



Unlocking Financial Innovation: Fintech Adoption, Knowledge Codifiability, and Employee Engagement in Developing Countries

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ABSTRACT

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Fintech has garnered significant global attention, particularly in the wake of the COVID-19 pandemic. However, its adoption in developing countries is still in its infancy. Managers within organizations constitute a crucial demographic that can significantly influence Fintech Adoption (FA). This empirical study delves into the impact of FA and Knowledge Codifiability (KC) on Employee Engagement (EE). Additionally, the study investigates the mediating role of EE in the relationship between FA, KC, and Competitiveness. Furthermore, it examines how Resource Commitment (RC) moderates the connections between FA, KC, and EE. The data was collected from 424 managers based in a developing country. The study employs PLS-SEM to analyze the relationships among these variables. The results reveal that both FA and KC have a positive correlation with EE. Moreover, the findings substantiate the idea that EE serves as a mediator in the relationship between FA, KC, and competitiveness. Additionally, the results confirm that RC plays a moderating role in the connections between FA, KC, and EE. This study offers valuable recommendations for regulators in crafting regulations that align with firms' technological goals, promoting innovation and economic growth.

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Introduction

The financial technology (Fintech) sector has witnessed an unparalleled surge in recognition and global adoption after the worldwide COVID-19 pandemic (Razi et al., 2019). The global pandemic served as a catalyst, expediting the incorporation of digital solutions across diverse sectors, such as the financial industry. Fintech, an umbrella term for a wide array of innovative technological advancements within the financial sector, has exhibited its capacity to fundamentally transform conventional financial systems, enhancing their efficiency, accessibility, and adaptability to the changing demands of enterprises and individuals (Alaassar et al., 2023). The significant capacity for transformation inherent in this phenomenon has garnered widespread recognition and acclaim globally, as it holds the potential to fundamentally alter the structure and dynamics of the financial services sector.

Developed nations have shown a high acceptance towards Fintech solutions, whereas implementing these advanced technologies in developing countries is still at an early stage (Alkhwaldi et al., 2022). Despite Financial technology's considerable potential in promoting financial inclusivity, improving operational effectiveness, and fostering economic development in these areas, numerous obstacles have impeded its extensive adoption. The sluggish pace of Fintech adoption in developing economies can be attributed to several factors, including restricted technology access, insufficient digital infrastructure, regulatory obstacles, and disparities in technological proficiency (Anagnostopoulos, 2018). Against this contextual backdrop, it is evident that managers within firms operating in developing countries play a crucial role as influential figures that can greatly affect the speed and scope of Fintech adoption. In their capacity as primary decision-makers, managers possess the requisite authority to initiate and facilitate organizational change, distribute resources, and determine the course of strategic objectives. Hence, the perceptions, attitudes, and decisions of individuals play a pivotal role in determining the successful integration of Fintech adoption within their organizations. Gaining insight into the determinants that shape managers' perspectives on adopting Fintech is an essential undertaking in comprehending the intricate dynamics underpinning this phenomenon (Senyo et al., 2023; von Horn & Kudic, 2023).

The primary objective of this empirical research investigation is to explore the intricate association between the adoption of Fintech, the Codifiability of knowledge, employee engagement, and competitiveness in developing nations. This study aims to elucidate the mechanisms by which Fintech is perceived, adopted, and implemented within organizations in these regions through thoroughly examining the complex interplay between the variables involved. The study recognizes that the Fintech landscape extends beyond technology and encompasses various organizational, cultural, and strategic dimensions that collectively shape its adoption trajectory. The primary objective of this research is to examine the effects of FA and KC on EE within the context of managers operating in developing nations. The process of Fintech adoption encompasses incorporating digital financial solutions into an organization's operational framework. On the other hand, KC pertains to the degree to which implicit knowledge can be transformed into explicit and shareable formats (Acharya et al., 2023). The selection of these dimensions is predicated on their capacity to mold the perceptions and attitudes of managers

towards Fintech, thereby potentially affecting their degree of involvement in the organizational change brought about by the adoption of Fintech.

