Nkundabanyanga et al., 2020). Digital Financial Innovations (DFI) enable firms to adapt to unpredictable circumstances by altering their operating processes (Francalanza et al., 2017). The adaptability of corporations is considered an institution’s ability to maintain itself (Hannan & Freeman, 1977). COVID-19 has brought prominent challenges for firms due to risks, uncertainties, and disruptions. Institutes must swiftly adapt to new operational and strategic approaches, as they did during COVID-19 (Huang et al., 2020). Through electronic means, a cybernetic system of financial flows is created by digital financial technologies, which ensure the steady flow of information and transactions and, therefore, boost the competency of the financial system Karimi and Walter (2015) and its survival in adverse situations (Acquaah et al., 2011). FR is a firm’s ability to swiftly adapt to the varying dynamics of the market (Zhan &

Zeng, 2012). In a financial system, robustness gauges its resilience to shocks during periods of financial unpredictability and risk. The available literature does not fully explore the connection between FR and DFI. Hence, the study develops the following hypotheses.

H7: A positive relationship exists between Digital financial innovation and the financial adaptability of the firm.

H8: A positive relationship exists between Digital financial innovation and the financial robustness of the firm.

Nexus of Digital Financial Literacy (DFL) with Financial Adaptability & Financial Robustness

Researchers have observed that financial literacy in different countries strengthens financial resilience (De Beckker et al., 2019). However, firms and countries have accelerated efforts to build digital financial literacy to enhance financial resilience and cope with adverse economic shocks (A. C. Lyons & Kass-Hanna, 2021). Fernandes et al. (2014) examined more than 200 articles, and Kaiser and Menkhoff (2017) reviewed 126 experimental studies. The authors found a strong positive connection between financial literacy and resilience. Similarly, from Asian and African economies, Morgan and Long (2020) find a positive association between financial literacy and financial adaptability, while A. C. Lyons and Kass-Hanna (2021) find the same between financial literacy and financial robustness. Hence, the study develops the following hypotheses.

H9: A positive relationship exists between Digital financial literacy and the financial robustness of the firm.

H10: A positive relationship exists between Digital financial literacy and the firm's financial adaptability.

Nexus between Financial Inclusion (FI), Organisational Readiness Theory, and Digital Financial Innovations (DFI)

The evolution of financial instruments and services is mainly viewed as financial innovation Misati (2010), while the ability to access and use financial services is known as financial inclusion. Organisational readiness and firms' use of financial innovations (mobile banking, agency banking, credit, and debit cards) enhance financial services Ekmekcioglu and Barak (2012) and increase financial inclusion levels. Conversely, inadequate resource readiness Kama and Adigun (2013) leads to poor financial inclusion. Financial innovation promotes financing expansion Beck et al. (2016), trade efficiency, and easy access to financial services (Qamruzzaman & Wei, 2018). Change Efficacy (CE) enhances financial innovation-led inclusion (Chipeta & Muthinja, 2018). Hence, the study develops the following hypotheses.

H11 (a, b, c): The relationship between Organisational Readiness (CV, CE & CF) and DFI is positively moderated by Financial Inclusion.

Nexus between Financial Inclusion (FI), Organisational Readiness Theory, and Digital Financial Literacy (DFL)

Financial inclusion enhances financial stability Han and Melecky (2013), while financial literacy enhances participation and financial inclusion (de Bassa Scheresberg, 2013). Grohmann et al. (2018) find the same for developing countries, and Morgan and Long (2020) find this for Cambodia and Vietnam. Cheluget (2018) establish that financial literacy, financial innovation, and financial inclusion accounted for 79% of the changes in financial resilience. Organisational readiness to change through available resources Fuller et al. (2007), adoption of technology and commitment to change Abu-Assi et al. (2014), and Financial Literacy Cheluget (2018) enhance financial inclusion. Byegon et al. (2019) finds that financial innovation enhances the relationship between organisations' strategies and financial inclusion. Hence, the study develops the following hypotheses.

H12 (a, b, c): The relationship between Organisational Readiness (CV, CE & CF) and DFL is positively moderated by Financial Inclusion.

Nexus between Digital Business Strategy (DBS), Organisational Readiness Theory, and Digital Financial Innovations (DFI)

Organisations are seeking help to cope with a changed business scenario by gaining an understanding of DBS Kane et al. (2015), the customer Plummer et al. (2014), and market behaviour (Mainardi & Vollmer, 2015). A proper supporting organisational setup is required to actively use digital technologies. Appropriate firms' structure, lean processes, skilled workforce, flexible work practices, open communication, and supply IT infrastructure are the components (Agrifoglio et al., 2017) of organisational readiness for active use of innovative digital technology Gürdür et al. (2019) and ultimately, the moderating effect of DBS improves financial performance. However, the successful implementation of technologies will be influenced by the availability of related organisational resources. Appropriate usage of intangible and tangible assets shapes the firm's organisational readiness and DBS (business-IT alignment) (Sambamurthy et al., 2003).

Hence, the study develops the following hypotheses.

H13 (a, b, c): DBS alignment positively moderates the relationship between Organisational Readiness (CV, CE & CF) and DFI.

Nexus between Digital Business Strategy (DBS), Organisational Readiness Theory, and Digital Financial Literacy (DFL)

The DBS concepts guide the application of digital technology in business strategies (Setia et al., 2013; Zainol et al., 2022). The literature shows a strong positive association between digital strategy and business competency (Nambisan et al., 2017). Aligning DBS and IT is necessary for organisational performance and competitiveness (Kahre et al., 2017). Organisational readiness for change improves organisational performance by orchestrating resources and aligning business and IT to adopt and use digital technologies (Frishammar et al., 2018). The firm's performance

improves when the business strategy aligns with DFIS in ORT. Financial Literacy enhances the use of new digital technologies, while a lack of financial literacy has restricted the use of financial services. Connecting technology with financial products is crucial to enhancing financial literacy and financial product accessibility. In contrast, using technology and financial literacy in SME practices enhances economic development.

H14 (a, b, c): The relationship between Organisational Readiness (CV, CE & CF) and DFL is positively moderated by DBS alignment.

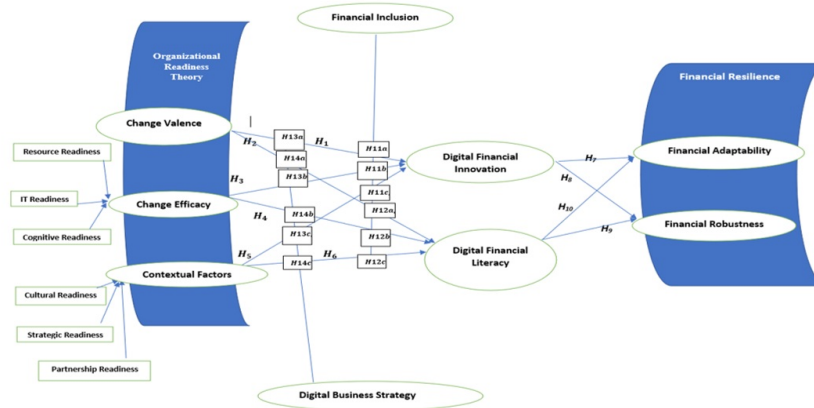


Fig. 1 Theoretical model exhibiting the nexus of variables (Source: Author's work)

Data and demographics

The study collects data from a specific target group: Those with experience and knowledge about strategy, scarcity, and utilisation of resources. Therefore, a purposive sampling technique is used to select respondents Maspaitella et al. (2018) with relevant characteristics to meet the research objectives (Palinkas et al., 2015). The purposive sampling technique is superior to simple random sampling, where respondents are often unaware of the specific knowledge (Patton, 2015), necessary experience and background of the topic (Tongco, 2007). Similarly, stratified sampling involves selecting a specific target subgroup of respondents. However, it may lead to the selection of irrelevant respondents. In contrast, the purposive sampling technique helps select respondents with particular and professional experience, thus avoiding wasting time and resources and is superior to other sampling methods (Teddle & Yu, 2007). Moreover, the purposive sampling technique is more flexible than probability-based sampling, which strictly adheres to predefined procedures (Etikan et al., 2016).

