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Research paper

The Impact of Fintech Innovation on Operational Efficiency: The Mediating Role of Organizational Agility in KSA Financial Institutions

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Abstract

The objective of the study is to consider the impact of fintech innovation on the operating efficiency of the financial institutions in the KSA, specifically, through the mediating role of organizational agility. The paper discusses the relations between fintech innovation and organizational agility and operational efficiency based on the filled questionnaires sent to both the managerial and operational teams across the various types of financial institutions in KSA. The theories that lay the principles of the Resource-Based View (RBV), as fintech is being seen as a technological resource, and the Dynamic Capabilities Theory (DCT), as agility is seen as a capacity that companies can apply to restructure their resources, underpin the research. These results imply that operational efficiency has a considerable positive impact on fintech innovation, and this effect is partially mediated by organizational agility. In that way, the richest subjects tend to implement fintech innovations to optimize the operating efficiency and performance. It is emphasized that technology innovation and business agility, as the strategic enablers of sustainable effectiveness, are crucial to consider in the study. Practical Implications: KSA FIs should also invest in recent digital tools and technologies and develop and sustain agile organizational architecture and agility capacity. Second, regulators are recommended to establish more flexible systems to facilitate organizational agility and resilience in the financial sector in the face of continuous digital transformation.

Keywords: *Technological Advancements; Digital Payment Systems; Financial Inclusion Tools; Operational Efficiency; Organizational Agility.*

1. Introduction

Over the past decade, fintech has transformed how financial services are organized and delivered globally (Abu-AlSondos et al., 2024; Allahham, Sharabati, et al., 2024). It has redefined the architecture of operational efficiency in the financial sector. New technologies such as AI, blockchain, robotic process automation (RPA), and mobile banking are increasingly necessary to speed up service delivery, decrease costs, and control internal processes (Sharabati et al., 2024; (Morshed et al., 2024; Salhab et al., 2023). These developments are significant for financial banks in KSA as there are pressing demands for the need to be agile, efficient, and integrative digital technology for the Kingdom of Saudi Arabia, which are closely related to Vision 2030 goals (Al-Baity, 2023). Though fintech innovation has great potential to improve operational performance, its implementation will be successful only if an organization can respond to technological and environmental changes quickly (Al-Omoush & Alsmadi, 2024; Alblooshi, 2022). This capacity, identified as organizational agility, reflects how an organization can sense external change, market opportunities, and regulatory activities, and subsequently act appropriately and strategically (Nafei, 2016). Organizational agility enables the effective integration of digital technologies and continuous alignment with shifting customer needs and regulatory requirements(Lu & Ramamurthy, 2011). While fintech technologies have been adopted across Gulf-region institutions, there is limited empirical evidence on how organizational agility mediates their impact(Shehadeh et al., 2024). In an increasingly complex regulatory landscape, with a changing customer climate and burgeoning demands on digital infrastructure, agility is no longer a luxury but a strategic imperative (Allahham, Sharabati, et al., 2024). Financial institutions may be unable to take full advantage of this fintech-related transformation if they do not have the structural agility to kindle innovation(Hatamlah et al., 2023). Therefore, examining agility on how fintech can leverage it to improve operational performances is germane in making informed strategic decisions and in steering efficient digital transformation (Ononiwu et al., 2024). Nevertheless, limited or no studies have examined the mediating role of organizational agility on the association of fintech adoption with operational efficiency in this unique institutional and regulatory environment in Saudi Arabia. This is the gap this paper aims to bridge by exploring how fintech innovation is related to organizational agility as well as operational efficiency in the context of the financial services in the Kingdom of Saudi Arabia (KSA). The research questions guiding this study are:

- RQ1: To what extent does fintech innovation influence operational efficiency in KSA financial institutions?

- RQ2: How does organizational agility affect the relationship between fintech innovation and operational efficiency?
- RQ3: Does organizational agility serve as a significant mediating factor in enhancing the impact of fintech innovation on operational efficiency?

This research is structured as follows: Section 2 presents a comprehensive review of the relevant literature concerning the topic. At the end of the literature review section, we propose the hypotheses regarding the mediating effect of agility on the association between fintech and efficiency in Saudi financial institutions. Section 3 presents the methodology, explaining the survey design, data collection, and the use of PLS structural equation modeling to examine the hypothesized relationships. Results of the empirical analysis are reported in Section 4 and compared to prior studies. Connections: Section 5 concludes with a discussion of the theoretical contributions and practical value of aligning fintech innovation and agile organizational practices for improved operations in the Saudi banking and financial industry. The results provide practical support for institutions in adopting internal processes and becoming more adaptable to ensure their competitiveness in a transforming digital world.

