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The impact of FINTECH on banking performance: Evidence from middle eastern countries

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A B S T R A C T

This study investigates the mediating role of competitiveness in the relationship between FinTech adoption and banking performance in the Middle Eastern region. A quantitative research design is employed, utilizing survey data from banking professionals across multiple countries. The data is analyzed using PLS-SEM modelling. The results show a positive and statistically significant impact of FinTech integration on the competitiveness of financial institutions and the performance of banks. On the other hand, the mediation of competitiveness is involved in the process of FinTech adoption and bank efficiency, suggesting that banking institutions that can utilize FinTech advantageously have greater chances of translating the benefits of FinTech adoption into better performance. This study supports the literature by providing a practical example of the use of FinTech as a factor for competitiveness and improving the performance of banks in the Middle East. These findings have huge managerial and practical implications and can help large banks gain competitive advantage and effectively integrate FinTech platforms to achieve real improvements. The value of this research is that it fills the gap in the existing literature, i.e. the role of competition as a mediating factor. By combining studies on competitive strategy approaches with those on technological innovation theory, this study combines a complete worldview related to the performance of banks in the digital age.

1. Introduction

Financial services and banking institutions must embrace digital transformation and leverage internet-based technologies to cater to evolving stakeholder expectations and maintain a competitive edge. By utilising existing technologies, financial technology (FinTech) has transformed the banking sector in just two decades. It's like a revolution that requires more flexibility. Traditional institutions need to innovate regularly to keep up with a rapidly changing and digitalised environment (Durak, et al., 2024). FinTech has ushered in a new digital age in the banking sector, but the new age is not without its merits and shortcomings. On the one hand, FinTech has been very helpful in developing new products and services, simplifying processes and improving the customer experience. On the other hand, they have fuelled competition, reshaped traditional trading models and ensured that more capital must be spent on technology needs. Not only that, but some are concerned that FinTech solutions could encroach on network security, data protection and regulatory issues (Oyewole, et al., 2024). Financial institutions resisting FinTech face one or two difficulties that are varied and far-reaching. From a banking perspective, the most important issue may be unfair competition, the fact that financial technology companies can reach consumers directly and without intermediaries (Arner et al., 2016; Alkhawaldeh et al., 2024; Al-afeef et al., 2024). As a result, banks' market share and recaptured revenue streams have shrunk significantly. In addition, technology is evolving faster and faster, which means that the

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local system is not being modernised, requiring a great deal of effort for digital transformation (Deloitte, 2020). With the increasing reliability of digital substrates combined with the proliferation of data, cybersecurity risk has also skyrocketed. Financial institutions are another sector vulnerable to cyberattacks. According to the BCG report (2021), an average of 25 incidents causing either financial or reputational loss are identified per year. Compliance is no easy task. In recent years, authorities have imposed strict regulations to ensure that consumers' interests are protected and financial stability is maintained (KPMG, 2022). In addition, the emergence of FinTech has significantly increased competitive pressure in the financial services sector. This affects not only traditional financial institutions, but also tech giants and small fintech start-ups, which are new entrants to the financial services market. A document shows that 88% of traditional financial institutions believe that FinTech is capable of meeting their expectations and disrupting the operations of these companies in areas of the business domain that they favour. Therefore, banks need to invest in innovation and improve the digital capabilities of their organisations to stay ahead of the competition. However, given these challenges, there is little literature on the question of whether FinTech enhances or threatens bank performance, with competitiveness being the mediating factor. Many scholars have addressed the extent to which financial technology is disrupting the banking sector (Gomber et al., 2018; Vives, 2019). Nevertheless, there are few research articles analysing the relationship between FinTech adoption, competitiveness and bank performance, especially in the Middle East. This paper aims to discover the peace-making element in the link between FinTech adoption and banking performance in European countries, thus unravelling the hidden secrets that could encourage industry players, regulators and policy makers.