Additionally, this research investigates the intermediary function of EE in the correlation between FA, KC, and Competitiveness. Employee engagement is a significant factor that connects the adoption of Fintech and knowledge management practices to an organization's overall competitiveness. It is defined by employees' emotional commitment and dedication towards their work. The role of EE in mediating the relationship between Fintech integration and various outcomes, such as operational efficiency, workforce motivation, innovation, and alignment with strategic goals, provides valuable insights into the complex and dynamic nature of this process. Furthermore, this research investigates the moderating influence of RC on the association between FA, KC, and EE. Resource commitment refers to allocating various organizational resources, such as financial, human, and technological assets, towards initiatives aimed at adopting Fintech (Collevecchio et al., 2023). This dimension acknowledges the critical importance of resource allocation in facilitating and maintaining Fintech-driven changes within an organization. The study utilizes a research methodology that entails collecting and analyzing data from managers operating within the context of a developing country. The study employs the PLS-SEM methodology to examine and validate the associations among Fintech adoption, knowledge Codifiability, employee engagement, and competitiveness. Utilizing this methodological approach, the study seeks to offer a thorough comprehension of the fundamental dynamics and interrelationships among these variables.

The findings of this research have significant implications for both scholarly discourse and real-world implementations. The findings of this study will make a valuable contribution to the current academic literature by providing a deeper understanding of the factors that either facilitate or impede the adoption of Fintech in developing countries. The role of employee engagement as a mediator and the effect of resource commitment as a moderator offer detailed insights into the mechanisms that influence the relationship between Fintech integration and organizational outcomes. Furthermore, the study's recommendations have the potential to provide practical guidance for regulators and policymakers in developing adaptive and supportive regulations. These regulations can effectively facilitate the adoption of Fintech in developing nations while aligning with the technological objectives of firms operating in these regions. Based on RBV theory, the study investigates the following research objectives: Firstly, to investigate the relationships between FA, KC, and EE within developing countries. Secondly, to explore the mediating role of EE between FA, KC, and competitiveness. Lastly, to examine the potential moderating effect of RC on the associations between FA, KC, and EE.

2.0 Literature Review

1.1 Fintech adoption

Fintech, which is distinguished by the introduction of technological advancements in the financial industry, has emerged as a ubiquitous influence in contemporary work environments (Gomber et al., 2018; Gomber et al., 2017). Scholars have investigated the effects of incorporating financial technology tools and platforms on levels of employee engagement. Multiple research studies

indicate a positive relationship, wherein increased utilization of Fintech within enterprises is linked to elevated levels of employee engagement. The correlation between enhanced efficiency and accessibility of financial processes and the reduction of administrative burdens, thereby enabling employees to concentrate on more engaging and strategic tasks, is a plausible explanation for this connection (Chanana & Sangeeta, 2021; Ghosh et al., 2022; Nayak et al., 2020). However, additional research is required to gain a comprehensive understanding of the intricacies of this association and ascertain any potential moderating variables that could affect its magnitude. Based on the above discussion, we propose the following hypothesis:

H₁: FA is positively related to EE.

1.2 Knowledge Codifiability

The notion of knowledge Codifiability, which refers to the degree to which organizational knowledge can be methodically documented and archived, has become a prominent subject in employee engagement research (Gottschalk, 2006; Snyder, 1996). Academic scholars have acknowledged the potential correlation between the Codifiability of knowledge and employee engagement. They propose that organizations possessing knowledge assets that are highly codifiable may possess a competitive edge in cultivating elevated levels of engagement within their workforce (Čater, 2001; Ghasemkhani et al., 2014). The justification for this correlation is rooted in the concept that when knowledge becomes readily accessible and transferrable through formalized systems and repositories, employees may encounter decreased obstacles in their work procedures, resulting in heightened levels of involvement (Battistella et al., 2016; Omotayo, 2015). The aforementioned relationship highlights the significance of implementing efficient knowledge management strategies in fostering a workforce that is more actively involved and productive (Omotayo, 2015; Snyder, 1996). Nevertheless, it is imperative to conduct empirical research to provide evidence and delve deeper into the intricacies of this association. Thus, the following is the research hypothesis:

H₂: KC is positively related to EE.