The services industry was chosen because respondents in this sector have expertise in strategy, finance, IT, and related areas. First, we selected respondents from senior and managerial-level employees across the financial, banking, airline, healthcare, hotel, telecom, education, and logistics industries on LinkedIn. Secondly, IT experts working in CDT (Centre of Digital Transformation) and PBIT (Punjab Information Technology Board) were selected as respondents. The board is an autonomous body that promotes an innovative economy, modern governance, and digital financial literacy. The PBIT has established the "Arfa Software and Technology Park" in the city of Lahore (a city with a vibrant IT industry) in Pakistan. Earlier, its name was Lahore Technology Park, but it was renamed to honour the memory of the late Arfa Karim. The Park promotes the IT vision of businesses and the public. The business's integral strategic pillars are broader digital diversification, transformation, and digital economic development, and Pakistan is adopting measures to compete with neighbouring Asian countries. Thirdly, respondents were selected from mature and pioneering companies involved in digital transformation and innovation. The list of companies was obtained from the Federal Bureau of Statistics. We developed a list of top and middle-level managers across strategy, operations, finance, and IT. When the study's purpose was briefly explained over the phone, 710 respondents agreed to participate. The questionnaire was distributed via Google Surveys in May-June 2023. Finally, 490 usable responses generated a response rate of 69%. The respondents believed they knew about the organisation's digital innovation, strategic position, and performance. The data is available from the authors and will be available on demand. Table I indicates that around 63% of respondents are in middle-level management, while the remaining 37% are in top-level management and are related to resilience. Most respondents possess 10 to 15 years of relevant experience, while most firms have a sales volume of up to 1 million USD.

Because it is non-random, purposive sampling is prone to bias. The study employs several control mechanisms to mitigate biases and enhance its generalizability, reliability, and validity. As discussed earlier, the study selects participants who have specific knowledge and are well-informed about the current study's purpose. Thus, we reduce the risk of arbitrary or subjective selection biases. Moreover, respondents agreed to participate in brief phone calls to elaborate on the study's purpose. Therefore, we reduce the risk of unconscious biases. Moreover, ethical considerations have been addressed (see Instrument for data collection), and questionnaires were initially distributed to a few participants (see Biases (non-response & common method bias)) to avoid biases.

Methodology

Instrument for data collection

Appendix A presents the different constructs adopted from the prevailing literature. All the constructs are reflective except organisational readiness, which is specified as formative. Data are collected using a two-section online questionnaire on a Likert scale (see Appendix A). The questionnaire preamble includes an ethical statement covering the respondent's consent, confidentiality, and anonymity. When purposive sampling is employed, it is paramount to address ethical considerations when researching respondents (Bryman et al., 2012). The current study has carefully reviewed the questionnaire for potential ethical issues, such as confidentiality, informed consent, and risks to respondents. In the questionnaire, we informed participants about sampling methods, potential risks, strategies to mitigate these risks, and data collection procedures, and we also ensured that the researchers adhered to ethical standards. We also informed them of the nature and purpose of the survey and that can withdraw from the survey at any time. Finally, we ensured that the participants participated voluntarily, without any pressure. Beauchamp and Childress (2019) argue that informed consent is necessary when using purposive sampling because any information could make the respondents vulnerable. Moreover, we ensured that the respondents' anonymity and confidentiality were protected, and that the information was stored carefully, as described. We also meaningfully constructed the questionnaire to avoid cultural and community norms.

Section 1 of the questionnaire exhibits general information (i.e., department, management position, type of organisation, and experience). The theory of organisational readiness contains seven formative components [clustered into three groups: contextual factors, change efficacy, and change valence as suggested by Lokuge et al. (2019)] presented in Part 1 of section 2 of the questionnaire (see Appendix A). Regarding reflective constructs, Financial Inclusion is covered with five items adapted from Le et al. (2020), presented in Part 2 of section 2. Digital technology-business strategic alignment is covered with four questions adapted from Li et al. (2021), see Part 3 of section 2. Similarly, we adapt seven items from Khin and Ho (2019) to construct Digital Finance Innovation (DFI); see Part 4 of section 2.

In Part 5 of section 2, we construct an index for digital financial literacy comprising three dimensions and 15 indicators (adopted from A. Lyons & Kass-Hanna, 2021): 1) access to mobile technology (i.e., owns a mobile phone or a smartphone, 2) mobile phone proficiency "(i.e. uses the mobile phone to send or receive calls, sends or receives text messages, sends or receives photos, browses or uses the Internet, downloads music, videos or games, makes financial transactions, or access social networking sites)", 3) mobile money proficiency "(i.e., opens a mobile money menu, finds particular menu options, initiates a transaction, completes a transaction, corrects an error, or reverses or cancels a transaction)". We form Financial Resilience by adopting two different constructs: financial adaptability (four items) and financial robustness (five items) (see Nkundabanyanga et al., 2020).

Table II

Presents an Evaluation of the measurement model. Tick (✓) represents the item decision to retain the items, and F and G present Formative and Global, respectively. BCa CI denotes Bias Corrected and Accelerated Bootstrap, CI gives Confidence Interval, while VIF, HOC, and LOC represent Variance Inflation Factor, Higher Order Components, and Lower Order Components, respectively. The Path coefficients are given by β .

Panel A: First-order formative measurement model assessment									
Items	Convergent validity	VIF	Outer weights	t-Value	95% BCa CI	Outer loadings	t-Value	95% BCa CI11	Item decision
CV1	β between CV_F and CV_G = 0.793	1.631	0.54923	2.026	[-0.065; 0.415]	0.894	6.5021	[0.462; 0.841]	✓
CV2		1.702	0.01723	3.763	[-0.596; -0.037]	0.681	4.1381	[0.078; 0.684]	✓
CV3		1.449	0.30423	9.011	[0.790; 1.233]	0.782	31.435	[0.815; 0.884]	✓
RR1	β between RR_F and RR_G = 0.801	1.212	0.73123	1.002	[0.313; 0.655]	0.983	14.024	[0.480; 0.843]	✓
RR2		1.193	0.39623	5.245	[-0.083; 0.342]	0.605	4.687	[0.275; 0.573]	✓
RR3		1.375	0.81023	11.35	[0.718; 0.63]	0.807	27.477	[0.786; 0.845]	✓
IT1	β between IT_F and IT_G = 0.837	1.434	0.54223	4.012	[0.062; 0.534]	0.874	14.200	[0.710; 0.730]	✓
IT2		1.440	0.59523	5.364	[0.103; 0.581]	0.723	12.558	[0.601; 0.792]	✓
IT3		1.580	0.98023	10.23	[0.639; 0.976]	0.736	33.728	[0.967; 0.971]	✓
CGR1	β between CG_F and CG_G = 0.819	1.001	0.01377	3.462	[-0.598; -0.036]	0.263	1.3971	[-0.482; 0.283]	✓
CGR2		1.628	0.82823	1.066	[0.281; 0.756]	0.975	5.763	[0.652; 0.853]	✓
CGR3		1.519	0.76023	6.199	[0.529; 0.832]	0.661	9.502	[0.518; 0.834]	✓
CR1	β between CR_F and CR_G = 0.826	1.617	0.57923	1.172	[0.230; 0.491]	0.593	29.867	[0.774; 0.793]	✓
CR2		1.350	0.67323	7.522	[0.356; 0.589]	0.715	27.528	[0.676; 0.780]	✓

Cont...

