



RESEARCH PAPER

Effect of Fintech Adoption and Green Finance on Environmental Performance-Mediating role of Employee Green Behavior and Green Innovation

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ABSTRACT

This study explores the mediating role played by employee green behavior and green innovation. Due to the increasing environmental concern, it has now become essential for all businesses and organizations to address the ecological impact and it has now become a global priority as it has also been included in the sustainable development goals. The research paper investigates the combined influence of green finance and fintech adoption on the environmental performance of the organizations. This research adds value by investigating the mediation of employee green behavior. A questionnaire was administered to employees working in the banking sector of Pakistan to assess their perception of green finance practices and fintech adoption as well as role played by the green behavior adopted by employees. Results indicate a positive and significant relationship between green finance and environmental performance and fintech adoption and environmental performance. In addition to this it has been confirmed that employee green behavior mediates the basic relationship reaffirm that green innovation mediates the basic relationship. This suggests that employees who are more committed towards environmentally friendly practices tend to facilitate the translation of green finance and initiatives to adopt fintech into the environmental benefits for their organization. In addition to this the research also offers insights through which employee green behavior is affected by green finance and fintech adoption. Factors including organization culture, employee commitment, and awareness among employees are seen as the most potent drivers in shaping employee behaviors. This research is also beneficial to policymakers, business leaders and organizations by supporting them in the formulation of strategies that promote environmentally friendly practices.

KEYWORDS Fintech Adoption, Green Finance, Employee Green Behavior

Introduction

Nowadays the environmental crisis has grown globally and there is urgent need to address this. This has changed the viewpoints of businesses and organizations and now sustainable practices and eco-friendly technologies are on board (Pradere et al., 2023). Regarding this green finance and fintech have emerged as two significant enablers (Wen & Siddik, 2023). This is so because these give rise to innovative approaches that promote environmental performance within the organizations.

Green finance can be defined as integrating environmental considerations while making investment decisions (Mohanty et al., 2023). Fintech refers to enhancing financial services and operations by technological advancement Rhanoui, S. (2023). Green finance and fintech adoption together foster sustainable business models. Literature has confirmed the significance of fintech adoption and green finance on improving the environmental performance of the organizations, role of employees in shaping the behavior with the objective of going green has received attention (Wen & Siddik, 2023). Green innovation is

also one of the determinants of environmental performance. It can be defined as developing and implementing new technologies that promote sustainability. The aim of green innovation is to reduce the detrimental effects caused by human activities on the environment (Sahoo et. al., 2023).

Employee green behavior plays one of the most important roles as a mediator thereby influencing the successful implementation of green finance and accelerating the implementation of fintech technologies and their effects on the environment (Zacher, Rudolph & Katz, 2023). The interconnected dynamics among the four variables; fintech adoption, green finance and employee green behavior and green innovation contribute positively to achieving the sustainable development goals (Sahoo et al., 2022). Limited research has been done in the context of employee green behavior. Our research contributes in a way that it is done in the context of banking sector in Pakistan. To address the objectives following research questions have been developed:

RQ1: Does the use of fintech affect Pakistani banks' environmental and green financing performance?

RQ2: To what extent does GI mediate the relationship between Green Finance, Fintech Adoption, and the environmental performance of Pakistan's banking sector?

RQ3: Does the relationship between Fintech Adoption, Green Finance, and Environmental Performance of Pakistan's Banking Industry become mediated, either fully or partially, by green behavior on the part of employees?

The research paper will be structured as follows: Second section will consist of literature review elaborating existing research and literature on green finance, fintech adoption and green innovation and employee green behavior impact on the environmental performance. Third section will explain the research methodology elaborating the data collection process through questionnaire. The fourth section will present the results of the analysis. The last section will discuss the implications of the findings, propose practical recommendations and suggestions, and conclude the study.

Literature review

Green Finance and Environmental Performance

Finance involves various financial transactions carried out on daily basis. Green finance has become crucial in redirecting financial flows as such it ensures the sustainability of the environment (Rainey et al., 2023). It includes various financial instruments like green bonds, green loans, sustainability -linked loans (Mirovic et al., 2023; Neel et al., 2022). The basic aim of these instruments is to fund projects with positive impact on the environment. The link between green finance and environmental performance has been conducted by various researchers. Wen and Siddik (2023) confirmed that green finance has positive and significant effect on environmental performance. Further Mohanty et al. (2023) conducted bibliometric review on the emerging trends in Green Finance.