2. Literature Review and Hypothesis Development

2.1. Technological advancements and operational efficiency

The financial services industry has evolved significantly due to the fast pace of fintech development, which has transformed how financial institutions operate and deliver value(Abu-AlSondos et al., 2023; Shan et al., 2022; Thuneibat et al., 2022). Key technologies such as artificial intelligence (AI), blockchain, big data analytics, and digital payment systems enable financial institutions to reengineer their internal operation, reduce transaction costs, and enhance the quality and speed of decision-making (Alawadhi et al., 2022; Ali et al., 2024; Salhab et al., 2023). In this light, digital payment technologies utilizing real-time transaction processing systems and mobile banking services appear to have had a significant effect on accelerating transaction rates, minimizing manual processing, and preventing operational risks in financial institutions (Aljabari et al., 2024). In a country like Saudi Arabia, financial institutions must operate efficiently to stay competitive and comply with the performance objectives established by Vision 2030. Fintech serves as a strategic internal driver of operational improvement(Allahham, Sharabati, et al., 2024). Such technologies also promote more general financial inclusion by facilitating banking in under-banked areas, fostering transactions at a distance, and reducing dependence on physical banking (Saudi Central Bank, 2023). Specifically, operational efficiency means an organization can deliver services of satisfactory quality at the lowest possible cost(Allahham, Sabra, et al., 2024). In rapidly evolving digital financial landscapes across Saudi Arabia, many in the industry see fintech as a strategic means of becoming more efficient and adopting operational models that are more agile and transparent (Hatamlah et al., 2023).
H1: Fintech innovation has a positive influence on operational efficiency in KSA financial institutions.

2.2. Financial inclusion tools and organizational agility

Financial inclusion Fintech services The use of Fintech products in the financial inclusion efforts has propelled massive progress in enhancing access to finance among the yet unbanked and underbanked people and communities (Alrabei et al., 2022). Such product innovations include mobile wallets, which, in addition to expanding financial inclusion (Alrjoub et al., 2021), are also answering the sales developmental priorities of Saudi Arabia, such as Inclusive growth and equal access to finance (World Bank, 2022). To leverage the technologies to the benefit of the financial institutions, organizational agility becomes an important concern (Lestyowati, 2024; Alkhazaleh et al., 2023). This capability shows how well an organization can note change on a macro-level and respond in a timely and suitable way. Agility is the difference between turning fintech ideas into sources of action in the current fast-changing markets, such as finance, where consumer expectations are creatures that change and whose regulatory environment keeps on changing. (Sahid et al., 2023). Distributed decision-making, hybrid organizational teams, and adaptive execution processes are key features of agile organizations that allow them to adopt digital tools with little or no disruption. Digital transformation and regulatory reform are national priorities; institutional agility enables organizations to test new ideas, adapt strategies, and scale successful fintech initiatives (Atta et al., 2023). Moreover, as regulatory reform progresses, institutional agility is crucial for businesses to adjust their strategies, test new ideas, and scale up successful fintech initiatives(George, 2024). This agility further improves the level of fit with technology, resulting in operational improvements.
H2: Organizational agility has a positive influence on operational efficiency in KSA financial institutions.

2.3. Fintech innovation and the mediating role of organizational agility

Although fintech innovation holds strong potential to streamline operations, realizing this potential largely depends on internal organizational capacities, where organizational agility is necessary. Recent studies also identify agility as a mediating variable affecting the relationship between IT and entrepreneurship (Tien et al., 2020). The integration of fintech usually results in shorter implementation times, better customer service, and a better match between digital initiatives and strategic goals(Abu-AlSondos et al., 2023; Sharabati et al., 2024; Saksonova & Kuzmina-Merlino, 2017; Shan et al., 2022). On the other hand, less agile institutions may face longer integration timelines, pushback, and slower realization of the promised benefits, which can undermine the value of fintech implementation(Gehler, 2005). In a country like Saudi Arabia, home to the next stage of technology, where both public and private sectors have come together to drive innovation at an unprecedented pace, Agility provides financial institutions with both the platform for digital transformation and the internal flexibility to translate innovation into tangible business outcomes (Abedalrhman & Alzaydi, 2024). As a result, organizational agility allows fintech to play the role of a technological catalyst rather than just a technological add-on, for strategic and operational progress.
H3: Organizational agility mediates the relationship between fintech innovation and operational efficiency in KSA financial institutions.
These propositions are based on the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT). RBV posits that resources, like fintech technologies, become valuable only when paired with organizational capabilities. In this research, fintech innovation is defined as a technological capability that could contribute to the operational performance when appropriately utilized. DCT upholds this view by focusing on the centrality of dynamic capabilities – like organizational agility – that enable firms to reconfigure resources in the face of environmental turbulence. Hence, we propose that fintech innovation enhances operational efficiency (H1), agility as a dynamic capability enhances efficiency effects (H2), and agility mediates the relationship between fintech and performance (H3).