Panel A: First-order formative measurement model assessment									
Items	Convergent validity	VIF	Outer weights	t-Value	95% BCa CI	Outer loadings	t-Value	95% BCa CI11	Item decision
CR3	β between SR_F and SR_G = 0.857	2.001	0.84923	9.345	[0.519; 0.745]	0.826	59.000	[0.785; 0.826]	✓
SR1		1.721	0.55323	6.424	[0.278; 0.489]	0.643	21.103	[0.726; 0.809]	✓
SR2		1.183	0.88923	15.47	[0.391; 0.781]	0.798	48.323	[0.756; 0.669]	✓
SR3	β between PR_F and PR_G = 0.868	1.629	0.69323	10.71	[0.367; 0.589]	0.612	30.238	[0.834; 0.951]	✓
PR1		1.419	0.70123	12.32	[0.375; 0.535]	0.728	30.409	[0.803; 0.736]	✓
PR2		1.831	0.81623	9.128	[0.518; 0.629]	0.894	44.506	[0.726; 0.869]	✓
PR3		1.813	0.59723	6.477	[0.231; 0.450]	0.608	27.516	[0.861; 0.762]	✓

(Source: Author's own work)

Panel B: Second-order formative measurement model assessment						
HOC	LOC	Convergent validity	VIF	Outer weights	t-Value	95% BCa CI11
CE	RR	β between CE_F and CE_G = 0.782	1.393	0.623	19.578	[0.648; 0.712]
	IT		1.480	0.523	18.835	[0.526; 0.628]
	CG		1.101	0.287	8.294	[0.381; 0.529]
CF	CR	β between CF_F and CF_G = 0.945	3.261	0.299	20.762	[0.420; 0.479]
	SR		3.008	0.396	24.752	[0.594; 0.502]
	PR		2.281	0.402	25.259	[0.462; 0.633]

Method for measurement

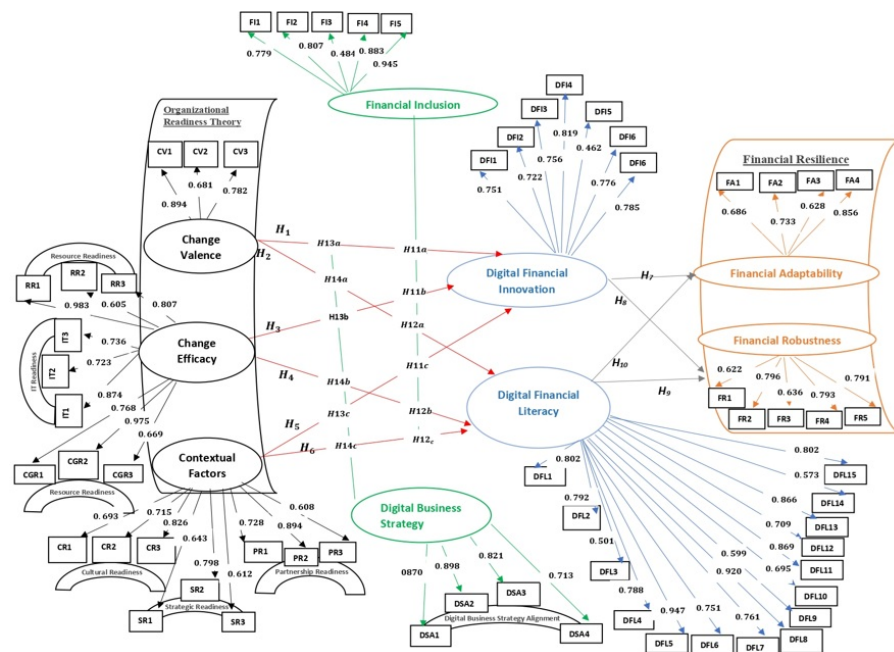


Fig. 2 Measurement model (Source: Author's own work)

We use the PLS-SEM (partial Least Squares Structural Equation Modelling) approach to analyse the composite-based data (Ringle et al., 2015). The method is superior for mediator estimation (Nitzl et al., 2016), suitable and robust for the prediction of formative-complex constructs (Sharma et al., 2021), can overcome the limitations of the PROCESS macro (this regression does not consider measurement errors) and has been adopted in many recent studies in the management field (Saghiri & Mirzabeiki, 2021).

Compared to other methods, PLS-SEM is superior to factor-based SEM Hair Jr and Sarstedt (2019) and is the most popular model for analysing complex models comprising multiple relations, indicators, and constructs (Hair et al., 2011). Compared to regression and CB-SEM, the PLS-SEM

allows simultaneous modelling of formative and reflective constructs (Hair Jr et al., 2017). PLS-SEM is the most popular and efficiently handles limited data, while CB-SEM requires large data sets (Rigdon et al., 2017). Moreover, CB-SEM strictly adheres to the assumption of normality, while PLS-SEM is independent of such assumptions and is best suited for skewed and non-normal distributions (Hair et al., 2012). PLS-SEM offers flexible model specifications, accounts for error measurements, and considers the entire model while estimating parameters (Sarstedt et al., 2020). The model used in our study is a “formative-formative hierarchical component model with moderated mediation”, which is complex; therefore, we use PLS-SEM to justify the absence of distributional assumptions. The study utilised the “SmartPLS 4”, a standalone software explicitly designed to apply PLS-SEM. The mediation and moderation analyses are integrated within “SmartPLS 4”. The study applies a two-stage technique to investigate first- and second-order formative constructions (CV, CE, CF) of organisational readiness theory. Lastly, based on the suggestions of Hair Jr and Sarstedt (2019), the study adopts a bifactor process: first, the evaluation of both reflective and formative constructs; second, the measurement of the structural model.