1.3 Mediating role of employee engagement

The complex relationship between the adoption of financial technology, the Codifiability of knowledge, the engagement of employees, and the competitiveness of organizations has become increasingly prominent in recent academic literature (Dada & Fogg, 2016; Mazarol & Norman Soutar, 1999). The significance of Fintech adoption and knowledge Codifiability in shaping organizational competitiveness is widely acknowledged. Previous research has proposed that employee engagement plays a crucial role as a mediator in this association. Adopting Fintech and the Codifiability of knowledge can enhance an organization's competitive advantage by optimizing processes and cultivating a culture of innovation (Lall & Teubal, 1998; Vives, 2019). Employee engagement is proposed as the intermediary between these technological and knowledge-based elements, effectively converting their advantages into enhanced competitiveness. The significance of cultivating a workforce that possesses both technological proficiency and a strong commitment to effectively utilizing these resources to attain a sustainable competitive advantage is emphasized

by this mediation framework (Azeem et al., 2021; Lado & Wilson, 1994). Additional empirical research is required to substantiate and elucidate the complexities of these relationships within different organizational settings. Thus, based on the above discussion we propose the following hypothesis:

H₃: EE mediates between FA and competitiveness.

H₄: EE mediates between KC and competitiveness.

1.4 Moderating role of resource commitment

Scholarly literature has increasingly focused on investigating the dynamics of Fintech adoption, knowledge Codifiability, employee engagement, and resource commitment. The importance of employee engagement is widely acknowledged about the adoption of financial technology (Fintech) and the Codifiability of knowledge (Lumineau et al., 2021; Oggero et al., 2020). However, the degree to which these factors influence employee engagement may depend on the level of resources that an organization is willing to allocate. Existing literature indicates that the level of commitment to resources, including financial investments, infrastructure, and allocation of human capital, has a moderating effect on the association between the adoption of financial technology (Fintech), the Codifiability of knowledge, and the engagement of employees (Alaassar et al., 2022; Yang et al., 2022). Organizations that allocate significant resources to support these initiatives are expected to observe a more pronounced positive impact on employee engagement. The significance of strategic resource allocation in maximizing the combined impact of Fintech adoption and knowledge Codifiability on employee engagement is emphasized by this moderation framework. Thus, the following are the proposed hypotheses:

H₅: RC moderates between FA and EE.

H₆: RC moderates between KC and EE.

3.0 Methodology

3.1 Measures

This study is based on five variables: FA, KC, RC, EE and competitiveness. FA based on eight items was adopted from (Cen & He, 2018). Similarly, KC was examined through five-item from (Reagans & McEvily, 2003; Zander & Kogut, 1995). Furthermore, RC includes four items adopted from (Konadu et al., 2020; Wu, 2017). Moreover, EE was measured through twelve-item from (Shuck et al., 2017). Lastly, competitiveness was measured through three items from (Camisón, 1999). Figure 1 displays the conceptual framework of the study.

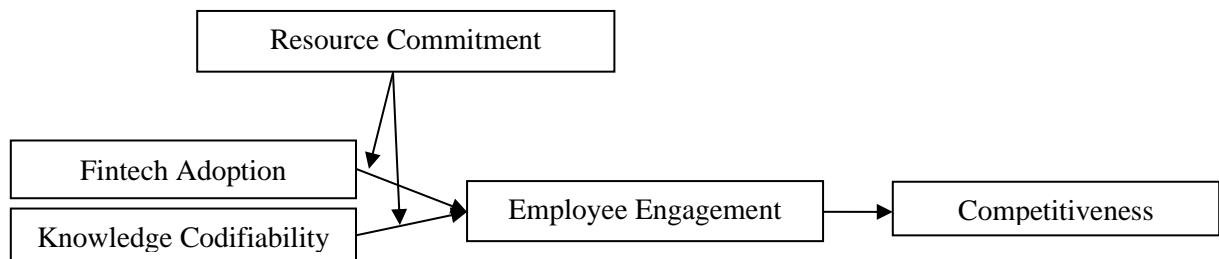


Figure 1 Research Framework

3.2 Population and Sampling

The data employed in this study was gathered from firms located in Lahore, Pakistan. The Punjab province in Pakistan is recognized as the largest province in the country, both in terms of its extensive geographical area and significant population (Riaz & Ali, 2023). The Lahore Chamber of Commerce holds a prominent position within the province, accommodating a substantial number of firms in comparison to other Chambers (Rehman et al., 2023; Riaz, Ali, et al., 2023). The sample comprises individuals in managerial positions within these firms. A preliminary assessment was conducted to establish the variables' validity, and the questionnaire underwent an evaluation to ascertain its clarity, coherence, and validity. A total of 500 questionnaires were distributed through the purposive sampling technique. A total of 429 questionnaires were collected, of which 424 were considered appropriate for inclusion in the final analysis.