Growth of green industry is the main driver of economic sustainability. Further Wen and Siddik (2023) also stated that green finance has now border aspects for the organizations. Therefore, organizations must adopt various green finance practices like reduced carbon emissions, lower energy consumption and efficient waste management practices (Li et al., 2023) Thus, green finance can be treated as financial catalyst for driving the financial performance of the organizations.

Fintech Adoption and Environmental Performance

Fintech has gained a lot of attention in the recent years. The rapid adoption of fintech has caused disruption in the financial systems and it has led to innovative ways of conducting financial transactions and services. Fintech adoption aims to enhance the operational efficiency, reducing the costs and increasing the financial inclusion (Wilter et al., 2023) Its effect on environmental performance has been studied recently and limited research has been done in this connection. A study by [redacted] has studied the impact on the performance of the environment by fintech adoption in the banking sector. The research highlighted that fintech adoption has reduced paper usage, increase in digital transactions and optimization of resources thus lowering the environmental footprints for financial institutions. Thus, literature has proved that fintech adoption has become one of the important factors in supporting green objectives thus warranting further investigation along with its connection with other variables.

Green Innovation and Environmental Performance

Green Innovation can be defined as the developing and implementing new technologies, processes, products, and practices to reduce the detrimental effects on the environment and promote sustainability. The aim of green innovation is to achieve resource efficient, eco-friendly and results which are socially responsible. It involves adopting clean technologies, renewable energy resources and production methods which enhance the sustainability of organizations and society at large. In addition to this green innovation also supports businesses to maintain environmental compliance by minimizing pollution and harmful emissions. Organizations that invest in green innovation are likely to be ahead in positioning themselves as sustainable entities. In addition to this it also enhances the reputation of the organization, thus enhancing brand loyalty and increasing the customer base of those who are environmentally conscious. Long term cost saving is also of the advantages of green innovation. Thus, it can be concluded that green innovation improves financial performance by reducing the operational costs. In nutshell organizations can better address the environmental challenges if they embrace green innovation.

Employee Green Behavior and Environmental Performance

Employees are one of the most important assets of any organization and they play major part in ensuring that organizational policies and procedures are such that they confirm sustainable practices. Employee green behavior can be defined as actions and attitudes adopted by individuals and employees in specific that are sustainable and good for the organization both inside and outside the workplace. Literature has put emphasis on fostering employee green behavior to drive sustainability outcomes. A study by Bhutto et al., (2023) studied the relationship between employee green behavior and environmental performance in manufacturing companies. The research revealed that there exists positive relationship between the two variables thus indicating that employees who actively participate in green practices positively influences the overall environmental performance of an organization. This highlights the importance of doing research on employee green behaviors.

Mediating role played by Employee Green Behavior

It has been observed that individual influences of green finance and fintech adoption on environmental performance have been studied, their combined effect and the mediating role of employee green behavior needs further attention. By integrating these concepts, we can get comprehensive understanding of the mechanisms through which sustainable finance and technology adoption causes effect on environmental performance.

In addition to the prior research our paper aims to investigate how employee green behaviors mediates the relationship between green finance, fintech adoption and environmental performance. It posits that organizations that adopt green finance practices

and fintech solutions might experience enhanced environmental performance when coupled with a workforce that engages itself actively in eco-friendly practices.

Hypothesis

Employee Green Behavior mediates the positive relationship between green finance and environmental performance and Fintech Adoption and environmental performance such that the basic relationship will be more positive when employees in banking industry adopts green behavior than employees in banking industry who do not adopt green behavior.

Conceptual Framework:

Based on literature review, conceptual framework is proposed (figure 1). It illustrates the relationship among green finance, fintech adoption, green innovation, employee green behavior and environmental performance. The framework is a guide of our research methodology, and it helps in the analysis of the interconnected dynamics among these variables. Our contribution in the existing research and literature is to explore the mediating role played by the employee green behavior between the fintech adoption and green finance with environmental performance.