Results and Analysis

Valuation of measurement model (Formative & reflective)

A three-step method suggested by Sarstedt et al. (2019) is adopted to evaluate the 1st- and 2nd-order formative-construct measurement models. In the initial step, global single-factor and redundancy analyses are used to assess the construct criterion and the convergent validity of lower- and higher-level latent variables (Cheah et al., 2018). It is clear from Table II that convergent validity is fulfilled because threshold values (i.e. 0.7) are less than the values of path coefficients (Cheah et al., 2018; Hair Jr et al., 2017). The study uses VIF (variance inflation factor) to address potential collinearity among formative predictors; values must be below 5 Hair Jr and Sarstedt (2019) or, preferably, below 3.3 (Diamantopoulos & Siguaw, 2006). It is clear from the first- and second-order measurement models of inner VIFs that multicollinearity does not occur among the variables. A bootstrap method, namely BCa (Bias-Corrected and Accelerated), is employed to estimate the significance of the outer weights. For this purpose, a bootstrap sample of size 10,000 is used, as suggested by Sarstedt et al. (2019). Except for RR1, CGR2, and CR1, we find significant outer weights, but the loadings of these three insignificant weights are statistically significant, so we retain all three items (RR1, CG2, and CR1).

After measuring the formative model, we measure the reflective model. To assess the quality of the measurement model, the study employs discriminant validity criteria along with convergent and consistency (Hair Jr & Sarstedt, 2019). The Average Variance Extracted (AVE) and outer loadings are examined for convergent validity. Hair Jr et al. (2017) recommend that outer loading be higher than 0.708. However, remove the items with loadings ranging from 0.40 to 0.70 only if eliminating them increases the AVE or CR (composite reliability) above the threshold values. Hence, the study excludes FI3, DF15, DFL3, DFL9, and DFL14, but retains all other items with loadings below 0.708, as their exclusion does not result in any substantive change in the constructs' CR or AVE. The measurement model is regenerated after removing non-compliant items. Panel A of Table III clearly shows that convergent validity and internal consistency reliability are acceptable and satisfactory, as CR, Cronbach's alpha (α), and AVE values are above the required threshold values 0.7 (for CR and α) and 0.5 (for AVE) (Hair Jr & Sarstedt, 2019). The study establishes discriminant validity (Panel B of Table III); each construct has a higher square root of its AVE than its correlations with all other constructs, as suggested by (Fornell & Larcker, 1981). Moreover, HTMT (heterotrait-monotrait) values are less than 0.90 (threshold), and the distinctiveness of the constructs is also verified, as the bootstrapped confidence interval does not contain the value “one” (Henseler et al., 2015). For a better understanding, see Figure 2.

Table III

Assessment of “Reflective Measurement Model”. The Indicator's Reliability and Validity are given in Panel A, while Panel B presents Discriminant Validity. CR, FL, and CI represent the Composite Reliability, Factor Loadings, and Confidence Intervals, respectively. The average Variance Extracted is given by AVE, while α and Item Reliability give Cronbach's Alpha is represented by IR. The items to be retained are identified by $\checkmark$, while $\times$ means items are deleted.

Panel A: Validity and Reliability of Indicators'						
Items	Internal consistency reliability		Convergent validity		AVE	The decision to Retain or Delete Item
	CR	α	FL	IR		
FI1	0.8489	0.8119	0.779	0.666	0.646	$\checkmark$
FI2			0.807	0.715		$\checkmark$
FI3			0.484	0.299		$\times$
FI4			0.883	0.858		$\checkmark$
FI5			0.945	0.930		$\checkmark$
DF11	0.853	0.769	0.751	0.691	0.793	$\checkmark$
DF12			0.722	0.521		$\checkmark$
DF13			0.756	0.572		$\checkmark$
DF14			0.819	0.671		$\checkmark$
DF15			0.462	0.316		$\times$

Cont...

Panel A: Validity and Reliability of Indicators'						
Items	CR	α	FL	IR	AVE	
DF16			0.776	0.602		✓
DF17			0.785	0.715		✓
DFL1	0.851	0.738	0.848	0.719	0.655	✓
DFL2			0.792	0.627		✓
DFL3			0.501	0.438		✗
DFL4			0.788	0.621		✓
DFL5			0.947	.9229		✓
DFL6			0.751	0.533		✓
DFL7			0.761	0.546		✓
DFL8			0.920	0.790		✓
DFL9			0.599	0.451		✗
DFL10			0.695	0.460		✓
DFL11			0.869	0.664		✓
DFL12			0.709	0.477		✓
DFL13			0.866	0.702		✓
DFL14			0.573	0.430		✗
DFL15			0.802	0.792		✓
DSA1	0.939	0.902	0.870	0.757	0.837	✓
DSA2			0.898	0.806		✓
DSA3			0.821	0.750		✓
DSA4			0.713	0.845		✓
FA1	0.838	0.758	0.686	0.498	0.628	✓
FA2			0.733	0.472		✓
FA3			0.628	0.818		✓
FA4			0.856	0.716		✓
FR1	0.847	0.775	0.622	0.587	0.671	✓
FR2			0.796	0.591		✓
FR3			0.636	0.404		✓
FR4			0.793	0.629		✓
FR5			0.791	0.626		✓

(Source: Author's own work)

Panel B: Discriminant Validity							
	FI	DFI	DFL	DSA	FA	FR	HTMT CI does not include 1
FI	0.803	0.689	0.681	0.679	0.712	0.782	YES
DFI	0.727	0.891	0.862	0.826	0.843	0.856	
DFL	0.709	0.705	0.809	0.676	0.822	0.695	
DSA	0.715	0.676	0.602	0.914	0.846	0.765	
FA	0.762	0.674	0.683	0.628	0.792	0.705	
FR	0.742	0.672	0.596	0.624	0.558	0.819	

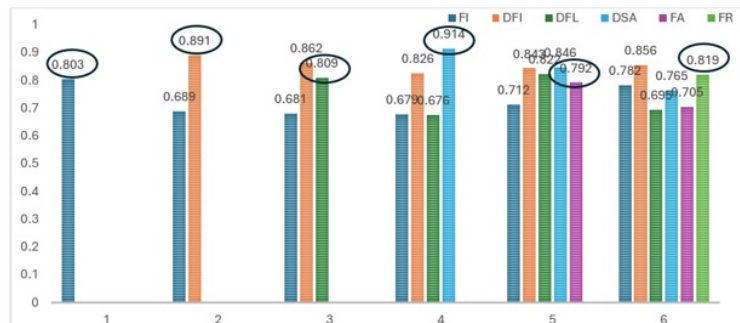


Fig. 3 Comparison of HTMT values with the square root of AVE (Source: Author's own work))

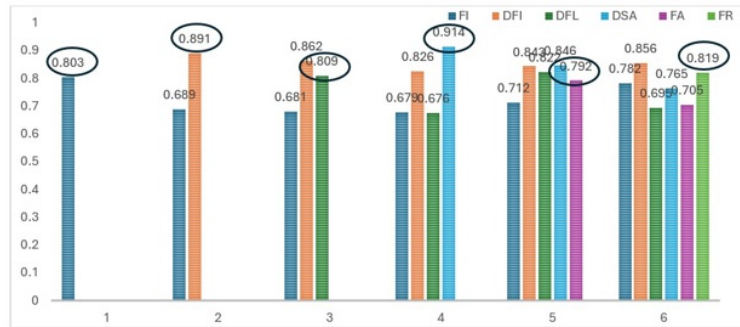


Fig. 4 Comparison of correlation values with the square root of AVE (Source: Author's own work)

Table IV

Corrections for CMV (common method variance) Pre-post values of path coefficients. *** $p < 0.001$, ** $p < 0.01$ and * $p < 0.05$.

