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Synergistical effects of Knowledge Management and FinTech Adoption on Sustainable Performance of Banks in Pakistan: The moderating role of Digital Literacy

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ABSTRACT

The main objective of this research was to examine the influence of knowledge management on the sustainable performance of financial institutions, specifically banks, in Pakistan. Additionally, the study explored the mediating role of FinTech Adoption and moderating impact of digital literacy on the relationships between knowledge management and sustainable performance in Pakistan's banking sector. This research adopts a quantitative approach; data was collected from bank employees and managers. A structured questionnaire was used for data collection and data is collected from 384 respondents of the study. The study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4 to validate the proposed research model and test the hypotheses. The results indicate that knowledge management and FinTech adoption significantly affect the sustainable performance of banks. Moreover, digital literacy plays a moderating role in strengthening these relationships. The study provides valuable insights for banking institutions and policymakers, highlighting the importance of knowledge management and FinTech adoption in driving sustainability. It also emphasizes the role of digital literacy in enhancing these effects, suggesting the need for training programs to improve digital competencies in the banking sector. Practically, this study will be useful to bankers, banks, policymakers and bank authorities to develop such agencies that improve sustainable performance of banking sector. Theoretically, this study add value in the existing literature with respect to Knowledge Management Theory (KMT) and Financial Innovation Theory (FIT) because all the organization consider technologies and knowledge as assets of the company and utilize it to

improve the overall sustainable performance of the banking sector, in Pakistan. This research contributes to the existing literature by integrating knowledge management, FinTech adoption, and digital literacy into a single framework, offering a novel perspective on sustainable performance in the banking sector of Pakistan.

Keywords: Knowledge Management, FinTech Adoption, Digital Literacy, Sustainable Performance, Banking Sector

INTRODUCTION

The twenty-first century is seen as the information technology or (IT) period, with a focus on industrialization in an economy that has performed poorly due to multiple reasons. Every industry in the economy suffers from a variety of issues, including COVID-19 pandemic, modern technologies, innovative knowledge and corporate governance (Martínez-Falcó et al., 2024; Qadri, Ma, et al., 2023; Qadri, Raza, et al., 2023; Wasiq et al., 2023). In the current digital age, organizations fight to improve their performance in order to get a competitive advantage and grab the market. Organizations of all sizes have invested their resources to achieve sustainable performance (Xin et al., 2023; Rana, & Tuba, 2015)). As a result, sustainability performance is becoming more and more popularity and matter of concern in this competitive environment. Organizations all across the globe are using sustainable practices to address this concern (Salim et al., 2023). The amalgamation of an organization's environmental, social, and economic performance is referred as sustainable performance, or (SP) (Siddik et al., 2023). As a result, challenges related to environmental protection, social welfare, economic growth, and technological innovation are not new, but combining these issues in single research is becoming more significant.

In recent times, organizations are using modern technology as well as innovative knowledge and skills to enhance their productivity and sustainability performance. Consequently, the adoption of knowledge management or (KM) has grown substantially, and it is now recognized as a valuable asset for organizations (Almuayad et al., 2024). Santoro et al., (2018) define knowledge management as the act of discovering, obtaining, retrieving, and disseminating explicit, tacit, and implicit knowledge in all business operations. Nowadays, knowledge management is regarded the base and most significant aspect of competitiveness. In addition to knowledge management and innovation is also acknowledged as the most important factor for the survival of organizations in competitive world (Safaee & Yadegari, 2022). Furthermore, the organizations both (profit oriented and non-profit oriented), have begun developing and putting knowledge management (KM) strategies into actions in order to achieve sustainable performance (Safaee & Yadegari, 2022). The author also stated that that knowledge management (KM) assists organizations in discovering new things, selecting new ways of doing businesses, organizing it, and disseminating useful information to all stakeholders. The motivation for this study comes from the organizations that are adopting innovative technologies and acquiring &

implementing creative knowledge that enhances sustainability performance (Kocjancic & Gricar, 2023). Thus, the goal of this study is to demonstrate how effective knowledge management may raise a sustainable performance and success in the marketplace.

In the meantime, technological advancements have also changed the nature of the corporate world in several ways, not simply in relation to knowledge management (Melati, 2024). In the current technological era, technology plays a major role in everyday life by facilitating instant access to the most recent information and offering users advanced electronic services. The economy of emerging countries and sustainability are also greatly impacted by these changes. Traditional business models are being replaced by new, dynamic ones thanks to technology (Melati, 2024; Imran, & Akhtar, 2023). Nowadays, financial technology or FinTech, is one of the hottest topics in the financial industry, particularly among banks. According to Uddin et al., (2024), FinTech, is the fusion of financial services and technology, has made different activities more efficient and user-friendly by transforming them into electronic mode by Shaukat, Qureshi, and ul Haq (2020). As a result, the adoption of FinTech innovations like digital payments and mobile banking is applauded for increasing consumer access to financial services (Firdos, Khan, & Atta, 2024). Hence, the use of fintech in this context not only enhances the overall sustainability of the banking industry but also helps to streamline financial operations (Wang et al., 2024). According to Oleksiuk, (2024) Fintech Ecosystem of Pakistan Landscape Study Report, 85% of users between the ages of 18 and 24 to handle their financial transactions by use of FinTech Adoption. Pakistan was ranks 91 out of 133 countries in the Global Innovation Index (GII) for 2024, making it one of the least inventive countries in the world (Dutta et al., 2024). Finally, Fintech, or the application of digital technology to financial services, is transforming the future of finance, and the COVID-19 epidemic has hastened this process. Therefore, the aim of this study is to learn about knowledge management, its process, and the influence on sustainable performance of banking sector of Pakistan, as well as to assess FinTech Adoption as mediating role (Farooq, et al., 2021).

Knowledge management alone is insufficient for sustainable performance but digital literacy (DL) is essential for improving the overall organizational performance through FinTech adoption. It makes it possible for people to comprehend digital technologies (FinTech) and use them successfully in real-world situations. According to Haddadi Harandi et al., (2019), the capacity to acquire and disseminate knowledge via the use of Information and Communication Technologies (ICTs) or a device is called digital literacy. The author further argue that digital literacy helps the people to understand what kind of knowledge and skills are required to utilize modern technologies, as well as how to use them in practical life (Imran, Sultana, & Ahmed, 2023).