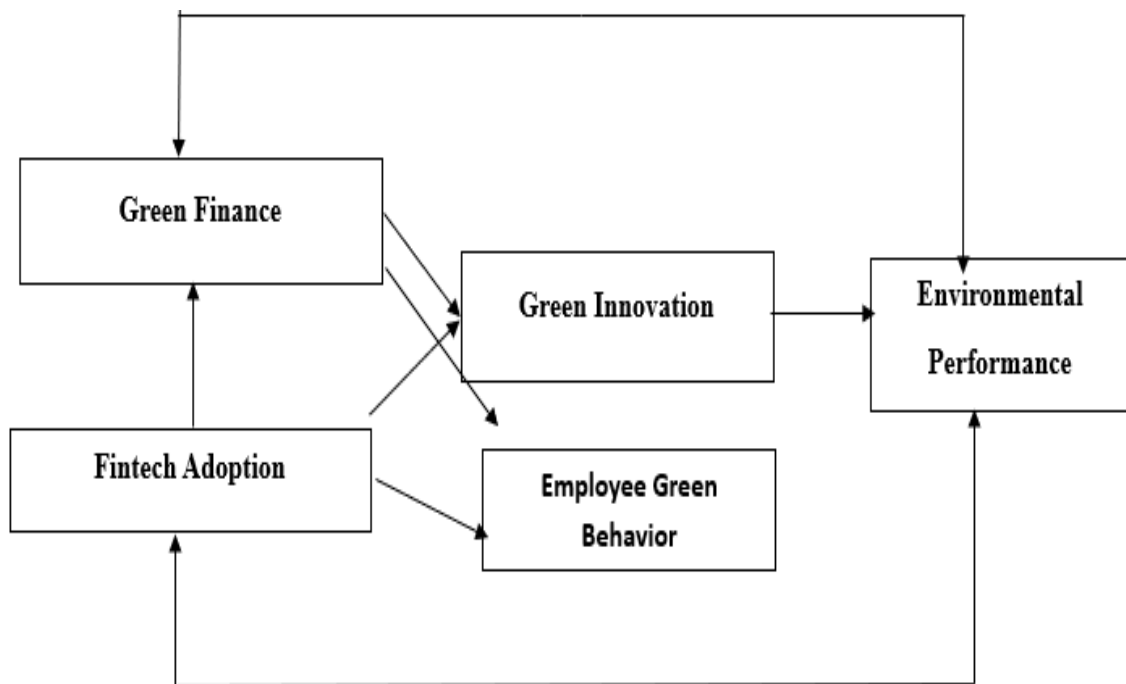


Figure 1. Conceptual framework highlighting all variables.

Materials and Methods

Our research was exploratory research. It was based on empirical data as shown in figure 2.

We collected primary data from employees working in private and public banks of Pakistan.

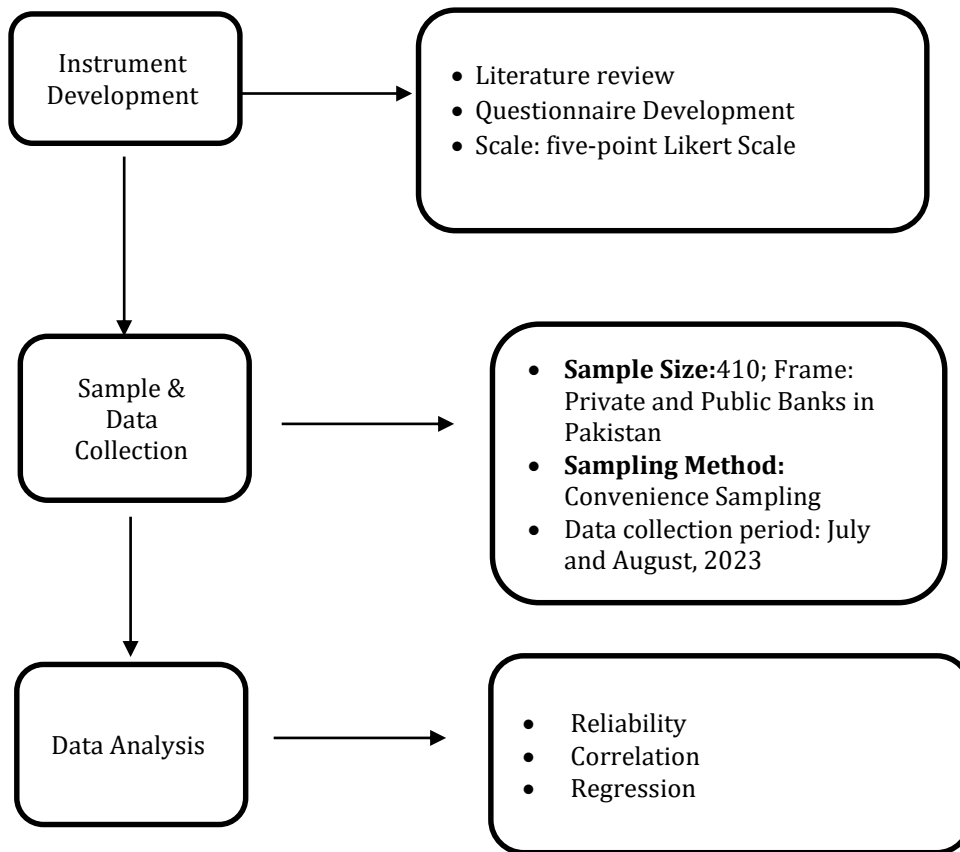


Figure 2. Flowchart depicting materials and methods.