4.0 Results

4.1 Model Estimation

The Partial Least Squares Structural Equation Modelling (PLS-SEM) technique is frequently utilized for hypothesis testing, often in conjunction with the SmartPLS software. There are several justifications for the utilization of PLS-SEM. PLS-SEM is a statistical methodology that effectively evaluates the existence of measurement error and offers an accurate estimation of the mediation effect. In addition, Hair et al. (2021) have acknowledged the proficiency of the PLS-SEM technique in handling models with diverse levels of complexity. We used SPSS and SmartPLS to analyze the data in this study. Furthermore, the measurement and structural models are analyzed for data validity and explanation of relationships among the constructs.

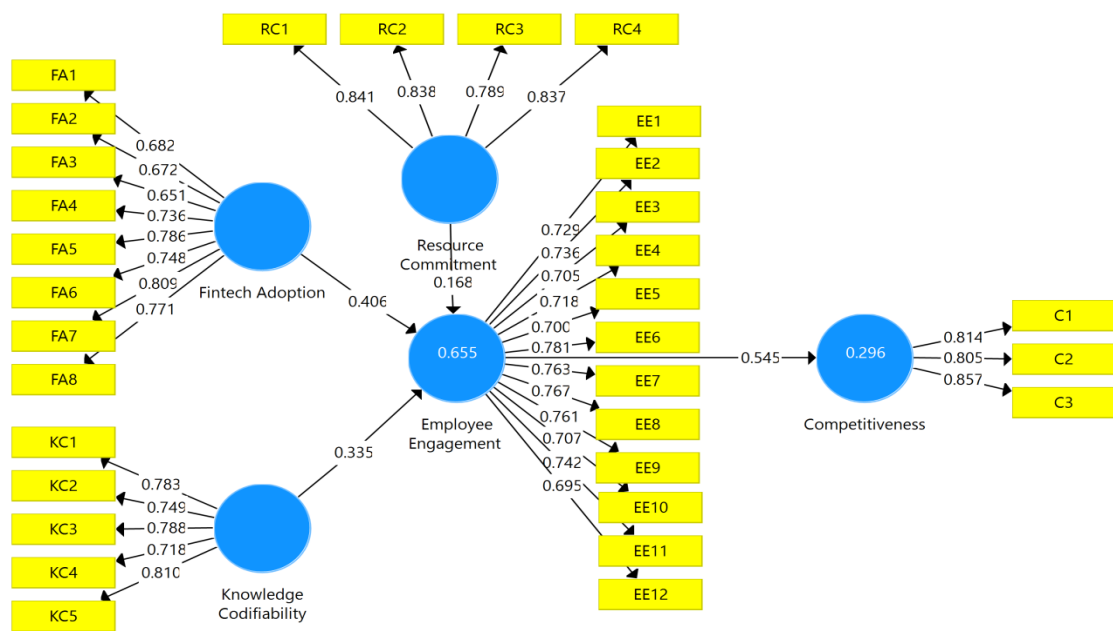


Figure 2 Measurement Model

Table 1 Convergent Validity

Constructs	Items	Factor Loading	AVE	CR	R2	α	Full Collinearity
Fintech Adoption	FA1	0.682	0.539	0.903		0.877	2.409
	FA2	0.672					
	FA3	0.651					
	FA4	0.736					
	FA5	0.786					
	FA6	0.748					
	FA7	0.809					
	FA8	0.771					
Knowledge Codifiability	KC1	0.783	0.593	0.879		0.828	1.957
	KC2	0.749					
	KC3	0.788					
	KC4	0.718					
	KC5	0.810					
Employee Engagement	EE1	0.729	0.539	0.933	0.653	0.922	1.000
	EE2	0.736					
	EE3	0.705					
	EE4	0.718					
	EE5	0.700					
	EE6	0.781					
	EE7	0.763					
	EE8	0.767					
	EE9	0.761					
	EE10	0.707					
	EE11	0.742					
	EE12	0.695					
Resource Commitment	RC1	0.841	0.683	0.896		0.845	2.448
	RC2	0.838					
	RC3	0.789					
	RC4	0.837					
Competitiveness	C1	0.814	0.682	0.865	0.296	0.767	
	C2	0.805					
	C3	0.857					