Recent research has produced a significant amount of literature on knowledge management and sustainable performance (Kordab et al., 2020; Qader et al., 2022; Makhloufi et al., 2023; Martínez-Falcó et al., 2024). The research gap includes a range of viewpoints. There is no empirical research in the Pakistan region that looks at the

connection between knowledge management and organizational sustainable performance through the adoption of FinTech and digital literacy, this study fills a vacuum in the scientific literature. However, the role of FinTech adoption and digital literacy in shaping this relationship, which remains insufficiently explored. And no research has been done to examine the intricate relationships that exist between KM, FA, DL and SP in Pakistan's banking industry. To overcome this research gap, the study aims to analyze the relationship of KM on SP, as well as the mediating effect of FA and the moderating effect of DL on this link (Azhar, 2024). Finally, the state problem and research gap in the literature motivated this study, which aimed to address the research questions listed below and lessen the uncertainty around these relationships.

1. What is the impact of knowledge management on sustainable performance in banking sector of Pakistan?
2. Whether FinTech adoption serves as a mediator in the relationship between knowledge management and sustainable performance in Pakistan's banking sector?
3. How does digital literacy moderate the relationship between FinTech adoption and sustainable performance in banking sector of Pakistan?
4. What role does digital literacy play in influencing the adoption of FinTech to enhance sustainable performance in Pakistan's banking sector?

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Knowledge management, FinTech adoption, digital literacy and sustainable performance have attracted a lot of interest in recent years. This literature review combines the findings of different studies together, critically assessing the factors that influence organizational sustainable performance and the effective deployment of paperless payment systems into different sectors.

Theoretical Background

The present study is grounded in two fundamental theories: "Knowledge Management Theory" and "Financial Innovation Theory".

Knowledge Management Theory (KMT)

According to Bolisani & Bratianu (2018), knowledge is an abstract or idea that exists independently of the physical world and may be classified as either explicit or tacit. Explicit information is often presented in writing form, such as articles, reports, manuals, books, newspapers, or other written mediums. Contrary to this, tacit knowledge is unwritten and existing in people's thoughts (Abbas & Sağsan, 2019). As a result, unlike explicit information, tacit knowledge is unwritten and unsaid, and it is also challenging to transfer from one person to another people (Fatima, Khan, & Kousar, 2024). In light of this, knowledge management may be defined as the conversion of tacit information into explicit knowledge that is transferred into an organization, allowing the organization to improve its overall performance and encouraging innovation and creativity without any hurdle. In this study, the author applies a WIIG Knowledge Management Model developed by Karl Wiig (Wiig, 1997). The author's major focus is simply knowledge management rather than the entire process. Figure (1) displays the WIIG Knowledge Management Model, as mentioned.

Figure 1: WIIG Knowledge Management Model

Financial Innovation Theory (FIT)

According to Akkaya, (2019), financial innovation involves offering more affordable and accessible services while enhancing service quality over time, made possible through the use of modern technologies such as FinTech. As a result, financial innovation theory posits that financial institutions must use FinTech and provide services more effectively in order to improve corporate sustainable performance (Al-Dmour et al., 2020). Therefore, the banking industry's overall sustainable performance is improved by the adoption of FinTech, which creates new financial innovation and new mode of providing services. Figure (2) depicts the Innovation Model, although the author focuses on technological innovation (FinTech) in this research.

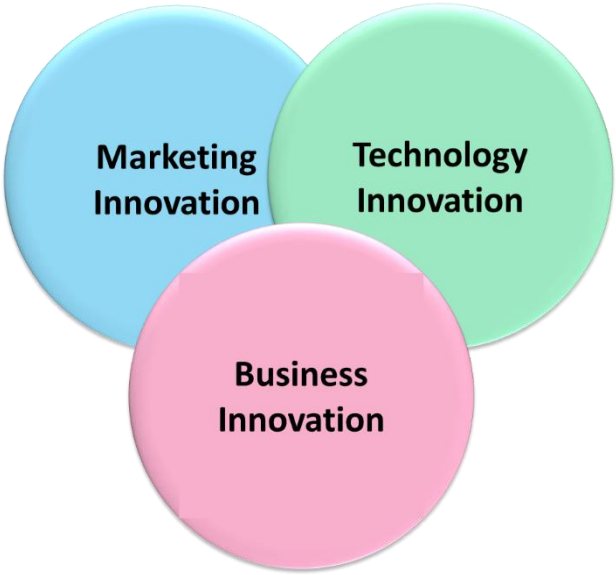

Figure 2: Innovation Model

Knowledge Management

Durst et al., (2024), define knowledge management (KM) as the process through which an organization leverages its internal and external knowledge to create

value. The author of the Baig et al., (2024), study noted that knowledge management is consider as important tool that helps businesses to improve their performance and competitiveness in competitive market. Therefore, the organizations must be excellent at managing their own knowledge if they want to perform better and maintain competitive edge. Additionally, in order to increase the banking industry's competitiveness in the business world, knowledge management is therefore seen as an essential component for discovering new information and implementing it (Martínez-Falcó et al., 2024; Nawaz, et al., 2024). As a result, knowledge management offers a new business model for organizations seeking economic, social, and environmental sustainability.

FinTech Adoption

In his study the Ioannou et al., (2024), define FinTech as the use of digital technology in financial services to enhance and automate banking, payments, lending, and investing procedures. Therefore, on said discussion FinTech is comibnation of two words Finance and Technology. Further the author also argu that, the definitions differ, with some interpreting the term FinTech more broadly as "financial solutions powered by technology". FinTech has been discussed in academic literature as the banking industry's incumbent (Azhar, 2024). Likewise, according to (Philippon, 2019), FinTech has the potential to easy access to financial services, provide new ways for providing and delivering products and services. The author of this study further noted that firms that adopt FinTech to deliver their services have also proven lucrative. Interestingly, little study has been conducted on the connection between FinTech adoption and sustainable performance or FinTech adoption as mediator. This is the gap that this study tries to fill.

Digital Literacy

Haddadi Harandi et al., (2019), defined digital literacy as the capacity to use information and communication technologies (ICT) to study and share knowledge. Digital literacy has grown in popularity since the late twentieth century, and it is frequently associated with computer literacy, ICT literacy, information literacy, and media literacy. Digital literacy is on the capacity to obtain and analyses information using digital tools (Chong & Zainal, 2024). This study finds digital literacy to be an important aspect in promoting sustainable performance and organizational effectiveness. In this study, digital literacy is considered as moderator variable between knowledge management, FinTech adoption and the sustainable performance.

Sustainable Performance

According to Kordab et al., (2020), sustainable performance mean the optimal use of available resources without compromising future economic prospects or harming society or the environment. The literature mentioned many studies that there are three dimensions of sustainable performance (social, economic, and environmental). The three components of sustainable performance (social, economic, and environmental) have been the subject of several research, according to the literature (Shahzad et al., 2020; Yusliza et al., 2020).