Instrument Development

The research questionnaire items have been mentioned in the appendix. It consisted of six parts: Demographic information, Environmental performance, Green Finance, Fintech adoption, Green Innovation and Employee Green Behavior. The demographic part sought to have the basic information about respondents such as age, gender, qualification, experience, and managerial level. Fintech adoption was measured by using eight items. The scale was adopted from Nawayseh (2020). The 7-point likert scale ranging from least important to most important was used.

Green Finance was measured using six items adapted from Chen et al. (2022). A 5-point likert scale with options ranging from strongly disagree to strongly agree was utilized. Green innovation was assessed using five items adapted from (Ullah et al., 2022). A 5-point likert scale from strongly disagree to strongly agree was employed. Employee green behavior was measured across four dimensions: green learning (3 things), individual practice (4 items), influencing others (3 items), and organizational voices (3 items). All dimensions were measured on a 5-point likert scale, from strongly disagree to strongly agree. The scale was adapted from Zhang et al. (2021). The environmental performance was assessed using four items. It was adapted from Chen et al. (2022). A 5-point likert scale, spanning from strongly disagree to strongly agree, was employed. Finally, the final data collection and analysis were conducted using a standardized questionnaire with 41 measurement items.

Sample and Data Collection

The data was collected from almost 31 banks including both public and private banks. The main purpose of this research is to investigate the mediating role played by

employee green behavior between the original relationship in the context of banks in Pakistan. To fulfill the stated research objectives, primary data was collected with the help of questionnaire. Convenience sampling method was used and google form was delivered to various employees working in the banking sector of Pakistan between July 2023 to August ,2023.

Analysis

Reliability Analysis

Cronbach's Alpha measures the degree to which a set of objects are interconnected. Table 2 displays the results of the reliability study, which included 41 items, including the demographic and calculated variables, and gave a Cronbach's Alpha coefficient of 0.975. The Cronbach's Alpha coefficient has a range of 0 to 1. Since the value is near to 1, it can be concluded that it is suitable for investigation.

Table 1
Overall reliability

Total no of Items	Cronbach Alpha
41	0.975

Table 2 provides a set of variables along with their respective Cronbach's Alpha coefficients.

The results show that Fintech Adoption (0.958) has very high internal consistency among the items in the Fintech Adoption variable. The items in this variable are highly correlated with each other. The results also show good internal consistency among the items in the Green Finance variable. While the internal consistency is not as high as in Fintech Adoption, it is still considered quite good. The items of Green finance and Green Innovation are also highly correlated with one another. Environmental Performance also indicates good internal consistency among the items in the Environmental Performance variable. Similar to Green Finance, the internal consistency is good but not as high as in some other variables.

Table 2
Reliability Analysis of each variable

Variable	Cronbach Alpha
Fintech Adoption	0.958
Green Finance	0.920
Green Innovation	0.944
Employee Green Behavior	0.957
Environmental Performance	0.920

Correlation Analysis

The table provided (table 3) is the correlation matrix showing the relationships between various variables. The results shows that education has positive and significant correlation with several variables including Fintech Adoption (0.135), Green Innovation (0.193) and Employee Green Behavior (0.150). This suggests that individuals with higher education tend to have more work experience, be older, hold higher employment positions, and exhibit more financial adoption, green innovation, and employee green behavior. Financial Adoption (FA) has strong positive correlations with Green Finance (GF), Green Innovation (GI), Employee Green Behavior (EGB), and Environmental Performance (EP) (ranging from 0.605 to 0.813). This suggests that individuals who exhibit higher levels of financial adoption also tend to engage more in green finance, green innovation, employee green behavior, and environmental performance.

Green Finance (GF), Green Innovation (GI), Employee Green Behavior (EGB), and Environmental Performance (EP) also show strong positive correlations with each other (ranging from 0.686 to 0.874). This indicates that there is a significant positive relationship among these constructs, suggesting that individuals who engage in one aspect of green behavior are likely to engage in others as well.