The measurement model is based on analyzing factor loadings, AVE, VIF, CR and alpha. Table 1 demonstrates that all factor loadings values are above the required threshold of 0.5 (Becker et al., 2022). Upon analyzing the data presented in Table 1, it is evident that the internal consistency reliability of the examined measures is deemed satisfactory. The claim is supported by empirical data indicating that both the CR and alpha values surpass the established threshold of 0.70. The

evaluation of convergent validity entails the application of average variance extracted (AVE), which is typically recommended to meet or exceed a threshold of 0.50, as proposed by (Hair et al., 2019). The findings presented in Table 1 and Figure 2 indicate that all constructs exhibit an Average Variance Extracted (AVE) value that surpasses the predetermined threshold of 0.50. Based on this observation, it can be inferred that the constructs meet the requirements for convergent validity.

Table 2 Discriminant validity (HTMT)

	COM	EE	FA	KC	RC
Competitiveness					
Employee Engagement	0.641				
Fintech Adoption	0.640	0.813			
Knowledge Codifiability	0.670	0.808	0.749		
Resource Commitment	0.663	0.773	0.840	0.781	

In the past, discriminant validity was evaluated using traditional metrics, as initially proposed by Fornell and Larcker (1981). The evaluation of discriminant validity is presently performed using the heterotrait-monotrait (HTMT) method, initially introduced by (Henseler et al., 2015). It is recommended to set the HTMT ratio at 0.85 for variables that exhibit distinguishable conceptual characteristics. On the other hand, it is recommended to establish a threshold of 0.90 for variables that demonstrate similarities. The empirical evidence provided in Table 2 indicates that the established standards for discriminant validity have been satisfied.

Table 3 Hypotheses Testing

Hypotheses	Paths	β -values	t-values	p-values	Remarks
H1	FA → EE	0.197	3.399	0.001	Yes
H2	KC → EE	0.174	3.428	0.001	Yes
H3	FA → EE → Competitiveness	0.107	3.303	0.001	Yes
H4	KC → EE → Competitiveness	0.095	3.263	0.001	Yes
H5	FA*RC → EE	0.396	8.273	0.000	Yes
H6	KC*RC → EE	0.192	4.090	0.000	Yes

The diagram in Figure 3 depicts the structural model. The findings presented in Table 3 demonstrate that there is a statistically significant positive relationship between FA and EE, as evidenced by the beta coefficient of 0.197 and the t-value of 3.399. These results provide support for Hypothesis 1. In a similar vein, it can be observed that KC plays a substantial role in determining EA, as evidenced by the beta coefficient of 0.174 and the corresponding t-value of 3.428. This finding provides support for hypothesis H2. Moreover, the findings from the mediation analysis reveal that EE plays a significant mediating role in the relationship between FA ($\beta=0.107$ and $t=3.303$), as well as KC ($\beta=0.095$ and $t=3263$), and competitiveness. These results provide empirical support for hypotheses H3 and H4, respectively. Furthermore, it was determined that the moderation effect of FA*RC on the association between FA and EE exhibited statistical significance ($\beta=0.396$, $t=8.273$). The study observed a statistically significant moderation effect of KC*RC on the relationship between KC and EE ($\beta=0.192$ and $t=4.090$),

thereby providing support for H5 and H6, respectively.