Knowledge Management and Sustainable Performance

In today's competitive world, effective organizations are those that create,

acquire and share new knowledge and apply that knowledge to improve the sustainability performance of the organization (Safaee & Yadegari, 2022). Another study of Kocjancic & Gricar, (2023), reveal that the organization may encourage their employees to find out new ways or ideas that solve the real world problem into novel ways. This increases the company's competitiveness and organizational success in long run. (Safaee & Yadegari, 2022). Demir et al., (2023), note that knowledge storage is essential to the creation, exchange, and use of knowledge. Further, it has been noted that knowledge management significantly affects the sustainability of a business (Nawaz, et al., 2024; Tuba, & Rana, 2015). According to a large body of recent literature, success of the organizations and knowledge management are significantly correlated (Demir et al., 2023; Sahibzada et al., 2020). Therefore, it supports the banks' efforts to stay competitive. Consequently, the financial sector performs better when they apply new and innovative knowledge into the banking sector. Further, the author of the study Demir et al., (2023), the same study will be carried out using a different sample, sector, and region. As a result, the following hypothesis is proposed:

H_1 Knowledge management has significant impact on sustainable performance of banking sector in Pakistan.

Knowledge Management, FinTech Adoption and Sustainable Performance

Fintech helps the people, business owners, and entrepreneurs manage their financial operations, processes, and lives more effectively by utilizing a range of artificial intelligence (AI), contemporary technologies (Udeagha & Muchapondwa, 2023). The author further stated that the FinTech adoption promote environmental sustainability. The research of Kabir & Sayem, (2022), FinTech adoption as a mediator discovered that the use of FinTech products and services has a considerable impact on economic expansion (Shaukat, Rehman, & ul Haq 2021). Melati, (2024), note that Fintech adoption has been shown to considerably improve operational efficiency, increase profitability, and promote overall organizational growth. According to a recent study by Wang et al., (2024) and (Baig et al., 2024), the usage of FinTech adoption has improved the performance of high-tech enterprises relative to non-high-tech sectors. Lontchi et al., (2023), examine the operational and financial performance of different SMEs who adopt FinTech. The findings show that the adoption of FinTech during COVID-19 had a substantial influence on SMEs' operational and financial performance. Therefore, it is necessary to examine previous literature in order to gather findings and synthesize that how FinTech adoption enhances an organization's sustainable performance and offers new ways of providing services. This study proposes the following hypothesis in light of this:

H_2 Knowledge management has significant impact on FinTech adoption in banking sector of Pakistan.

H_3 FinTech adoption significantly mediates the relationship between knowledge management and sustainable performance of banking sector in Pakistan.

Knowledge Management, FinTech Adoption, Digital Literacy and Sustainable Performance

Moreover, Digital literacy also plays a significant role in organizational decision making, which helps organizations take advantage from opportunities and

adjust according to the change (Kulathunga et al., 2020). As a result, increased digital literacy is critical for the effective running of the banking industry, which improves overall bank performance. The following hypothesis is put out in light of the foregoing:

H_4 Digital Literacy moderates the relationship between knowledge management and FinTech adoption of banking sector in Pakistan.

H_5 Digital Literacy moderates the relationship between FinTech adoption and sustainable performance of banking sector in Pakistan.

RESEARCH METHODS

The purpose of this study is to investigate how knowledge management affects ongoing FinTech use with a moderating influence and sustainable organizational performance. A questionnaire, a popular technique for obtaining a lot of quantitative data, was used in this study to collect data. A structured questionnaire with a 5-point Likert scale was used to collect responses. 1 = strongly disagree; 5 = strongly agree. The study was conducted in Pakistan, and the banking sector in Pakistan provided the data. The sample size was not constrained because the goal was to collect data from banks of all sorts (public, private, and privatized).

Data Collection and Sample

The personnel of Pakistan's banking industry were the study's target population; class IV employees were not included since they lacked digital literacy and were unaware of the usage of FinTech. Convenience sampling was employed in this study to properly choose participants from Pakistan's banks. The study's sample comprised 384 employees from the banking sector of Pakistan, representing a diverse range of academic backgrounds and job titles. The sample is generated on the basis of the Morgan table because if the study's population exceeds one million, the last tier of the Morgan table is automatically selected (Krejcie & Morgan, 1970).

Data Analysis Technique

The stated hypotheses were tested in this study using partial least squares modeling (PLS-SEM). This method was particularly appropriate for this model as it made it possible to estimate a large number of intricate structural relationships between variables and examine the mediating and moderating effects of those relationships. Furthermore, PLS-SEM produced reliable results without requiring a huge sample size.

Conceptual Framework

A model to direct this was developed by reviewing and integrating the theoretical foundation: (knowledge management theory and financial innovation theory), and pertinent literature on knowledge management, FinTech adoption, digital literacy and sustainable performance. In order to verify and investigate the relationships among the research variables, the following model is suggested: independent variables (knowledge management) which have following components, such as knowledge creation, acquisition, sharing, and application, dependent variables (sustainable performance), mediating variables (Fintech Adoption), and moderating variables (digital literacy). Figure (2) depicts these possible hypothetical relationships.