Table 3
Correlation Analysis

	1	2	3	4	5	6	7	8	9	10
Gender	1									
Education	-0.086	1								
Work Experience	-0.035	0.294**	1							
Age	-0.210**	0.332**	0.784**	1						
Employment level	-0.132**	0.391**	0.358**	0.423**	1					
Fintech Adoption	-0.193**	0.135**	-0.059	-0.026	0.022	1				
Green Finance	-0.198**	0.031	0.009	0.048	0.093	0.724**	1			
Green Innovation	-0.200	0.193**	-0.044	0.011	0.019	0.813**	0.840	1		
Employee Green Behavior	0.277**	0.150**	0.004	0.083	0.009	0.777**	0.823**	0.874**	1	
Environmental Performance	-0.250**	0.183**	0.009	0.095	0.052	0.605**	0.686**	0.735**	0.856**	1

**Correlation is significant at the 0.01 level (2-tailed)

Regression analysis

The relationship between fintech adoption, green finance, employee green behavior (a mediating variable), green innovation, and environmental performance within Pakistan's banking industry was investigated using regression analysis.

The regression analysis's findings show that employee green behavior, green innovation, fintech adoption, and green finance all have a big impact on environmental performance in Pakistan's banking industry. Furthermore, the mediating function of employee green behavior emphasizes how crucial it is to develop a sustainable culture among staff members in order to attain favorable environmental results.

The findings show the significance of incorporating sustainability considerations into organizational practices and decision-making processes and offer insightful information about the factors influencing environmental performance in Pakistan's banking industry.

Table 4
Regression Analysis

Predictor Variable	Coefficient (β)	Standard Error	t-value	p-value
Fintech Adoption	0.680	0.083	6.027	0.000
Green Finance	0.554	0.063	6.481	0.000
Employee Green Behavior	0.780	0.083	3.979	0.000
Green Innovation	0.689	0.0630	4.120	0.000

The significance of the coefficients is usually ascertained using the t-values and p-values. The coefficient is deemed statistically significant if the p-value is less than the selected significance level (e.g., 0.05).

The regression analysis's findings offer several important new perspectives on how the banking industry in Pakistan is related to fintech adoption, green finance, employee green behavior (as the mediating variable), green innovation, and environmental performance (table 4).

The use of fintech solutions in the banking industry appears to have a considerable impact on environmental performance, according to the statistically significant coefficient for fintech adoption. This research emphasizes how technology developments propel sustainability programs in financial firms.

Green finance investments and activities lead to enhanced environmental performance, as indicated by the significant coefficient. This emphasizes the significance of incorporating sustainability into financial decision-making.

Employee green behavior is a key factor in turning fintech adoption and green finance activities into concrete environmental effects, as indicated by the significant coefficient for this variable. Fostering a sustainability culture and engaging employees in environmentally responsible practices is crucial for financial institutions.

Green innovation in the banking sector has a considerable impact on environmental performance, as indicated by the coefficient. Continuous research and development are crucial for addressing environmental concerns through new solutions.

The regression study shows that fintech adoption, green financing, staff green behavior, and green innovation increase environmental performance in Pakistan's banking sector. These findings highlight the multidimensional character of financial institutions' sustainability efforts, encompassing technological, financial, organizational, and cultural issues. To improve environmental performance, banks must take a comprehensive approach that considers multiple aspects of sustainability.

Implications

The findings have significant consequences for policymakers, financial institutions, and stakeholders in the banking industry. Strategic investments in fintech, green finance, innovation, and employee participation in sustainability practices are crucial.

To enhance sustainability, policymakers and financial institutions should emphasize implementing fintech solutions and developing green financial goods and services. Employee Green Behavior has a big impact on transforming fintech adoption and green finance initiatives into meaningful environmental consequences. Financial institutions should focus on promotion.

Employee engagement in sustainability practices through training programs and incentives structures and establishing an environmentally responsible culture. Additionally, they should prioritize research and development activities to find and implement Innovative solutions to environmental concerns. The findings also emphasize the need for financial institutions to incorporate sustainability issues into their organizational practices and decision-making procedures. This involves incorporating including environmental aspects in investment decisions, creating sustainability strategies, and implementing transparent reporting tools to monitor environmental performance.

Making significant advancements in environmental performance necessitates cooperation and interaction with different stakeholders, such as governmental organizations, civil society organizations, trade associations, and regulatory authorities. Financial institutions ought to actively interact with these parties in order to foster cooperative solutions and encourage group efforts to achieve sustainable objectives.

The results of the regression highlight how crucial it is to develop a long-term viewpoint on banking industry sustainable development. While immediate benefits are crucial, financial institutions ought to give top priority to projects and investments that support the resilience and sustainability of the environment over the long run.

Conclusion

Finally, the implications derived from the regression results highlight the need for Policymakers, financial institutions, employees, and other stakeholders are working together. To encourage sustainable practices in Pakistan's banking sector. By prioritizing investments, Fintech adoption, green finance, employee engagement, and green innovation in the financial Institutions can contribute to favorable environmental outcomes and drive long-term Value generation and resiliency.

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