Paths for Proposed Hypotheses	Pre-correction for CMB	Post correction for CMB (rmv = 0.107)
H1: CV → DFI	0.050	0.056
H3: CE → DFI	0.178*	0.167*
H5: CF → DFI	0.501***	0.492***
H7: DFI → FA	0.745***	0.714***
H8: DFI → FR	0.712***	0.688***
H11a: CV*FI → DFI	0.067	0.059
H11b CE*FI → DFI	0.004	0.011
H11c CF*FI → DFI	-0.046	-0.034
H13a: CV*DBS → DFI	0.076	0.068
H13b CE*DBS → DFI	0.012	0.025
H13c CF*DBS → DFI	-0.045	-0.037
H2: CV → DFL	0.068	0.055
H4: CE → DFL	0.227*	0.19*
H6: CF → DFL	0.469***	0.424***
H9: DFL → FR	0.720***	0.699***
H10: DFL → FA	0.675***	0.651***
H12a: CV*FI → DFL	0.071	0.054
H12b CE*FI → DFL	0.012	0.018
H12c CF*FI → DFL	-0.041	-0.031
H14a: CV*DBS → DFL	0.055	0.039
H14b CE*DBS → DFL	0.017	0.009
H14c CF*DBS → DFL	-0.066	-0.057

(Source: Authors own work)

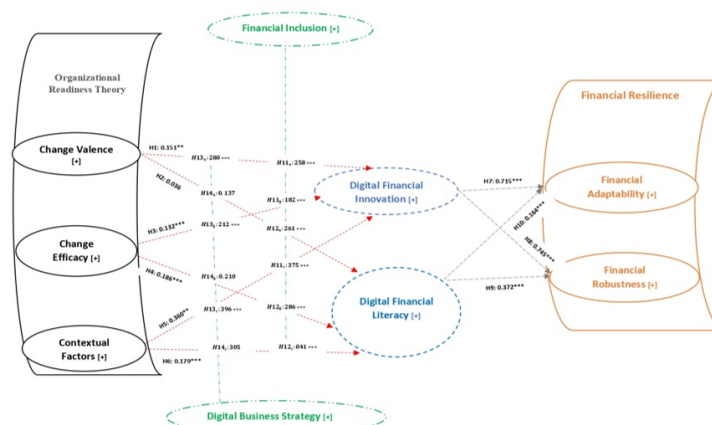


Fig. 5 Structural model assessment (Source: Author's own work)

Biases (non-response & common method bias)

CMB (Common Method Biases) disturbs the validity of outcomes (Malhotra et al., 2006). So, common method variance is mitigated by adopting different post-hoc and a priori actions (Podsakoff et al., 2003). First, to detect misunderstandings (caused by vocabulary or syntax) and ambiguities (caused by negative or positive wordings), the questionnaire is presented to 50 participants who are not part of the final sample, as suggested by Perneger et al. (2015). Secondly, we preserve the confidentiality and anonymity of participants as personal details are not collected from respondents. The study employs collinearity and the post hoc marker variable approaches to estimate the probability of common bias. According to Lindell and Brandt (2000), the first approach uses the weakest correlation between variables as a proxy for CMV (Common-Method-variance) see also (Papastathopoulos et al., 2020). Table Perneger2015 shows no significant change in path coefficients before and after correcting common technique biases. Based on the recommendations of Kock (2015), the study identifies the CMB through the collinearity test (VIFs-Variance Inflation Factors) for all constructs. It is observed that CMB is not a problem in the current data, as VIFs are below 5 (the cut-off Point), even though 1.074 to 3.307 is a more conservative threshold.

Table V

Structural model estimations, to estimate and specify the higher-order constructs, two-stage techniques and mode B are used (Sarstedt et al., 2019). (Source: Author's own work)

Hypotheses and paths	β	t-Value	95% BCa CI	Status
Mediating Effects				
Relationship between Organisational Readiness Theory (CV, CE, CF) and Digital Financial Innovation (DFI)				
H1 (+): CV $\rightarrow$ DFI	0.151**	2.518	[0.033; 0.270]	Supported
H3 (+): CE $\rightarrow$ DFI	0.132***	4.215	[0.069; 0.196]	Supported
H5 (+): CF $\rightarrow$ DFI	0.360**	2.002	[0.007; 0.602]	Supported
Relationship between Digital Financial Innovation (DFI) and Financial Resilience (FA, FR)				
H7 (+): DFI $\rightarrow$ FA	0.715***	18.845	[0.541; 0.723]	Supported
H8 (+): DFI $\rightarrow$ FR	0.745***	22.340	[0.580; 0.739]	Supported
Relationship between Organisational Readiness Theory (CV, CE, CF) and Digital Financial Literacy (DFL)				
H2 (+): CV $\rightarrow$ DFL	0.036	0.113	[-0.368; 0.652]	Not Supported
H4 (+): CE $\rightarrow$ DFL	0.186***	4.74	[0.110; 0.258]	Supported
H6 (+): CF $\rightarrow$ DFL	0.179***	5.583	[0.102; 0.239]	Supported
Relationship between Digital Financial Literacy (DFL) and Financial Resilience (FA, FR)				
H9 (+): DFL $\rightarrow$ FR	0.372***	19.64	[0.335; 0.395]	Supported
H10 (+): DFL $\rightarrow$ FA	0.164***	25.07	[0.153; 0.188]	Supported
Moderating Effects				
Moderating effect of Financial Inclusion on the relationship between Organisational Readiness Theory (CV, CE, CF) and Digital Financial Innovation (DFI)				
H11a (+): CV*FI $\rightarrow$ DFI	0.258***	4.895	[0.150; 0.357]	Supported
H11b (+): CE*FI $\rightarrow$ DFI	0.182***	4.285	[0.103; 0.277]	Supported
H11c (+): CF*FI $\rightarrow$ DFI	0.375***	4.831	[0.215; 0.521]	Supported
Moderating effect of Digital Business Strategy on the relationship between Organisational Readiness Theory (CV, CE, CF) and Digital Financial Innovation (DFI)				
H13a (+): CV*DBS $\rightarrow$ DFI	0.280***	3.10	[0.105; 0.456]	Supported
H13b (+): CE*DBS $\rightarrow$ DFI	0.212***	4.975	[0.131; 0.290]	Supported
H13c (+): CF*DBS $\rightarrow$ DFI	0.396***	4.962	[0.243; 0.554]	Supported
Moderating effect of Financial Inclusion on the relationship between Organisational Readiness Theory (CV, CE, CF) and Digital Financial Literacy (DFL)				
H12a (+): CV*FI $\rightarrow$ DFL	0.261***	3.149	[0.105; 0.210]	Supported
H12b (+): CE*FI $\rightarrow$ DFL	0.286**	2.190	[0.041; 0.437]	Supported
H12c(+): CF*FI $\rightarrow$ DFL	0.041***	3.468	[0.028; 0.069]	Supported
Moderating effect of Digital Business Strategy on the relationship between Organisational Readiness Theory (CV, CE, CF) and Digital Financial Literacy (DFL)				
H14a (+): CV*DBS $\rightarrow$ DFL	0.137	0.299	[-0.085; 0.082]	Not Supported
H14b (+): CE*DBS $\rightarrow$ DFL	0.210	0.415	[-0.117; 0.079]	Not Supported
H14c(+): CF*DBS $\rightarrow$ DFL	0.305	1.471	[-0.147; 0.103]	Not Supported