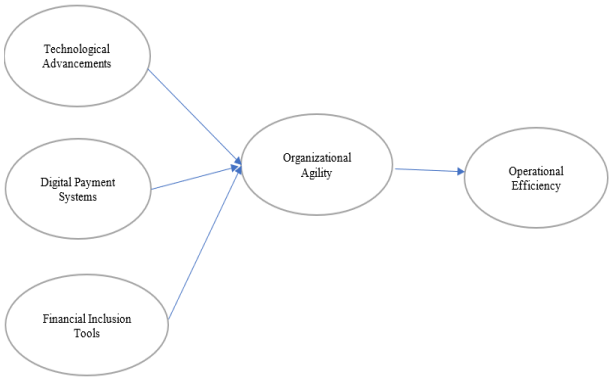

Fig. 1: Research Model.

3. Data and Sample

The sample of this study was extracted from financial firms in KSA that operated between 2013 and 2023. The official publications published by the Saudi Central Bank (SAMA) and financial statements extracted by Tadawul (Saudi Stock Exchange) were used as primary data sources. The starting sample consisted of all commercial listed banks on Tadawul during this period. To ensure robust results, non-reporting institutions (those without financial records) were excluded from the study. Consequently, the final sample consisted of 12 Saudi commercial banks that met the inclusion criteria. The sample encompasses financial and non-financial indicators related to technological innovation and changes in electronic payment systems, financial inclusion, and sustainability performance indicators. This rich dataset provides a solid foundation for investigating the impact of technological innovation and digital transformation on the operational efficiency of Saudi financial institutions.

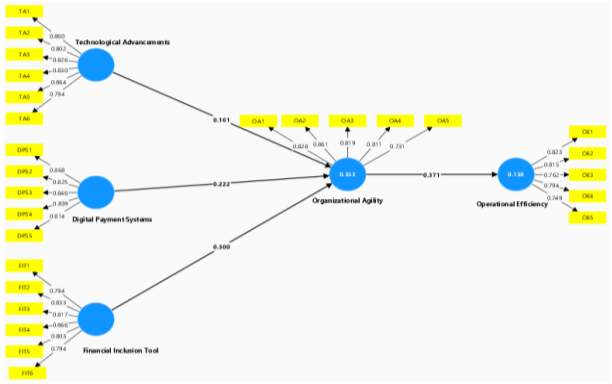

Fig. 4: Research Model.

The research model illustrated in the figure represents the structural relationships between Technological Advancements, Digital Payment Systems, and Financial Inclusion Tools as predictors of Organizational Agility, which in turn influences Operational Efficiency in Saudi financial institutions. The model emphasizes the mediating role of Organizational Agility, supported by the fact that the path coefficient from Organizational Agility to Operational Efficiency was statistically significant (β = 0.371). While Digital Payment Systems (β = 0.222) and Financial Inclusion Tools (β = 0.300) show significant influence on agility, Technological Advancements (β = 0.151) did not exhibit a statistically significant effect. The structural model aligns with the PLS-SEM methodology and supports the hypothesized relationships the importance of internal capabilities in leveraging fintech for improved operational outcomes.