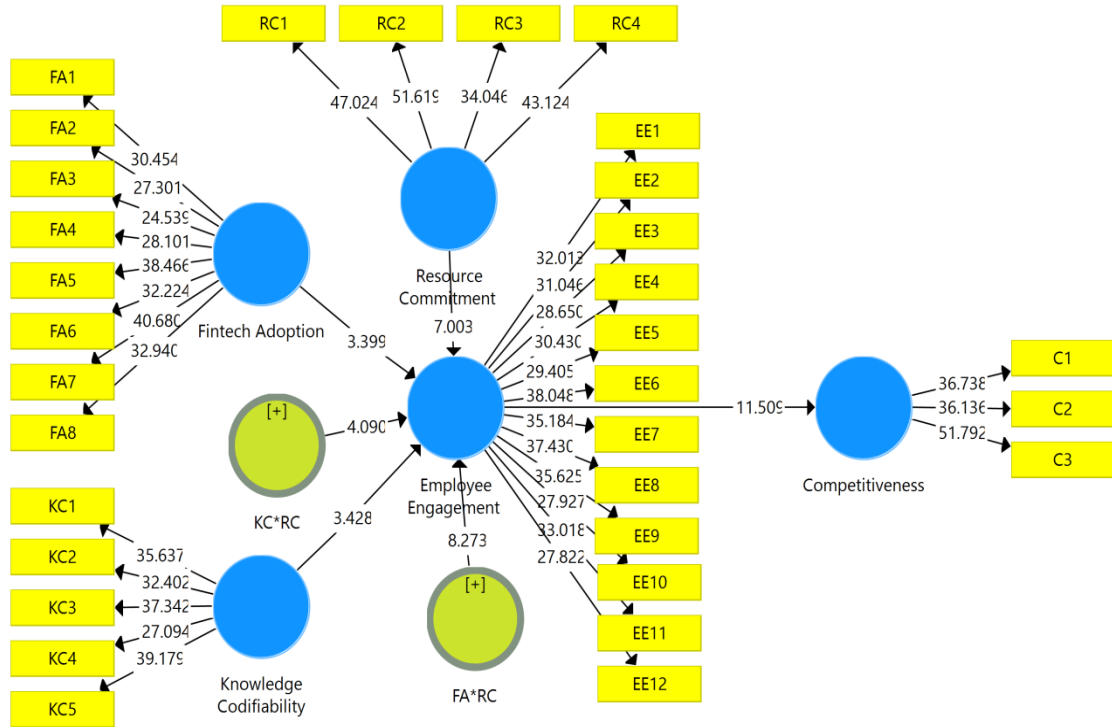
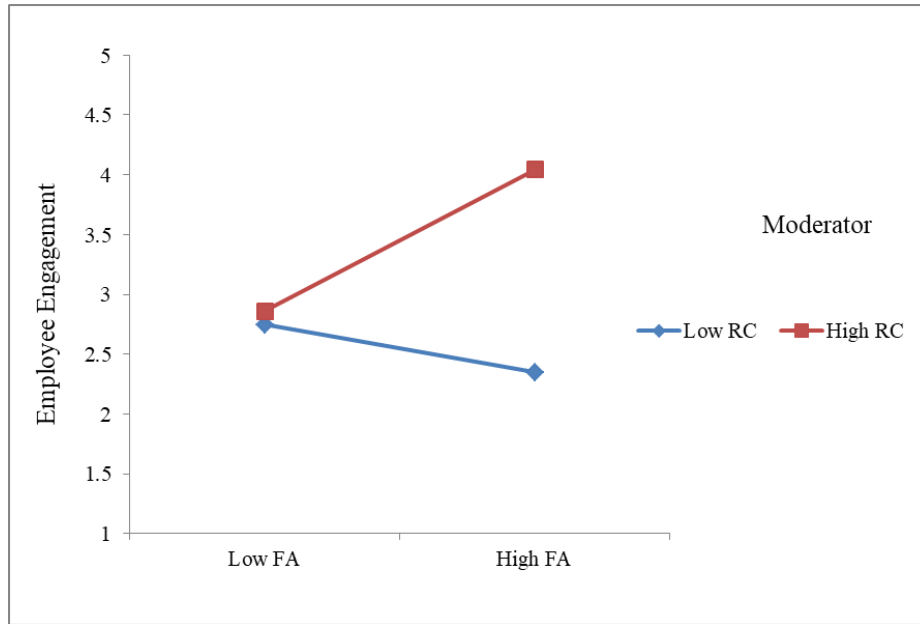


Figure 3 Structural Model

5. Discussion

The findings of the empirical study have substantial implications for various stakeholders engaged in the domain of Fintech adoption in developing nations. The global recognition of Fintech adoption has significantly increased after the COVID-19 pandemic. Nevertheless, the initial implementation of this technology in developing countries highlights the considerable opportunity for expansion. It is worth noting that managers within firms play a crucial role in influencing FA. A positive correlation between FA and EE highlights the strategic importance of adopting financial technology solutions within organizations. For managers, this suggests that integrating Fintech is not solely a technological enhancement but also a strategy to cultivate increased employee motivation and dedication.