Coefficient of determination			
Digital Financial Innovation as Mediator		Digital Financial Literacy as a Mediator	
R^2 DFI	0.66	R^2 DFL	0.70
R^2 FA	0.51	R^2 FA	0.55
R^2 FR	0.46	R^2 FR	0.52
Effect size			
ORT DFI Fin-Resl		ORT DFI Fin-Resl	
f^2 CV on DFI	0.760	f^2 CV on DFL	0.738
f^2 CE on DFI	0.698	f^2 CE on DFL	0.665
f^2 CF on DFI	0.742	f^2 CF on DFL	0.009
f^2 DFI on FR	0.816	f^2 DFL on FR	0.769
f^2 DFI on FA	0.927	f^2 DFL on FA	0.902
Predictive relevance			
Q^2 DFI	0.370	Q^2 DFL	0.416
Q^2 FA	0.319	Q^2 FA	0.284
Q^2 FR	0.257	Q^2 FR	0.228

Nonresponse bias is examined by comparing the early and late responses received from respondents. We received only 89 (out of 490) questionnaires after the deadline, yielding insignificant mean differences between the two groups ($\alpha = 0.05$). Hence, systematic nonresponse bias is not a problem in the study.

Structural model assessment

Digital financial innovation as mediator

The study examines collinearity before hypothesis testing; all values of VIF are below the cutoff value of 3.3 (Diamantopoulos & Siguaw, 2006). Hence, the model under study is not affected by collinearity. R^2 (coefficient of determination) examines the model's predictive power. Hair et al. (2011) suggested that values of 0.75, 0.50, and 0.25 are interpreted as strong, moderate, and weak, respectively. We observe R^2 values of 66 % for digital financial innovation, 51 % for financial adaptability, and 46 % for financial robustness. The values indicate that digital financial innovations are enough to explain a firm's financial resilience change (See Table V).

For the structural model relationship, the effect sizes (f^2) reveal that Organisational Readiness theory (CF, CE, and CV) substantially affects DFI. At the same time, DFI strongly affects Financial Resilience (FR & FA). A blind-folding procedure also examines model predictive relevance (Q^2). The predictive power of the path model is strong, as values are higher than zero [as suggested by Evermann and Tate (2016)] for all endogenous constructs. As far as the structural model is concerned, research hypotheses H1, H3, H5, H7, and H8 are supported as the study finds positive-significant impacts of change valence ($\beta = 0.151, p < 0.05$), Change efficacy ($\beta = 0.132, p < 0.05$) and Contextual factors ($\beta = 0.360, p < 0.05$) on DFI, while the same impact of DFI on Financial Resilience (DFI $\rightarrow$ FA: $\beta = 0.715, p < 0.05$ and DFI $\rightarrow$ FR: $\beta = 0.745, p < 0.05$). Hence, the mediating role of DFI between organisational readiness and financial resilience is verified (See Table V).

Digital financial literacy as mediator

Based on the criteria discussed in the first paragraph of section 5.3.1 (Digital financial innovation as mediator), we observe R^2 values of 70 % for digital financial literacy, 55 % for financial adaptability, 52 % for financial robustness, and impact sizes (f^2) reveal that organisational readiness theory (CF, CE, and CV) has a moderate impact on digital financial literacy. In contrast, digital financial literacy strongly affects financial resilience (FR & FA). The predictive power of the path model is verified as the (Q^2) values are higher than zero for all endogenous constructs. For model analysis, research hypotheses H4, H6, H9, and H10 are supported as the study finds positive and significant impacts of change efficacy ($\beta = 0.186, p < 0.05$) and contextual factors ($\beta = 0.179, p < 0.05$) on Digital Financial Literacy (DFL). In contrast, the study observes the same impact of DFL on financial resilience (DFL $\rightarrow$ FA: $\beta = 0.164, p < 0.05$; DFL $\rightarrow$ FR: $\beta = 0.372, p < 0.05$), but finds no significant impact of change valence on DFL, so H2 is rejected. However, the mediating role of DFL between organisational readiness and financial resilience is verified (See Table V).

Financial inclusion and digital business strategy as moderators on the relationship between Organisational Readiness Theory (ORT) and Digital Financial Innovations (DFI)

Financial Inclusion significantly moderates (enhances) the relationship between organisational readiness theory and Digital Financial Innovation as (CV*FI $\rightarrow$ DFI: $\beta = 0.258, p < 0.05$, CE*FI $\rightarrow$ DFI: $\beta = 0.182, p < 0.05$ and CF*FI $\rightarrow$ DFI: $\beta = 0.375, p < 0.05$), Hence, H11 (a, b, and c) are also accepted. Similarly, the study supports the moderating effect of Digital Business strategy (DBS) and accepts H13 (a, b, and c) because DBS enhances the relationship between Organisational readiness and Digital Financial Innovation (CV*DBS $\rightarrow$ DFI: $\beta = 0.280, p < 0.05$, CE*DBS $\rightarrow$ DFI: $\beta = 0.212, p < 0.05$, CF*DBS $\rightarrow$ DFI: $\beta = 0.396, p < 0.05$). Hence, the moderating role of financial inclusion and digital business strategy is verified (See Table V).

Financial inclusion and digital business strategy as moderators on the relationship between Organisational Readiness Theory (ORT) and Digital Financial Literacy (DFL)

Financial Inclusion significantly moderates (enhances) the relationship between organisational readiness theory and digital financial literacy ($CV*FI \rightarrow DFL: \beta = 0.261, p < 0.05$; $CE*FI \rightarrow DFL: \beta = 0.286, p < 0.05$; and $CF*FI \rightarrow DFL: \beta = 0.041, p < 0.05$). Hence, H12 (a, b, c) are also accepted. Surprisingly, the study finds that all three moderations (via Digital Business Strategy) between organisational readiness and digital financial literacy are insignificant. Hence, the study does not support H14 (a, b, and c) (See Table V).

Conclusion and Discussion

Nexus of DFI and DFL with Organisational Readiness (ORT)

DFI and DFL improve Financial Resilience by providing risk management, accuracy, and convenience to all stakeholders Klapper and Lusardi (2020) and Wang et al. (2021), thereby leading to organisational success. However, firms' digital transformation is required to realise DFI and DFL successfully. Thus, it is necessary to review the business strategy, model, design process, operations, and the firm's values (Balakrishnan & Das, 2020). We find a positive relationship between ORT (CV, CE, CF) and DFI; H1, H3, and H5 are supported. Researchers Chwiłkowska-Kubala et al. (2023), Hussain and Papastathopoulos (2022), Lokuge et al. (2019), and Mikalef and Krogstie (2020) report similar findings, indicating that organisational readiness plays a vital role in enhancing digital transformation and digital financial innovation. Similarly, we find a significant positive impact of organisational readiness factors (i.e., change efficacy and contextual factors) on DFL. Hence, H4 and H6 are also supported. The reason for these findings may be that the service industry in Pakistan is sufficiently flexible and adaptable to adopt DFI and DFL, leveraging its resources, IT infrastructure, and mindsets. Nevertheless, change valence has an insignificant impact on DFL, so H2 has been rejected. The motivation and empowerment of employees are measured by changes in the valence of tasks like DFL, which makes the results seem counterintuitive. Feelings of low commitment to learning financial knowledge and low empowerment in decision-making regarding innovations may cause the rejection of H2. The insignificant impact of change valence on DFL is possibly because that firms and employees may perceive the digital financial transition negatively, or feel anxiety, fear, or a sense of complexity in using technology due to security concerns, a lack of trust in digital platforms, and limited access to digital tools. This lack of empowerment and commitment stems from the Pakistani context of the current study, where businesses are primarily family-owned and have a rigid culture. However, Pakistan has made significant investments in communication and information technology. Recent studies support the current study's findings. Sara et al. (2023) find that cultural readiness enhances financial literacy, while Sujana and Saputra (2020) observe a strong positive association between organisational culture readiness and financial literacy.