2. Literature Review and Theoretical Underpinnings

2.1 Background of Middle Eastern Countries

The major changes in financial services affecting the Middle East, driven by the integration of various financial technology (FinTech) solutions, are well known today. FinTech is emerging as the denominator of change, fighting with the outdated banking strategies and motivating the banking sector to be creative and innovative to maintain its competitiveness. The FinTech sector in the Middle East has seen tremendous growth due to factors such as the tech-savvy Popert, high smartphone penetration rate and government initiatives to encourage innovation and digital transformation. Countries such as the United Arab Emirates, Saudi Arabia and Bahrain are manifesting their status as regional FinTech hubs by attracting large investments in FinTech hubs and fostering a distinct and vibrant ecology of upstarts and established players. FinTech has already greatly impacted the various sectors of the financial industry – mobile banking, digital payments, P2Pp2p lending, crowdsourcing and various types of advisory services. The newly improved solutions not only offer customers more convenience, but also contribute to new revenue streams and cost reductions that improve the image and performance of banks (Alkhawaldeh et al., 2024). While the arrival of FinTechs has shown that traditional banks in the Middle East are on weak footing, it has also raised a host of issues that these banks have had to face. The entry of fast and slightly creative FinTech companies with agile business models and a customer-centric approach is now a trend and these companies are a threat to the familiar banking practices of people who follow a long tradition (Deloitte, 2020). Financial institutions need to drastically modernise their legacy systems, move towards a digital future and create an innovation-centric culture in order not to lose their competitiveness. In addition, the security of funds, data protection and regulatory compliance are top priorities following the rise of digital banking. As governments witness the result of FinTech, regulators of this field include a great diversity of activities towards preserving the interests of consumers and the stability of the financial sector, while recognizing the need to promote the development and give an enabling environment to the FinTech companies. The issues, thus, are emerging about the impact of Fintech adoption, and it is the source of the volume of academic studies which are exploring and debating about this issue. On the one hand, it has been revealed in some studies that FinTech is highly efficient in terms of cutting down the costs, improvement of operations and consumers' satisfaction (Alhawamdeh et al., 2024), on the other hand, there is a risk that FinTech might disrupt the financial sector and the need for adaptation plays a key role (McKinsey, 2021). As FinTech continues its pace of advancement and fosters competition in the financial sector of the Middle East, analyzing how technology adoption impacts banks performance by agency policy makers remains critical in arriving at competitive and informed policy decisions.

2.2 Banking Performance

Bank Performance is also a complex concept that encompasses a range of financial and non-financial indicators that point to the overall health or efficiency of a banking institution. Broadly speaking, the performance of banks can be assessed on the basis of three interrelated dimensions: Income, Financial Condition, Costs and Risks. Profitability indicators examine banks' abilities to manage profit and shareholder value over the long term. Furthermore, we will use indicators such as ROA, ROE, NIM and EPS as the key profitability indicators (Goddard et al., 2004; Athanasoglou et al., 2008). These ratios serve as key indicators for measuring a bank's ability to generate income from operations, the way it manages and deploys resources, and the return on assets relative to the assets and equity that the bank owns. Operational efficiency indicators assess a bank's potential to manage staff, materials, utilities and other business resources appropriately and to keep costs low. Indicators of this metric include cost-to-income ratio, loan loss ratio and non-performing loans (Sufian & Habibullah, 2009; Tan et al., 2024). Such metrics give the bank its productivity, evaluate the quality of its assets, risk management and thus the overall efficiency and long-term sustainability of operational progress. Risk management is equally important as a bank's performance based on the identification, assessment and mitigation of the multiple financial and non-financial risks that may lead to loss

or damage. The most important risk indicators in this context are capital ratios, liquidity ratios and the results of stress tests (Yogiana, & Shaleha, 2024; Ismaeel et al., 2023). These measures assess a bank's ability to withstand unfavourable economic conditions, manage liquidity risks and maintain a sufficient capital buffer against potential losses, thereby ensuring its long-term position and stability. In addition to traditional financial metrics such as profitability and asset utilisation, the assessment of bank performance is becoming increasingly complex, i.e. non-financial indicators such as customer satisfaction, brand reputation and environmental, social and governance (ESG) factors are adding to the complexity of assessing bank performance. Qualitative factors such as the quality of the bank's ability to build long-term customer relationships, strengthen its public image and commit to sustainable development goals would determine the long-term success of the financial institution. These factors are important to know as they would influence the bank's assets and leadership position. Taken together, the various performance indicators, apart from profitability, provide an overall picture of the bank's development. By combining the information on the bank's activities, stakeholders, regulators and policy makers can choose the appropriate approaches to strengthen the bank's performance and maintain the stability of the financial system in the country.