6.

Figure 4 Moderating effect of RC between FA and EE

Additionally, the research emphasizes the positive correlation between KC and EE. This implies that the implementation of codification as a means to enhance knowledge management can be a crucial strategic approach for organizations. Implementing strategies that capture and disseminate implicit knowledge about Fintech can greatly enhance the efficiency of adoption procedures and enhance levels of employee involvement. The study makes a significant contribution by revealing that EE is a mediator between FA, KC, and competitiveness. Companies seeking to improve their competitive advantage through adopting financial technology must acknowledge the pivotal role of EE. By fostering a conducive environment for engagement, companies can establish a receptive backdrop for integrating financial technology and disseminating knowledge, thus enhancing their competitive position.

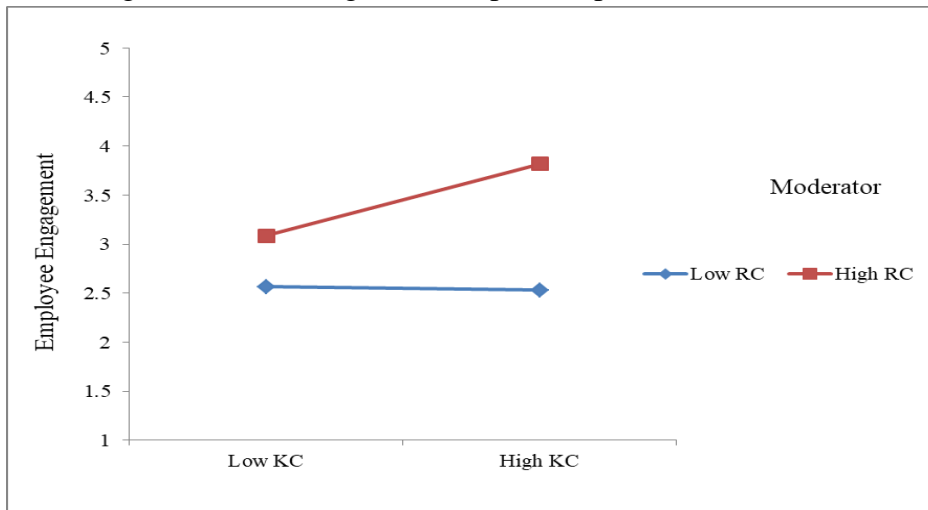


Figure 5 Moderating effect of RC between KC and EE

The study additionally emphasizes the importance of regulators aligning their regulations with the technological aspirations of firms. Policymakers possess the capacity to assume a crucial role in facilitating Fintech adoption through establishing a conducive ecosystem. Implementing streamlined regulations, robust data security protocols, and appropriate incentives can effectively facilitate a smooth and efficient adoption of digital financial services, resulting in advantageous outcomes for both financial institutions and consumers. Additionally, the research highlights the role of RC as a moderating variable. This underscores the importance of efficient allocation of resources to achieve successful adoption of Fintech and enhance employee engagement. Organizations must conduct a thorough evaluation and strategic allocation of resources to effectively achieve the desired levels of engagement and competitive advantage through the integration of Fintech. Given the early stage of Fintech implementation in developing nations, this study underscores the significance of capacity development and training programs. These initiatives can provide managers and employees with the necessary skills to effectively utilize Fintech tools. This approach not only guarantees successful financial analysis but also improves the firm's environmental efficiency and overall competitiveness.

In conclusion, the study's findings indicate that it is advisable to embrace a comprehensive and extended outlook on the concept of competitiveness. The integration of Fintech should be regarded as an essential component of a company's overarching long-term strategy. Sustained endeavours are necessary to actively involve employees, enhance technological expertise, and respond to dynamic market trends. In summary, the implications of this empirical study offer practical guidance for managers, regulators, and policymakers as they navigate the dynamic landscape of Fintech adoption in developing nations. The insights provided by this study offer a comprehensive perspective on the complex interconnections that influence the dynamics of financial accounting, knowledge creation, environmental efficiency, and competitiveness

Sania Saeed: Problem Identification and Model Development

Sabra Munir: Literature search, Methodology

Fouzia Hadi Ali: Supervision and Drafting

Conflict of Interests/Disclosures

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