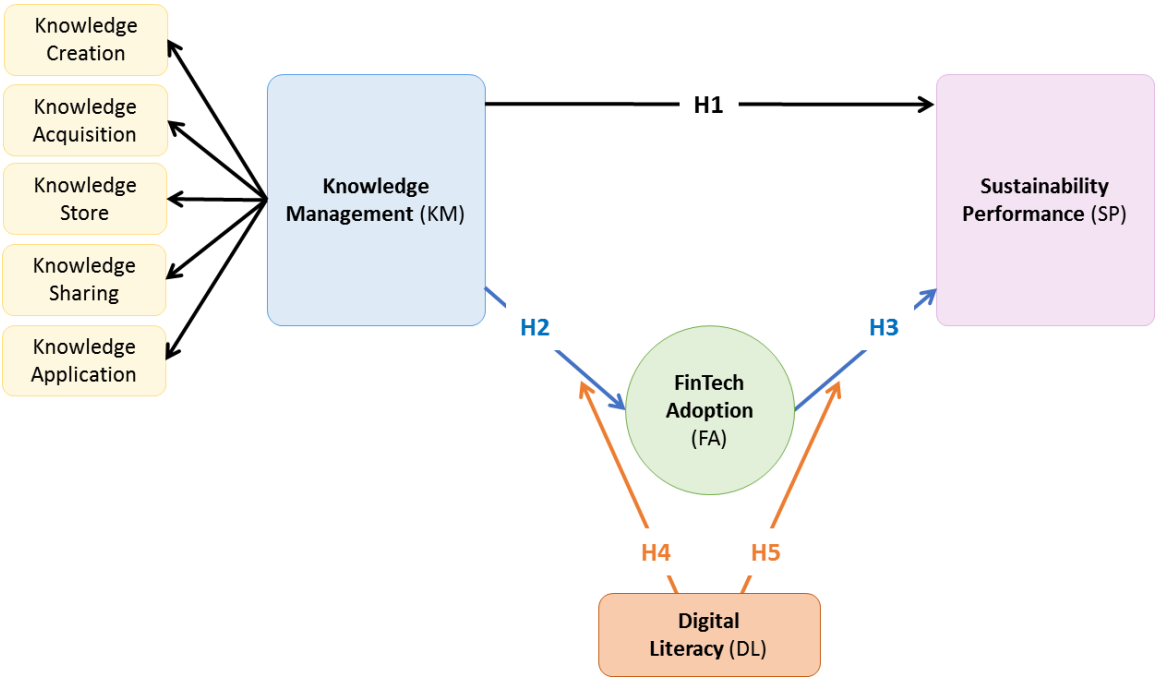

Figure 3: Conceptual Framework

Instrument Design / Measurement Scale

A questionnaire with four constructs was created using the existing body of literature on said topic. The questionnaire was divided into two sections. The first section captured respondents' demographic information including gender, age, job title, educational background, and experience level (see Table 1). The second section included various items/scale/instruments designed to measure each variable. The first scales, which included ten questions regarding knowledge management, were adapted from Safaee & Yadegari, (2022), whereas FinTech Adoption, which included ten items, was adapted from Joshi & Karamacharya, (2024). The third scale addressed digital literacy and comprised nine items adapted from (Restianto et al., 2024). Ten questions on the final scale, which focused on sustainable performance, were taken from Joshi & Karamacharya, (2024) work. Furthermore, the surveys questionnaire contained demographic variable questions.

DATA ANALYSIS AND RESULTS

Background Information of the Respondents

The responder demographic is shown in Table (1). From an aggregate of 384 respondents, the data presented in Table (1) reveals the following: 215 (56%) were between the ages of 18 and 30. These respondents are subsequently followed by 91 (24%) who are between the categories of 31 and 40. At the same time, 45 (12%), 33 (9%) individuals, were respectively, are between the ages of 41 and 50 and 50 years or above. It also seems that male (88%) makes up the majority of the respondents. Additional details regarding the education and qualifications of the respondents are in Table (1). The data in this table reveal that most respondents (47%) had bachelor's degrees, and (30%) of the entire sample had master's degree and (9%) have above masters. Only 13% of participants had professional degree. As a result, the vast

majority of the participants were well qualified. Further, the results also demonstrated that most of the respondents have experience less than 10 years (60%). This is because the employees working in banking sector switch their jobs when they have another sound opportunity. In this way they have spent less time in one bank and moved to another bank.

Variables	Respondent Description	Frequency	%Age
Age	18-30 years	215	56%
	31-40 years	91	24%
	41-50 years	45	12%
	50 years or above	33	9%
	Total	**384**	**100%**
Gender	Male	336	88%
	Female	48	13%
	Total	**384**	**100%**
Education	Graduation	182	47%
	Masters	116	30%
	M.S	36	9%
	Professional Qualification	50	13%
	Total	**384**	**100%**
Experience	1 - 5 years	137	36%
	6 - 10 years	91	24%
	11 - 15 years	76	20%
	16 - 20 years	48	13%
	20 or above years	32	8%
	Total	**384**	**100%**

Table 1: Demographic Information of the Respondents

Measurement Model

Measurement Model is used to access the validity of the variables. Table (1) shows the result of Outer Loadings. In the given Table (1) all the items are above .70 which are valid for this study. Items with values less than the given threshold are removed from this study. The Outer Loadings in Smart PLS analysis's findings are shown graphically in Figure (4) below. The measurement model shows the reliability and validity of the studied construct. This tool used to assess this is with Cronbach's Alpha (CA), Composite Reliability (CR) and Average Variance Extracted (AVE). Hair et al., (2019), set criteria for Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE), stating that all factor loadings should be enough if they reach more than 0.70, as should Cronbach's Alpha and Composite Reliability values and the AVE should exceed 0.50 (see Table (2)).

Sr. #	Variables	Items	KM	FA	DL	SP
1	**Knowledge Management**	**KM1**	0.812			
		KM2	0.922			
		KM3	0.781			
		KM4	0.920			
		KM5	0.920			
		KM6	0.940			
		KM7	0.794			
		KM8	0.913			
		KM9	0.926			
		KM10	0.765			
2	**FinTech Adoption**	**FA1**		0.748		
		FA2		0.890		
		FA3		0.903		
		FA4		0.903		
		FA5		0.818		
		FA6		0.745		
		FA7		0.786		
		FA8		0.880		
		FA9		0.757		
		FA10		0.753		
3	**Digital Literacy**	**DL1**			0.758	
		DL2			0.903	
		DL3			0.849	
		DL4			0.907	
		DL5			0.835	
		DL6			0.756	
		DL7			0.843	
		DL8			0.824	
		DL9			0.741	
4	**Sustainable Performance**	**SP1**				0.705
		SP2				0.896
		SP3				0.908
		SP4				0.880
		SP5				0.701
		SP6				0.883
		SP7				0.902
		SP8				0.878
		SP9				0.878
		SP10				0.871

Table 2: Results of Outer Loadings (Source: Data Processed with Smart PLS 4)

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
DL	0.941	0.943	0.951	0.683
FA	0.945	0.947	0.954	0.674
KM	0.965	1.044	0.969	0.760
SP	0.958	0.960	0.964	0.729

Table 3: Result of Measurement Model (Source: Data Processed with Smart PLS 4) Knowledge Management (KM); FinTech Adoption (FA); Digital Literacy (DL); Sustainable Performance (SF)