2.3 Fintech

Financial technologies (FinTech) is a dynamically growing area of study that comprises the creation of new, innovative technological products or their practical usage for the benefit of the financial industry and its functioning. From a FinTech perspective, financial management has turned upside down and changed banking models, which has been useful in fostering service provision. Which leads to a better market segmentation, competitive speeds, more latter access and customized services (Arner et al. 2016; Gomber et al. 2018). On a fundamental level, the recent technological advancements which are the mobile application, cloud computing, big data, artificial intelligence and blockchain among others enhance the ways in which financial services are provided and disbursed (Schueffel, 2016). These technologies have enabled the refinement of existing products and services as well as the creation of new products and services, including mobile banking, digital payments, peer-to-peer lending, crowdfunding, cryptocurrencies and robo-advisories, to name but a few (Lee & Shin, 2018; Naheem, 2019). FinTech innovations could significantly increase the possibility of closing the financial gap by offering banking services to the unserved, reducing operational costs and providing convenience to customers thanks to the smart and simple user interface. In addition, FinTech has improved business models and revenue streams, turning traditional financial institutions into dollar and cent challengers to mitigate competition within the industry (Vives, 2019). The rapid pace of FinTechs, on the other hand, has brought with it threats such as data privacy, cybersecurity risks and regulatory compliance, which has raised concerns at both individual and macroprudential levels (Arner et al., 2017; Buchak et al., 2018; Afeef et al., 2024). FinTech firms handle data and transactions of a sensitive nature, so security systems need to be robust and professional regulation is required to protect the interests of customers and the stability of the financial system. Moreover, after FinTech became an integral part of the banking industry, the institutions devoted time and effort to digitalization and technological infrastructure, which is one of the most critical aspects of the economic digitization process (Deloitte, 2020). Therefore, this propels the dismantling of the barriers between banks and FinTech companies, with the partners entering into a consensus, collusion and accommodation, and each side taking advantage of the weaknesses of the other while maintaining a competitive edge. As FinTech has grown to mushroom and become an indication of business transformation in the financial sector, the effects on the aspects of banking efficiency, profitability such as operational efficiency and risk management have become a battleground amongst academics and the financial services industry (Heines, 2023).

2.4 Competitiveness

In business, competitiveness is a multi-layered concept that includes the ability of a company to compete successfully in its industry or to gain and maintain the largest market share. The banking sector, which is an important source of loans and deposits in many countries, is highly competitive. Competitiveness is made up of several factors that play an important role in the long-term success and outperformance of banks over their competitors (Shaffer, 1998; Heffernan, 2005). Effective banking operations are characterised by the efficient use of resources, the implementation of practical cost management and the adoption of technology to refine processes and increase productivity (Sufian & Habibullah, 2009; Tans & Floros 2012). Banks that operate efficiently have the advantage of being able to offer competitive prices to their customers, provide them with a better customer experience and generate higher profits. In addition to product and service innovation, the competing factor is product quality. In the ever-changing financial services sector, banks must continuously introduce a variety of products and services to meet changing customer needs and stay ahead of the competition (Lerner & Tufano, 2011; Akhisar et al., 2015; Al-Afeef et al., 2023). Innovation can range from the invention of new financial instruments and the use of FinTech trends to the development of personalised products tailored to specific target groups. Banks' risk management capabilities are secondary in terms of their competitiveness. Flexible risk management strategies, strong governance structures, efficient capital management systems and sound liquidity practises enable banks to not only survive but even gain an advantage in turbulent times, maintain financial stability and strengthen stakeholder confidence in banks (Basel Committee on Banking Supervision, 2010; Demirgüç-Kunt & Huizinga, 1999). In addition, the competitiveness of banks is also influenced by external conditions, i.e. the regulatory environment, market structures and macroeconomic conditions (Bikker & Haaf, 2002; Claessens & Laeven, 2004). Favourable regulatory conditions that promote innovation and fair competition and the existence of strong macroeconomic fundamentals improve a bank's performance and thus its competitiveness by creating a good business environment.