Table 1: Measurement Items and Reliability

Constructs	Items	Factor loadings	Cronbach's Alpha	C.R.	(AVE)
Digital Payment Systems	DPS1	0.868	0.894	0.922	0.703
	DPS2	0.825			
	DPS3	0.846			
	DPS4	0.839			
	DPS5	0.814			
Financial Inclusion Tool	FIT1	0.794	0.901	0.924	0.669
	FIT2	0.833			
	FIT3	0.817			
	FIT4	0.866			
	FIT5	0.803			
	FIT6	0.794			
Operational Efficiency	OA1	0.828	0.852	0.892	0.623
	OA2	0.861			
	OA3	0.819			
	OA4	0.811			
	OA5	0.731			
Organizational Agility	OE1	0.823	0.869	0.906	0.658
	OE2	0.815			
	OE3	0.762			
	OE4	0.794			
	OE5	0.749			

Technological Advancements	TA1	0.86	0.909	0.93	0.689
	TA2	0.802			
	TA3	0.826			
	TA4	0.83			
	TA5	0.864			
	TA6	0.794			

As shown in Table 1, the results indicate a high degree of reliability and convergent validity for all five constructs: Digital Payment Systems, Financial Inclusion Tools, Operational Efficiency, Organizational Agility, and Technological Advancements. For all constructs, the Cronbach's Alpha values (0.852-0.909) and Composite Reliability scores (0.892-0.93) exhibit a high degree of internal consistency. This is also supported by the observation that all factor loads are above 0.7, suggesting that items were appropriate to represent their corresponding constructs. All AVEs exceed the recommended levels (≥ 0.623), supporting convergent validity and proving that each measure explains an adequate amount of variance in its measurement items. Digital Payment Systems (AVE = 0.703) and Technological Innovations (AVE =0.689) stand out with a relatively high construct reliability and item consistency. While no factor loading is below the conventional cutoff, slight deviation is evident for measures such as OE5 (0.749) and TA2 (0.802), and it might be of interest to monitor the robustness of these across future iterations. All in all, the measurement model appears to be sound and reliable, and it is ready for further SEM analysis and hypothesis testing.

Table 2: HTMT

	Digital Payment Systems	Financial Inclusion Tool	Operational Efficiency	Organizational Agility	Technological Advancements
Digital Payment Systems					
Financial Inclusion Tool	0.601				
Operational Efficiency	0.458	0.716			
Organizational Agility	0.545	0.608	0.412		
Technological Advancements	0.663	0.818	0.656	0.58	

The correlations of constructs that are the central focus of the research, Digital Payment Systems, Financial Inclusion Tools, Operational Efficiency, Organizational Agility, and Technological Advancements, using HTMT ratios are presented in Table 1 below. The minimum and maximum values of the HTMT are between 0.412 and 0.818, which indicates that there are moderate to strong inter-construct relationships in general. The nearest correlation is between Technological Advancements and Financial Inclusion Tools (0.818), which implies that there is a substantial and complementary connection between technology and the approaches that the policies on inclusion have taken to ensure wider access to financial services. Another comparatively high correlation is noted in Technological Advancements and Digital Payment Systems (0.663), yielding the positive pressure of technological updates on payment system infrastructure. At the lower level, Organizational Agility and Operational Efficiency (0.412) have the lowest HTMT value, which is still acceptable; however, it may imply a relatively clear distinction between those constructs in the model. The relatively low HTMT values observed for the dataset, namely Financial Inclusion Tools with Organizational Agility (0.608) and Financial Inclusion Tools with Operational Efficiency (0.716), further validate the importance of each construct and provide evidence for discriminant validity. As none of the HTMTs exceed the very conservative cut-value (0.85), the findings support sufficient discriminant validity between constructs in this research, revealing that each one measures a separate, unique concept, which is acceptable by standard measurement criteria.

Table 3: Fornell-Larcker

	Digital Payment Systems	Financial Inclusion Tool	Operational Efficiency	Organizational Agility	Technological Advancements
Digital Payment Systems	0.838				
Financial Inclusion Tool	0.545	0.818			
Operational Efficiency	0.388	0.609	0.789		
Organizational Agility	0.482	0.541	0.371	0.811	
Technological Advancements	0.601	0.745	0.555	0.518	0.83