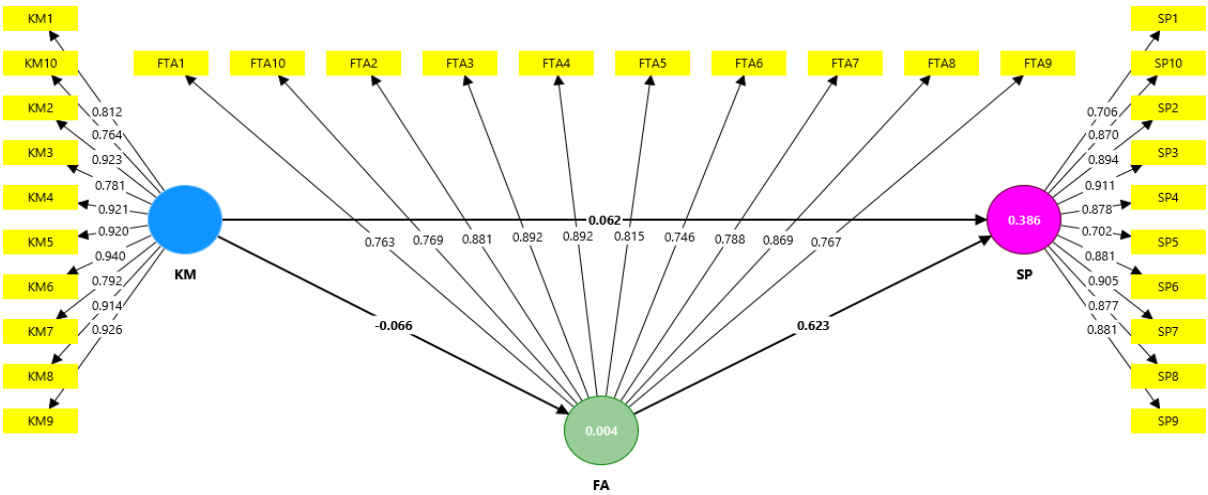

Figure 4: Result of Measurement Model (Source: Data Processed with Smart PLS 4) Knowledge Management (KM); FinTech Adoption (FA); Digital Literacy (DL); Sustainable Performance (SF)

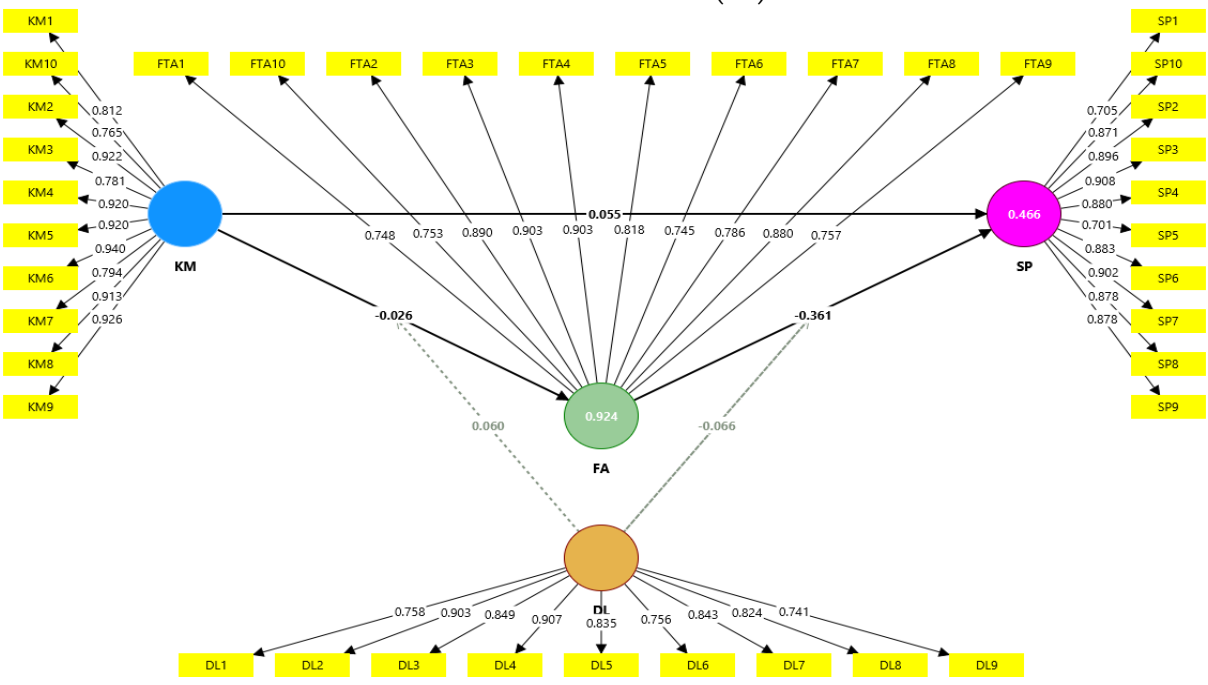

Figure 5: Result of Measurement Model with moderating effect (Source: Data

Processed with Smart PLS 4)

Knowledge Management (KM); FinTech Adoption (FA); Digital Literacy (DL); Sustainable Performance (SF)

Regarding the measurement model results as presented in figure (4) all selected study items are therefore valid with values higher than 0.70. Further, it is seen from figure (5) that the moderating effect for all the items is above 0.70.

Discriminant Validity

Discriminant validity was determined based on samples using Fornell Larcker Criterion whereby the AVE root value of a given construct has to be greater than the correlation between the two latent constructs. Discriminant validity seeks to check whether a certain reflective indicator is well suitable to its construct by the postulate that every indicator must have high correlation with the construct.

Variables	DL	FA	KM	SP
DL	0.826			
FA	0.959	0.821		
KM	-0.046	-0.066	0.872	
SP	0.668	0.613	0.022	0.854

Table 4: Result of Fornell Larcker Criterion (Source: Data Processed with Smart PLS 4)

Knowledge Management (KM); FinTech Adoption (FA); Digital Literacy (DL); Sustainable Performance (SF)

Variables	DL	FA	KM	SP	DL x FA	DL x KM
DL						
FA	1.017					
KM	0.061	0.067				
SP	0.686	0.628	0.034			
DL x FA	0.113	0.166	0.076	0.148		
DL x KM	0.042	0.065	0.125	0.100	0.116	

Table 5: HTMT Ratio (Source: Data Processed with Smart PLS 4)

Knowledge Management (KM); FinTech Adoption (FA); Digital Literacy (DL); Sustainable Performance (SF)

According to the results presented in Table (3) it can be concluded that has a high value meaning that the high AVE root value shows that the construct is highly different and capable of explaining the phenomenon under measurement, hence it can be concluded that the model has very high reliability. The AVE root value of the Knowledge Management construct is 0.683, this is less than the inter-construct correlation as follows: FinTech Adoption, Sustainable Performance, Digital Literacy at 0.674, 0.760 and 0.729 respectively. In case of all the latent variables, AVE > computed correlation with other constructs which fulfills the discriminant validity requirement of this model. Another approach to the discriminant validity check is the HTMT ratio. For each factor analyzed Table (4) summarizes the HTMT values. Since, it offers one of the best results predictions, PLS-SEM is often used to analyze data to test the relationship between indicators.