2.5 The Theoretical Underpinnings

The theoretical underpinnings of the relationship between FinTech adoption and banking sector performance can be found in most theoretical frameworks and theories. The resource-based view (RBV) theory is one of such powerful theories that underpins the basis for explaining how such dynamics exists in the developed market. This was the first theory as put forward by the scholars of Broadway in the year, 1991 & Penrose, in the year 1959. The RBV theory posits that those are valuable competencies that of a certain company make it possible for it to stand out from (and be the best in) the flow of the competitive markets (Barney, 1991). FinTech in Banking, FinTech solutions are technologies-based tools which contribute to operate all the processes in the banking sector in a more efficient manner and thereby add a new dimension of competition. On one side, Eisenhardt and Martin (2000) also propose based on dynamic capabilities theory (DCT) that management capabilities as well as resources are responsible for the successful reconfiguration and adaptation of the company's capabilities and resources. This regulation is of a great importance in the FinTech area, when banks must implement and update equity maintaining their own competitiveness stoically, which is possible only under the condition of successfully solving the obstacles of the technical disruption hydra-headed emerging customer desires. Other literature also reveals the Technology Acceptance Model (TAM) (Davis, 1989; Venkatesh & Davis, 2000) provides another relevant theoretical framework that helps explain the core beliefs that surround acceptance of new technologies, influencing the acceptance process. The model may find the shifting variables and give explanations to why banks, characterized by low-time and higher adoption-rate of FinTech, underperform and lose their competitiveness in the future. Additionally, the proposed innovation diffusion theory (Rogers, 2003; Alkhawaldeh et al., 2023) which is composed of data allowing to draw the process through which the FinTech innovations are adopted and diffused in the banking sector could be a good explanation. According to this theory, the components that are on the forefront include factors such as relative superiority, ease of use, complexity, and desire to participate in the trials which all affect the process of FinTech adoption. Finally, the boss methodology which was built on industrial organization theory (Bain, 1951; Mason, 1949) is also important. It states that the market structure determines the strategy of a certain company and it follows from this one whether the performance is good or not. This method can be utilized to determine that the enhancement of FinTech possibilities and competition in the banking industry either causes a shift or broader changes in the market dynamics.

3. Previous Studies and Hypothesis Development

3.1 Fintech and Banking performance

The role of FinTech endorsement on banking performance has been explored through various empirical studies. With the magnetic attractiveness of FinTech lenders, research by Buchak et al. (2018) revealed that profitability of traditional banks went down, hitting the areas of higher FinTech lending most. Banks have the potential to win from FinTech firms partnership agreement, not only to become more operationally efficient but also to be more profitable. The contribution of FinTechs to process efficiency has also been examined. The role for FinTech upstream valuation service providers in streamlining processes, reducing cost and enhancing customer experience was demonstrated by Wonglimpiyarat (2017), this would in turn improve operational performances. The second aspect concerns correspondence between Gomber and associates and the fact that banking institutions can use the FinTech solutions to optimize on resource allocation and enhance their cost-to-income ratios in this direction. While studies have focused on not only the gains, but also the set of problems facing FinTech, risk management has been a topic of particular interest. Arner et al. (2017) have stressed the process of introducing and implementing strong cybersecurity measures and regulatory frameworks to help in the prevention of Fintech adoption risk factors, which include data breaches and financial risks. Contrarily, a suggestion seeped by Philippon (2016) was in the line that FinTech could lead to a refinement of risk management practices through the applicability of machine learning technologies, thus, empowering the risk assessment. Based on these previous studies, the following hypotheses was developed:

H_1: *FinTech adoption has a significant positive impact on banking performance.*