Fornell-Larcker Discriminant Validity Assessment: This table presents the Fornell-Larcker criterion values for assessing discriminant validity among the five constructs: Digital Payment Systems, Financial Inclusion Tools, Operational Efficiency, Organizational Agility, and Technological Advancements. On the diagonal lie the square roots of Average Variance Extracted (AVE) of each construct, and off-diagonal indicate the correlations between constructs. The square root of the AVE of each construct is greater than the inter-construct correlation, which shows good evidence of discriminant validity. For example, the square root of AVE for Digital Payment Systems is 0.838, which is higher than its correlation to any other constructs (in particular, Technological Advancements at 0.601 and Financial Inclusion Tools at 0.545). Likewise, Financial Inclusion Tools (0.818) exerts greater internal consistency than that of its associations with Operational Efficiency (0.609) and Organizational Agility (0.541). F2, i.e., Technological Advancements (0.83), has the highest factor loading with Financial Inclusion Tools (0.745) and Digital Payment Systems (0.601), with still less value than the square root of AVE, suggesting the discriminant validity of this factor. On the lower end, Organizational Agility (0.811) and Operational Efficiency (0.789) maintain moderate correlations (0.371 and 0.555, respectively), but both constructs meet the discriminant validity criterion. The results indicate that each construct shares more variance with its indicators than with other constructs in the model, satisfying the Fornell-Larcker criterion and supporting the structural integrity of the measurement model.

Table 4: R2 Adjusted

Variable	R-square	R-square adjusted
Operational Efficiency	0.138	0.135
Organizational Agility	0.353	0.346

Table 4: Goodness-of-fit (R^2 and Adjusted R^2): Table 4 shows the R^2 and R^2 adjusted values of two dependent variables: Operational Efficiency and Organizational Agility. These values reflect the percentage of the variance of each construct captured by its predictors in the structural model. For Operational Efficiency, the R^2 is 0.138 and adjusted R^2 is 0.135. This indicates that the independent variables in

the model account for about 13.5% of the variance in operational performance. This is a low explanation, but still a significant one, especially in behavioral and organizational studies in which numerous external variables and noise make high R^2 levels unfeasible. For Organizational Agility, the R^2 value is 0.353, and the adjusted R^2 is 0.346, which shows that predictors for this variable can explain 34.6% of the variance. This indicates a moderate explanatory power, suggesting that the incorporated antecedents (e.g., technological developments, financial inclusion facilitators) can partly influence the agility in the Saudi banking industry. In sum, the R^2 and adjusted R^2 statistics for this model provide evidence for the utility of the structural model and, at the same time, indicate potential regions where the model can be extended to increase explanatory power.

4. Path Result

Table 6: Hypothesis Testing Estimates

	Original sample	Standard deviation	T statistics	P values	Result
Digital Payment Systems -> Operational Efficiency	0.083	0.032	2.618	0.009	Supported
Digital Payment Systems -> Organizational Agility	0.222	0.071	3.134	0.002	Supported
Financial Inclusion Tool -> Operational Efficiency	0.111	0.047	2.377	0.017	Supported
Financial Inclusion Tool -> Organizational Agility	0.3	0.09	3.348	0.001	Supported
Organizational Agility -> Operational Efficiency	0.371	0.086	4.297	0	Supported
Technological Advancements -> Operational Efficiency	0.06	0.038	1.574	0.115	Unsupported
Technological Advancements -> Organizational Agility	0.161	0.087	1.847	0.065	Unsupported

Testing of hypotheses: Table 6 represents the structural path analysis findings, including path coefficients, standard deviations, t-values, p-values, and hypothesis testing results. The results show that 5 out of 7 hypotheses are statistically significant at $p < 0.05$. A statistically positive relationship exists between Digital Payment Systems and Operational Efficiency ($\beta = 0.083$, $p = 0.009$), with increased digital payment infrastructure leading to moderate improvements in operational performance. Digital Payment Systems and Organizational Agility ($\beta = 0.222$, $p = 0.002$) also exhibits a statistically significant and moderate positive relationship, confirming the association of the payment systems with the agility of the organization. Both results are likewise highly correlated with financial inclusion tools. The Path to Operational Efficiency ($\beta = 0.111$, $p = 0.017$) is also supported; it presents in an even more intense way its relation with Organizational Agility ($\beta = 0.300$, $p = 0.001$), which reveals that there is a greater availability of financial inclusion tools that help the development of organizational agile practices in finance. Still, the most considerable effect was the one between Organizational Agility and Operational Efficiency ($= 0.371$, $p = 0.000$) that concentrated the mediation effect even more, reinforcing the key role of agility as a driver of the performance improvement process to Operational performance.