Nexus of DFI and DFL with financial resilience

We find a significant positive association between the DFI and Financial Resilience (i.e., financial adaptability and robustness). Thus, H7 and H8 are Supported. Robustness refers to rapid coping with dynamic market conditions Zhan and Zeng (2012), and adaptability refers to absorbing/adapting to financial shocks to achieve financial goals. Digital financial solutions provide timely, accurate information, thereby enhancing financial resilience. The current study results are similar to those of previous studies Nasiri et al. (2020) and Wang et al. (2021) where Sreenivasan and Suresh (2023) find that digital financial innovations should receive special attention to attain financial resilience and a competitive edge. Hypotheses H9 and H10 are also accepted; we find a significant, positive impact of digital financial literacy on financial resilience, and the results are similar to those of A. Lyons and Kass-Hanna (2021) and Klapper and Lusardi (2020), who also find that financial literacy enhances financial resilience. Moreover, Liu et al. (2024) found that financial literacy reduces risks, enhances financial resilience, and recovers from financial disturbances. Digital financial literacy enables quick, robust financial decisions that adapt to changing market conditions and uncertainties, thereby promoting financial resilience.

Moderating effect of FI on the Nexus (between ORT & DFI) and (between ORT & DFL)

The study finds a significant, positive moderating effect of Financial Inclusion on the relationship between organisational readiness and DFI. Hence, H11 (a, b, and c) are supported. The theoretical argument to support the moderating impact of financial inclusion is that the firms in Pakistan are enthusiastic about developing IT-based financial products (financial inclusion) and new IT-related business strategies. Domeher et al. (2022) find that financial inclusion significantly impacts the association between innovations and economic growth. On the other hand, the study again finds a substantial moderating impact of Financial Inclusion on the relationship between organisational readiness and DFL. Hence, H12 (a, b, and c) are also accepted. This is because organisational readiness (including culture, IT readiness, and resources) continually varies and requires digital financial literacy to achieve the firm's desired objectives. The findings are similar to those of the study of Morgan and Long (2020), who observed a strong connection between financial inclusion and financial literacy in achieving financial goals. Similarly, Pandey et al. (2022) find that

drivers of financial inclusion significantly enhance financial literacy, while Ibor (2023) observes strong positive connections between financial inclusion and financial literacy.

Moderating effect of DBS on Nexus (between ORT & DFI) and (between ORT & DFL)

The relationship between ORT and DFI is significantly moderated by digital business strategy. Therefore, H13 (a, b, and c) is accepted, and the results are similar to those of the study (Berman & Hagan, 2006). The strength of the relationship may be due to recent advances in digital technology, which empower the organisation's resources and readiness to pursue digital financial innovations (Coltman et al., 2015). However, the moderation effect of DBS is insignificant between ORT and DFL. Hence, H14 (a, b, and c) are rejected. It may be because of the misalignment of DBS between ORT and DFL for the following reasons: a) DBS is very institutionalised, and across industries and among firms; b) DBS does not spread differentiating factors to all progressive firms.

Implications for theory

The study results are novel as empirical literature on the nexus between organisational readiness and financial resilience through DFIs, DFL, Financial Inclusion, and DBS is scarce. The results show that organisational readiness determines DFI and DFL. Both DFI and DFL have a significant impact on financial resilience. Financial inclusion significantly moderates the relationship of ORT with both DFIs and DFL. However, the study does not find a significant relationship between change valence and DFL. Also, no moderating effect of DBS is observed in the relationship between ORT and DFL. This may be because of inconclusive results and debate on organisation readiness with digitalisation and financial resilience, or maybe in an underdeveloped country like Pakistan, firms are not flexible. Organisational readiness's strong relationship with DFIs and DFL improves financial performance Coltman et al. (2015) and financial resilience. DBS and financial inclusion align the need for organisational readiness with enhanced DFIs and DFL.

Implications for practice

The current research infers a few practical findings useful for practitioners: a) Organisational readiness, DFIs, and DFL improve financial resilience through adaptability and robustness, while financial inclusion and digital business strategy enhance this relationship. The constructs used in the study are very important to financial managers and businesses, while DFIs and DFL encourage the early collection of data and information for proactive, responsive decision-making. It is also inferred that financial inclusion and DBS require organisational readiness to retool firms' resources, reconfigure IT, change their strategic thinking, collaborate in cognition/culture, and appropriate practices/policies to facilitate change adoption. Given the significant impact of Digital financial literacy on financial resilience, firms should implement training programs to enhance employees' financial literacy. So that they can better deal with the financial health of firms and risks. Financially literate employees make informed decisions regarding forecasting, budgeting, and investing and cope with financial downturns, thus supporting strategic financial goals and avoiding cybersecurity threats. Governments and firms should introduce blockchain, advanced analytics and digital payment systems to enhance operational efficiency and customer experiences. Through digital financial innovations, governments can enable customers to get tailored financial products and services. Firms can implement digitalised financial services to monitor market conditions and financial transactions, thereby enhancing operational resilience. Firms should introduce new digital platforms for digital investments and online lending to generate additional revenues. Thus, digital financial innovations can contribute to financial resilience.

Limitations and future research

Like every research setting, the current study also has a few limitations: a) The data were collected mainly from the services industry in a developing country like Pakistan; b) the generalization of results needs to test the constructs of the study in other industries and countries; c) A longitudinal data set is more appropriate to analyze the impact of organisational readiness, DFIs, and DFL on financial resilience through financial innovations and DBS. Moreover, there is a need to implement digital technologies across sub-domains of business, so future research should develop new constructs of digitalisation and culture for multiple sub-domains of management. e) Although purposive sampling ensured knowledgeable respondents, relying on a single informant may introduce informant bias and may not fully reflect the organization's actual position. Future studies should use multiple informants and objective organizational data to enhance validity.

Firms in developed countries are rapidly adapting to Digital Financial Literacy (DFL) and Digital Financial Innovations (DFIs) to enhance financial resilience. Those countries use a strong strategic approach to integrate novel financial technologies while fostering the digital skills of customers and employees, thus ensuring financial resilience. Future researchers should investigate the impact of implementing such strategic approaches on the adaptation of digitalisation in developing economies. Moreover, firms in developed nations have introduced Fintech solutions, such as cryptocurrencies, blockchain, and mobile payments, into their operations. Such solutions offer secure, low-cost, and faster transactions. Future researchers should develop new models to adapt Fintech to developing economies and enhance financial resilience.