Structural Model

This section discusses the findings of the proposed hypothesis. The next step is to calculate the path coefficient value, which is the magnitude of the independent variable's path coefficient to the dependent variable in the tested model, taking into account both direct and indirect (mediation) effects, as well as the moderating effect. PLS-SEM structural model applied to estimate the route coefficient and beta coefficient. This possibility is indicated by the route coefficient which is sounds quite feasible. In other words, a unit variation of endogenous variables can be compared to a potential change in the endogenous variables. For the assessment of these fundamental models, the estimates of every single pathway were employed; larger than the lesser value indicates more significant impact on the endogenous variables. T-test was used to examine the significance of the relevant path coefficient(s) as a measure of the model predictive accuracy. The calculated T-statistics should be equal to or higher than the requisite target of 1.96 for significance in the test at 5 percent level of significance (see Table (5)). Using the p-value criteria, the hypothesis is accepted if the p-value is < 0.05, and rejected if the p-value is > 0.05. To measure the relationship between the complex model of variables, namely Knowledge Management (KM), FinTech Adoption (FA), Digital Literacy (DL), and Sustainable Performance (SP) the Partial Least Squares Structural Equation Model (PLS-SEM) was used. First, to confirm the proposed hypotheses, we checked the documented relations between different components Thus, after that, the bootstrapping test was conducted for 5,000 repetitions to compare the results with the proposed hypotheses.

Statistical Path	Beta (β)	Std. Dev	T-Statistics	P-Values	Decision
KM -> SP	0.488	0.108	4.514	0.000	Supported
KM -> FA	0.563	0.060	9.316	0.000	Supported
DL -> FA	1.036	0.078	13.255	0.000	Supported
DL -> SP	0.578	0.113	5.132	0.000	Supported
FA -> SP	-0.362	0.126	2.873	0.004	Supported
DL x KM -> FA	0.058	0.024	2.493	0.013	Supported
DL x KM -> SP	-0.021	0.010	2.150	0.032	Supported
DL x FA -> SP	-0.066	0.032	2.053	0.040	Supported

Table 6: Result of Path Analysis (Source: Data Processed with Smart PLS 4)
Knowledge Management (KM); FinTech Adoption (FA); Digital Literacy (DL); Sustainable Performance (SF)

Table (2) displays the results of path analysis and hypothesis testing. This table includes the statistical path, coefficient (β), standard deviation (Std. Dev), T-values (T), and P-values (P) and Decision (D).

PLS-SEM path analysis revealed a significant positive effect of knowledge management on sustainable performance (H1; KM -> SP (β = 0.488; p<0.000) and FinTech Adoption on sustainable performance (H2: KM -> FA (β =0.563; p<0.000. Thus, it can be concluded that the study supports H1 whereas H2 were supported. The result indicated that sustainable performance was positively influenced by the

FinTech Adoption (H3: FA -> SP (β = 0.362; p<0.004); Therefore, H3 were supported. The evidence produced in this work supports current theoretical constructs knowledge management theory (KMT) and financial innovation theory (FIT). In this theory, has knowledge management influenced the sustained organizational performance and has financial technology (FinTech adoption) also influence sustained organizational performance throughout a long period.

The moderation analysis of each independent and dependent variable was the final step in the PLS-SEM examination. Thus, hypotheses from H4 to H5 are hypothesized that digital literacy will moderate the relationship between knowledge management & sustainable performance and FinTech adoption & sustainable performance. The findings of the analysis indicated small moderating effect on relations on both the independent and the dependent variables of the study. The findings above show that digital literacy has a moderating role that is shown between knowledge management and sustainable performance (H4: DL x KM -> FA (β =0.058; p<0.013) and FinTech adoption and sustainable performance (H5; DL x KM -> SP (β =0.021; p<0.032). Thus, H4 and H5 are approved as there is robust moderation relationship present.

DISCUSSION AND CONCLUSION

The findings of this study indicated that knowledge management has a direct and significant effect on sustainable performance. The findings also indicated that the moderating effect of digital literacy was confirmed for the effect of knowledge management on FinTech Adoption and FinTech Adoption on sustainable performance. Thus, the research hypotheses have positively supported the relationship between knowledge management and Fintech Adoption and organizational sustainable performance. The findings of similar studies agreed with this research findings, for example, (Ali Sair et al., 2024; Fraihat & Al-Afeef, 2022).

In addition, this study makes contribution to the existing literature by testing the knowledge management and fintech adoption model in the context of Pakistan's banking industry. Hence, the findings of the study raise awareness of the consideration that for achieving sustainable performance, banks need to invest in improving digitization and digital literacy especially in relation to knowledge management, acquire and implement fintech solutions and educate their employees on how to properly utilize digital resources. Finally, some of the implications of the present studies are also as follows and they have different important effects on policymakers, at academia and at industries.

The results of this paper will be relevant to the bank managers who are interested in enhancing the competitiveness and sustainability of the banking sector in Pakistan; the policymakers who are keen to learn more about factors that impact the performance of Pakistan's banking sector and the overall economic performance of the country; as well as any other readers who interested in increasing competitiveness of the banking sector as well as improving the economic performance of Pakistan. Since, knowledge management is deployed with rationale and purpose as a strategic tool, knowledge management can enhance an organization's performance,

productivity, and optimization of organizational objective achievement and continuous learning. However, when applied to the field of technology, particularly, the field of FinTech, knowledge management is expected to extend benefits to organizations and financial institutions, including banks by making advancement more orderly and profitable and by planting more profitable branches.

Attempting to ignore or transcend one's desires and fears is never feasible, and every researcher has his or her own goals and things that cannot be done. First, this research work is confined to Pakistan commercial banks, however future research of this study may try to generalize this research study to other sectors of Pakistan and may also try to do cross-sectional comparison among different sectors. Second, this study only collects the primary data through the questionnaire survey and the data collection limits the degree to which it can be generalized to different contexts such as industries and different legal systems. Therefore, in the future, this subject may use secondary data to assess today's knowledge management practices, FinTech, and sustainability concerns. Third, the examination of sustainability performance of banks is measured within technology and requires another internal and external factor influencing this relationship. Finally, this study will look at the future where green is more embracing, ranging from green banking to green knowledge management.

REFERENCES

Abbas, J., & Sağsan, M. (2019). Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. Journal of Cleaner Production, 229, 611–620. https://doi.org/10.1016/j.jclepro.2019.05.024

Akkaya, M. (2019). Financial Innovation: Theories, Models, and Future. In IGI Global (pp. 115–139). IGI Global. https://doi.org/10.4018/978-1-5225-7180-3.ch007

Al-Dmour, H., Asfour, F., Al-Dmour, R., & Al-Dmour, A. (2020). The effect of marketing knowledge management on bank performance through fintech innovations: A survey study of jordanian commercial banks. Interdisciplinary Journal of Information, Knowledge, and Management, 15, 203–225. https://doi.org/10.28945/4619

Azhar, Z. (2024). Blockchain as a Catalyst for Green and Digital HR Transformation: Strategies for Sustainable Workforce Management. *Open Access Library Journal, 11(9),* 1-22

Azhar, Z. (2024). The Role of Chatbots in Enhancing Job Seekers' and Employee Experience: A Case Study on CV Warehouse. *The Journal of Social Sciences Research, 10(4),* 23-35.