5. Findings

6.1. Empirical results

The paper discusses how fintech innovativeness can change the operational efficiency of Saudi financial institutions; the moderating role of organizational agility is also considered. PLS-SEM analysis results reveal that most postulated relationships are significant and prove the model. And finally, fintech innovation has been an essential and positive trend towards operational efficiency, enhancing efficiency through accelerating transactions, automating processes, and enhancing service. Furthermore, organizational agility was a significant predictor, indicating that organizations capable of sensing and responding to changes are better equipped to capitalize on digital transformation. In addition, the mediating test confirms that organizational agility plays a partial mediating role between fintech innovation and operational effectiveness. This indicates that agility is not merely a supporting factor but a critical enabler to reveal the actual value of fintech investments. These results suggest that fintech innovation, when effectively integrated with the agile nature of the institution, yields improved internal performance and greater flexibility. In contrast, slower-moving institutions may implement the same technologies but fail to achieve the same performance returns. These findings are consistent not only within the GCC but also in broader international contexts. For instance, a 2025 study on generative AI adoption across financial institutions shows that successful implementation is driven by strategic agility coupled with strong governance structures (Hettiarachchi, 2025). Interoperability standardization enhances the efficiency gains of fintech innovation, while also enabling firms to rapidly adjust their operations to meet regulatory demands. By aligning our results with these international findings, we underscore that organizational agility as a mediator between fintech innovation and operational performance is a phenomenon observable across diverse regulatory and cultural environments.

6.2. Theoretical implications

This research contributes to the body of knowledge by integrating fintech with organizational agility and operational efficiency in the context of the Saudi banking sector. It also adds to the theoretical level in that it provides the empirical data that dynamic capabilities, and especially organizational agility, can have a strong mediating role in terms of the relationship between technological innovation and organizational performance. Finally, the findings of the empirical research are also a supplement to the two mechanisms as they investigate the mediating effect of agility in the fintech technological performance of input to output through strategic value. Besides, empirically, it suggests evidence on the mediating nature of agility and, therefore, space is given to the discourse of the linear modelling of the innovation impact and the beckon of a much finer discourse of how organizational contingency mediates value capture using digital tools. The consideration of direct and indirect impacts in the mediation model has the potential to enhance a better conceptualization of the relationship between fintech and performance that can be used in future studies, although possibly extended to other industries or nations.

6.3. Managerial implications

The findings hold several practical implications for executives in Saudi financial institutions. While fintech adoption is essential for improving operational efficiency, its benefits are amplified in organizations that demonstrate a high degree of agility. Therefore, managers should focus not only on acquiring advanced financial technologies but also on cultivating a flexible and responsive organizational culture. This includes empowering cross-functional teams, decentralizing decision-making, and investing in training programs that enhance change-

readiness. Managers should treat agility as a strategic capability, not as secondary to technology acquisition. Furthermore, aligning technological innovation with organizational agility can help institutions respond more effectively to regulatory shifts, market fluctuations, and evolving customer expectations in the Saudi banking landscape.

6.4. Limitations of the study

There are several limitations to the current study, despite its contribution. First, the sample is restricted to commercial banks in Saudi Arabia. Therefore, the findings may not be generalizable to other sectors of the financial industry, such as insurance companies, investment institutions, and emerging fintech companies. However, knowledge based on this research may apply to other non-bank financial institutions such as insurance firms, investment management companies, and fintech ventures. There is also a pending pressure to introduce digital technologies and simultaneously work in a more effective manner in the face of dynamic regulatory and market environments. Insurance organizations are utilizing digital solutions to process claims and self-learned AI models to assess risk, and investment firms are using FinTech to improve their trading process and offer better customer service. The processes that were identified in our study, specifically the mediation effect of organizational agility in the benefits of fintech innovation, would thus be expected to be generalizable with minor changes between sectors. Subsequent research involving non-bank entities would be beneficial to get the difference in the regulatory environment, risk profile, and the dynamics of the system use.

6.5. Conclusions

The results of this study provide empirical data to prove the point that to achieve a successful fintech innovation to enhance the efficiency in operations in the Saudi financial services, organizational agility is a vital requirement. Just the use of fintech can increase performance a notch, and even more with the addition of agile capabilities. The findings highlight the fact that agility is the linkage between innovation efforts and the implementation of operational successes, and assists in converting digital instruments into practical customer and financial outcomes. In the current digital financial environment, with financial services companies seeking to remain relevant in a rapidly changing environment, technology and responsiveness invested jointly should become a strategic necessity. The research presents the initial model that establishes a starting theoretical foundation to investigate the processes behind the digital transformation and therefore offers a foundation on which future studies may continue the investigation of the dynamic capabilities of the digital transformation in the financial services.

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