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Appendix

Table VI
Construct measurement, descriptive analysis

Constructs	Items	Description	Mean	SD
Part-1(Lokuge et al., 2019)				
Cultural Readiness	CR1	My organisation has a well-established way of sharing ideas and thoughts to engage with the IT portfolio for innovations.	4.201	0.771
	CR2	My organisation has a decentralized decision-making process that facilitates the engagement of all business areas to use the IT portfolio for innovations.	4.24	0.718
	CR3	My organisation takes reasonable risk assessment of engaging IT to facilitate innovations.	4.161	0.639
Global Item CR	CR-G	Overall, my organisation has a well-developed culture to engage with the IT portfolio for innovations.	4.638	0.482
Strategic Readiness	SR1	Our organisational strategic goals are clear to me when engaging the IT portfolio to facilitate innovations.	4.272	0.656
	SR2	Our organisational strategic goals are relevant to me when using the IT portfolio to facilitate innovations.	4.249	0.686
	SR3	I am well-aware of our organisational strategic goals communicated to me for using the IT portfolio to facilitate innovations.	4.426	0.655
Global Item SR	SR-G	Overall, our organisational strategic goals are clear, relevant, and well-communicated to me when engaging the IT portfolio to facilitate innovations.	4.736	0.512
Partnership Readiness	PR1	My organisation has a good relationship with the software vendors to facilitate innovations	4.281	0.598
	PR2	My organisation has a good relationship with the management consultants to facilitate innovations	4.426	0.697
	PR3	My organisation has a good relationship with our suppliers and vendors to facilitate innovations	4.274	0.609
Global Item PR	PR-G	Overall, my organisation has a good relationship with its partners to facilitate innovations.	4.756	0.498
Global Item Contextual Factors	CF-G	Overall, my organisation has a well-established culture, strategy, and partnerships to facilitate innovations	4.271	0.481
Resource Readiness	RR1	My organisation is flexible in allocating adequate financial resources necessary to innovate with the IT portfolio.	3.942	0.614
	RR2	My organisation is flexible in allocating adequate human resources necessary to innovate with the IT portfolio.	3.672	0.909
	RR3	My organisation is flexible in allocating adequate IT infrastructure resources necessary to innovate with the IT portfolio.	4.413	0.635
Global Item RR	RR-G	Overall, my organisation is flexible in allocating adequate resources necessary to innovate with the IT	4.706	0.472
IT Readiness	IT1	Enterprise system/s in my organisation is stable, up-to-date, and reliable.	4.161	0.641
	IT2	I have access to a range of new technologies like cloud, mobile, social media, and big data analytics available to facilitate innovations.	4.311	0.601
	IT3	Our IT infrastructure is stable, up-to-date, and reliable to facilitate innovations.	4.088	0.617
Global Item IT	IT-G	Overall, IT and IS in my organisation are stable, up-to-date, available, and reliable to facilitate innovations.	4.606	0.473
Cognitive Readiness	CG1	Our staff members have the appropriate knowledge (i.e., technical, business process, and organisational) to facilitate innovations.	4.383	0.573
	CG2	Our staff members have the appropriate skills to facilitate innovations.	4.381	0.778
	CG3	Our staff members have the appropriate adaptability to facilitate innovation.	4.345	0.662
Global Item CG	CG-G	Overall, our staff members have the appropriate skills to facilitate innovation.	5.031	0.367
Global Item Change Efficacy	CE-G	Overall, my organisation has the necessary resources, technologies, and staff capabilities to facilitate innovations	4.188	0.179
Change Valence	CV1	Our staff members have the right attitudes that facilitate innovations.	3.795	0.685
	CV2	Our staff members are motivated to facilitate innovations.	3.688	0.853
	CV3	Our staff members are empowered to make decisions that facilitate innovations.	3.949	0.643
Global Item CV	CV-G	Overall, our staff members make decisions that facilitate innovations	4.311	0.479
Part-2(Le et al., 2020)				
Financial Inclusion	FI1	Commercial bank branches per 100,000 adults	4.271	0.734
	FI2	Commercial bank branches per 1,000km	3.942	0.867
	FI3	Institutions of commercial banks	4.27	0.865
	FI4	ATMs per 100,000 adults	5.031	0.62
	FI5	ATMs per 1,000km	4.188	0.432
Part-3				
Digital Business Strategy Alignment (Li et al., 2020)	DSA1	Integrate digital technology and business strategy to attain strategic alignment	3.903	0.835
	DSA2	Create a shared vision of the role of digital technology in the business strategy	3.832	0.912
	DSA3	Jointly plan how digital technology will enable the business strategy	4.107	0.938
	DSA4	Confer with each other before making strategic decisions	3.835	0.865

Constructs	Items	Description	Mean	SD
Part-4. Digital Financial Innovation				
Digital Financial Innovation (Khin and Ho, 2019)	DFI1	The quality of our digital financial solutions is superior compared to our competitors	3.744	0.966
	DFI2	The features of our digital financial solutions are superior compared to our competitors'	3.844	0.941
	DFI3	The applications of our digital financial solutions are totally different from our competitors'	The applications of our digital financial solutions are totally different from our competitors'	3.939 & 0.929
	DFI4	Our digital financial solutions are different from our competitors in terms of product platform	3.791	0.986
	DFI5	Our new digital financial solutions are minor improvements of existing products	3.832	0.96
	DFI6	Some of our digital financial solutions are new to the market at the time of launching	3.853	0.937
	DFI7	The applications of our digital solutions are totally different from the applications of our main competitors' solutions	3.96	0.802
Part-5. (adopted from A. Lyons & Kass-Hanna, 2021)				
Access to mobile technology	DFL1	Owns mobile phone	4.18	4.027
	DFL2	Sends or receives calls	4.662	0.725
	DFL3	Sends or receives text messages	4.177	0.855
	DFL4	Sends or receives photos	3.848	3.927
	DFL5	Browses or uses the Internet	3.578	0.726
	DFL6	Downloads music, videos, or game	4.319	0.869
	DFL7	Makes financial transactions	4.612	3.509
	DFL8	Uses social networking sites	4.067	0.432
Mobile money proficiency	DFL9	Opens a mobile money menu	4.217	0.882
	DFL10	Finds particular menu options	3.994	3.632
	DFL11	Initiates transaction	4.512	0.732
	DFL12	Completes transaction	4.289	0.887
	DFL13	Owns smart phone	4.287	3.509
	DFL14	Corrects an error	4.251	0.432
	DFL15	Reverses or cancels a transaction	4.937	0.882
Part-6				
Financial Robustness (Nkundabanyanga et al., 2019)	FR1	Management is planning to scale down the number of operational branches in the nearby future	4.01	1.05
	FR2	We are compliant to applicable laws and regulations	4.326	0.98
	FR3	We sometimes experience intermittent delivery of services to our customers	4.017	0.922
	FR4	All our plans in a given financial year are implemented without postponing to other financial periods	4.232	0.97
	FR5	We deal with financial shocks well	4.087	0.98
Financial Adaptability (Nkundabanyanga et al., 2019)	FA1	Most of our operations are insured against shocks and uncertainties	3.989	0.955
	FA2	We easily adjust our operating procedures in case of need	3.935	0.96
	FA3	We consistently follow similar priorities from year to year	4.121	0.844
	FA4	We are capable of spotting opportunities in our operating environment with ease	4.153	0.946