Ali Sair, S., Sohail, A., & Nisar, S. (2024). Financial Technology (Fintech) Innovation and Sustainable Business Performance: Assessing the Contribution of Knowledge Management. 4(1), 146–165. https://rbe.uskt.edu.pk

Almuayad, K. M. A., Chen, Y. Z., Alammari, A. A. S., & Al-Dubai, S. A. (2024). Effect of Knowledge Application and Knowledge Storage on Bank Performance Through Fintech Innovation: A Study of Yemeni Banks. International Journal of Knowledge Management, 20(1), 1–18. https://doi.org/10.4018/IJKM.336855

Baig, M. H., Xu, J., Shahzad, F., & Ali, R. (2024). Revealing the potential of FinTech innovation through knowledge assets: a study of firm financial performance. International Journal of Innovation Science, February. https://doi.org/10.1108/IJIS-09-2023-0204

Bolisani, E., & Bratianu, C. (2018). The Elusive Definition of Knowledge. In Knowledge Management and Organizational Learning (Vol. 4, Issue July). https://doi.org/10.1007/978-3-319-60657-6_1

Chong, Y. K., & Zainal, S. R. M. (2024). Employee agility's moderating role on the link between employee vitality, digital literacy and transformational leadership with job performance: an empirical study. Cogent Business and Management, 11(1). https://doi.org/10.1080/23311975.2024.2337447

Demir, A., Budur, T., Omer, H. M., & Heshmati, A. (2023). Links between knowledge management and organisational sustainability: does the ISO 9001 certification have an effect? Knowledge Management Research and Practice, 21(1), 183–196. https://doi.org/10.1080/14778238.2020.1860663

Devi, A., Firmansyah, I., Yuniarto, A. S., Hamid, B. A., & Nawawi, M. K. (2023). Determinant Factor Analysis of Financial Technology Adoption Among Halal Sector Microenterprises in Indonesia. Amwaluna: Jurnal Ekonomi Dan Keuangan Syariah, 7(2), 347–368. https://doi.org/10.29313/amwaluna.v7i2.12546

Durst, S., Foli, S., & Edvardsson, I. R. (2024). A systematic literature review on knowledge management in SMEs: current trends and future directions. Management Review Quarterly, 74(1), 263–288. https://doi.org/10.1007/s11301-022-00299-0

Dutta, S., Lanvin, B., León, L. R., Wunsch-Vincent, Pokhrel, Sacha, & Sakinah. (2024). Global Innovation Index 2024: Unlocking the Promise of Social Entrepreneurship. In World Intellectual Property Organization (Vol. 15, Issue 1).

Farooq, S., Khan, M. L., Bhatti, M. I., Afzal, R., & Khan, N. (2021). Peer Tutoring Rather than Traditional Lecture Method: A Phenomenological Study. *Turkish Online Journal of Qualitative Inquiry*, *12*(10).

Firdos, S., Khan, M. L., & Atta, N. (2024). Intrinsic Motivation and Social Emotional Competence and Job Satisfaction Among School. *International Research Journal of Social Sciences and Humanities*, *3*(2), 58-79.

Fatima, S., Khan, M. L., & Kousar, R. (2024). Emotional Intelligence, Religiosity and Quality of Life Among University Students. *Journal of Social & Organizational Matters*, *3*(2), 455-471.

Fraihat, B. A. M., & Al-Afeef, M. A. M. (2022). The Moderating Effect of Financial Technology (Fintech) Innovation between Knowledge Management Infrastrastructure and Institutions Performance. Researchgate.Net, 8(April), 91–95. https://doi.org/10.17605/OSF.IO/NMKVH

Haddadi Harandi, A. A., Bokharaei Nia, M., & Valmohammadi, C. (2019). The impact of social technologies on knowledge management processes: The moderator effect of e-literacy. Kybernetes, 48(8), 1731–1756. https://doi.org/10.1108/K-11-2017-0413

Hair, J. F., Page, M., & Brunsveld, N. (2019). Essentials of Business Research Methods.

Routledge. https://doi.org/10.4324/9780429203374

Imran, M., & Akhtar, N. (2023). Impact of Ethical Leadership Practices on Teachers' Psychological Safety and Performance: A Case of Primary School Heads in Karachi-Pakistan. Academy of Education and Social Sciences Review, 3(2), 172-181. https://doi.org/10.48112/aessr.v3i2.505

Ioannou, S., Wójcik, D., & Urban, M. (2024). FinTech and financial instability. Is this time different? Journal of Post Keynesian Economics, 47(3), 542–565. https://doi.org/10.1080/01603477.2024.2315055

Imran, M., Sultana, Z., & Ahmed, S. (2023). The Influence 0f Student-Teacher Interactions on Secondary School Students' academic Performance. *Benazir Research Journal of Humanities and Social Sciences, 2(1)*.

Kabir, S., & Sayem, S. M. (2022). FinTech Services and Network Economics : Mediating Effect of FinTech Adoption. International Journal Of Advance Research And Innovative Ideas In Education, 8(5), 314–326. https://www.researchgate.net/publication/365035505%0AFinTech

Kocjancic, L., & Gricar, S. (2023). Usage of AI in Sustainable Knowledge Management and Innovation Processes; Data Analytics in the Electricity Sector. FinTech, 2(4), 718–736. https://doi.org/10.3390/fintech2040040

Kordab, M., Raudeliūnienė, J., & Meidutė-Kavaliauskienė, I. (2020). Mediating role of knowledge management in the relationship between organizational learning and sustainable organizational performance. Sustainability (Switzerland), 12(23), 1–20. https://doi.org/10.3390/su122310061

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

Kulathunga, K., Ye, J., Sharma, S., & Weerathunga, P. . (2020). How does technological and financial literacy influence SME performance. Information (Switzerland), 11(297), 20.

Lontchi, C. B., Yang, B., & Shuaib, K. M. (2023). Effect of Financial Technology on SMEs Performance in Cameroon amid COVID-19 Recovery: The Mediating Effect of Financial Literacy. Sustainability (Switzerland), 15(3). https://doi.org/10.3390/su15032171

Martínez-Falcó, J., Marco-Lajara, B., Zaragoza-Sáez, P., & Sánchez-García, E. (2024). The effect of knowledge management on sustainable performance: evidence from the Spanish wine industry. Knowledge Management Research and Practice, 22(3), 298–313. https://doi.org/10.1080/14778238.2023.2218045

Melati, Y. A. (2024). Fintech and financial performance in the banking industry: A literature review. Asian Journal of Economics and Business Management, 3(1), 357–361. https://doi.org/10.53402/ajebm.v3i1.385

Nawaz, H., Maqsood, M., Ghafoor, A. H., Ali, S., Maqsood, A., & Maqsood, A. (2024). Huawei Pakistan Providing Cloud Solutions for Banking Industry: A Data Driven Study. *The Asian Bulletin of Big Data Management*, *4*(1), 89-107.

Nawaz, H., Sethi, M. S., Nazir, S. S., & Jamil, U. (2024). Enhancing national cybersecurity and operational efficiency through legacy IT modernization and

cloud migration: A US perspective. *Journal of Computing & Biomedical Informatics*, *7*(02).

Oleksiuk, A. (2024). FinTech Industry Trends in 2024: The Year of the Connected Customer. https://intellias.com/fintech-in-the-year-of-the-connected-customer/

Philippon, T. (2019). The FinTech Opportunity. The Disruptive Impact of FinTech on Retirement Systems, March, 190–218. https://doi.org/10.1093/oso/9780198845553.003.0011

Qader, A. A., Zhang, J., Ashraf, S. F., Syed, N., Omhand, K., & Nazir, M. (2022). Capabilities and Opportunities: Linking Knowledge Management Practices of Textile-Based SMEs on Sustainable Entrepreneurship and Organizational Performance in China. Sustainability (Switzerland), 14(4). https://doi.org/10.3390/su14042219

Qadri, S. U., Ma, Z., Raza, M., Li, M., Qadri, S., Ye, C., & Xie, H. (2023). COVID-19 and financial performance: Pre and post effect of COVID-19 on organization performance; A study based on South Asian economy. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.1055406

Qadri, S. U., Raza, M., Qadri, S., Mahmood, S., Ye, C., Rauf, F., Taqi, M., & Hossain, M. S. (2023). Overflow Effect of COVID-19 Pandemic on Stock Market Performance: A Study Based on Growing Economy. Discrete Dynamics in Nature and Society, 2023(December 2019). https://doi.org/10.1155/2023/9536571

Raza, M., Bilal, M. A., Khan, A. B., & Taqi, M. (2023). Adapting Corporate Governance for Sustainable Organizational Performance: A Case Study of the Banking Sector in Pakistan amid the COVID-19 Pandemic. Journal of Innovative Research in Management Sciences, 4(2), 53–68. https://doi.org/10.62270/jirms.v4i2.59

Rana, N. A., & Tuba, A. (2015). Diffusing ICT to enhance students' academic writing skills: An experimental study at a business institute in Karachi, Pakistan. *International Journal of English and Education*, *4*(3), 1-18.

Restianto, Y. E., Suliyanto, Naufalin, L. R., Krisnaresanti, A., Dinanti, A., Iskandar, D., & Sugiyono. (2024). User Experience and Behavioral Intention To Use E-Commerce: a Study of Digital Literacy As a Moderating Variable. Journal of Governance and Regulation, 13(1), 8–17. https://doi.org/10.22495/jgrv13i1art1

Shaukat, U., Rehman, A., & ul Haq, A. (2021). Pairs Trading and Stock Returns: An Evidence from Pakistan Stock Exchange. *City University Research Journal*, *11*(2).

Shaukat, U., Qureshi, S. A., & ul Haq, A. (2020). Derivative Usage and Bank Stability: A Comparison of Islamic and Conventional Banking from Pakistan.

Safaee, L., & Yadegari, R. (2022). Enhancing financial performance by applying knowledge management and new financial technologies in the banking industry. Journal on Innovation and Sustainability RISUS, 13(3), 25–38.

Sahibzada, U. F., Jianfeng, C., Latif, K. F., Shah, S. A., & Sahibzada, H. F. (2020). Refuelling knowledge management processes towards organisational performance: mediating role of creative organisational learning. Knowledge Management Research and Practice, 1–13. https://doi.org/10.1080/14778238.2020.1787802

Salim, K., Disli, M., Ng, A., Dewandaru, G., & Nkoba, M. A. (2023). The impact of

sustainable banking practices on bank stability. Renewable and Sustainable Energy Reviews, 178(March). https://doi.org/10.1016/j.rser.2023.113249

Santoro, G., Vrontis, D., Thrassou, A., & Dezi, L. (2018). The Internet of Things: Building a knowledge management system for open innovation and knowledge management capacity. Technological Forecasting and Social Change, 136(September), 347–354. https://doi.org/10.1016/j.techfore.2017.02.034

Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. Journal of Knowledge Management, 24(9), 2079–2106. https://doi.org/10.1108/JKM-11-2019-0624

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, 137658. https://doi.org/10.1016/j.jclepro.2023.137658

Tuba, A., & Rana, N. A. (2015). Using social networking site (SNS) in students' learning experiences: An experimental study at higher secondary school Karachi, Pakistan. *Int. J. Engl. Educ*, *4*(3), 238-249.

Uddin, M. M., Sultana, S., & Rima, S. (2024). Adoption of Fintech for Sustainable Administrative Efficiency of Higher Educational Institutions: Bangladesh Perspective. Journal of Information and Knowledge Management, June, 0–26. https://doi.org/10.1142/S0219649224500746

Udeagha, M. C., & Muchapondwa, E. (2023). Green finance, fintech, and environmental sustainability: fresh policy insights from the BRICS nations. International Journal of Sustainable Development and World Ecology, 30(6), 633–649. https://doi.org/10.1080/13504509.2023.2183526

Wang, C., Wang, L., Zhao, S., Yang, C., & Albitar, K. (2024). The impact of Fintech on corporate carbon emissions: Towards green and sustainable development. Business Strategy and the Environment, August 2023, 5776–5796. https://doi.org/10.1002/bse.3778

Wasiq, M., Kamal, M., & Ali, N. (2023). Factors Influencing Green Innovation Adoption and Its Impact on the Sustainability Performance of Small- and Medium-Sized Enterprises in Saudi Arabia. Sustainability (Switzerland), 15(3).

Wiig, K. M. (1997). Knowledge management: Where did it come from and where will it go? Expert Systems with Applications, 13(1), 1–14. https://doi.org/10.1016/S0957-4174(97)00018-3

Xin, Y., Khan, R. U., Dagar, V., & Qian, F. (2023). Do international resources configure SMEs' sustainable performance in the digital era? Evidence from Pakistan. Resources Policy, 80(November 2022), 103169. https://doi.org/10.1016/j.resourpol.2022.103169

Yusliza, M. Y., Yong, J. Y., Tanveer, M. I., Ramayah, T., Noor Faezah, J., & Muhammad, Z. (2020). A structural model of the impact of green intellectual capital on sustainable performance. Journal of Cleaner Production, 249, 119334. https://doi.org/10.1016/j.jclepro.2019.119334