3.2 Fintech and Competitiveness

Various researchers have found that FinTech enables banks to offer better products, improve operational processes and also offer additional services (Lerner & Tufano, 2011; Akhisar et al., 2015; Vives, 2019). Gomber et al. (2018) suggested that fintech technologies can boost competition by breaking down the barriers to entry that open up the financial services market to new players who might not otherwise have been able to enter it, thus undermining the dominance of traditional banks. Meanwhile, others have argued that the respective banks could support fintech companies, leading to an intensification of competition and a potential disruption of the traditional business model (Philippon, 2016; Navaretti et al., 2018). They have found that as FinTech lenders enter the market, the market shares of traditional banks decline more significantly in regions that they found to be quite active in FinTech lending. In addition, studies have investigated whether the facilitating effect of competitiveness is the reason why Fintechs have improved banks' performance. FinTech implementation can also serve as a proxy for performance improvement through lean processes, cost reduction and high-quality customer experience, which in turn promotes bank competitiveness and performance health (Tan, et al., 2024). Based on this previous research, this study again hypothesised that:

H_2: *FinTech adoption has a significant positive impact on competitiveness.*

2.3 Competitiveness and Banking performance

In addition to the academic studies that have focused on various bank performance parameters such as profitability, efficiency and risk behaviour (Bikker & Haaf, 2002; Claessens & Laeven, 2004; Fu et al., 2014), efficiency and innovation are the two arguments cited by researchers. These studies come to mixed conclusions, suggesting that competition undermines market power and that price pressure may lead to lower profitability. In contrast, there are other studies that argue that competition promotes efficiency and innovativeness and therefore performance. In the banking sector in general, Tan and Floros (2012) confirm the existence of a positive relationship between competition and cost efficiency of Chinese banks, which means that banks face the pressure of competition and try to optimise their operations and reduce costs. In addition, Sufian and Habibullah (2009) pointed out that higher competition is on average associated with higher efficiency of banking operations and better profits of the Thai banking system. However, studies have also shown that this could lead to risk-taking behaviour as there is likely to be a trade-off between the degree of competition and entrepreneurship (Kant, et al., 2024). Beck et al. concluded that banks, in their pursuit of higher returns, may use increased competition as a reason for increased risk-taking behaviour, thus endangering the financial system. However, others argue that increased competition motivates banks to play real games, i.e. games in which risk is shared, thus reducing the risk taken by each individual bank. These studies serve as the basis for the development of the following hypothesis.:

H_3: *Competitiveness has a positive impact on banking performance.*

2.4 Competitiveness

Many authors have tried to explore competitiveness, which can either be a driving force or stand between two goals: Innovation and company performance. Atalay et al. (2013) found evidence in the Turkish automotive industry that competitiveness partially mediates between innovation and financial performance. Others also suggested that competitiveness mediates between the development and profitability of the manufacturing sector in the UK. In terms of banking, Tan and Floros (2012) argued that competition is a driving force in calibrating the relationship between risk appetite and bank performance. Their research suggests that higher risk-taking might play a positive role in times of high competition, when banks need to generate more revenue to position themselves at the top and with high returns. In addition, Sufian and Habibullah (2009) analysed the mediating position of competitiveness in the relationship between bank-specific aspects such as capitalisation and liquidity with credit risk and profitability in the Thai banking sector. This study found that competitiveness plays a certain role in relationships. Thus, bank-specific characteristics were found to be a potential mechanism through which lenders determine performance. Based on these previous studies and the theoretical foundations, i.e. the resource-based view (RBV) and dynamic capabilities theory, which we are familiar with from previous research, we formulated the following hypotheses:

H_4: *Competitiveness mediates the relationship between FinTech adoption and banking performance.*

3. Research Methodology

This study employs a quantitative research design, utilizing a survey-based approach to gather data from banking professionals in the Middle Eastern region. The present correlational study uses a cross-sectional research design to analyse the relationships between the currently existing variables. The target population includes 25,000 employees working in various positions such as executives, managers, operational staff, accounting professionals and other related issues in the banking industry. In order to obtain a representative sample and increase the validity of the conclusions, several sampling methods are used. The first stage of the research involves selecting a certain percentage of banks in each Middle Eastern country using a well-adjusted random sample weighted by bank size or market share. The next step is to use the random sample to select individuals from the banks we selected. The minimum sample size recommended by Kock and Hadaya (2018) for PLS-SEM analyses with a statistical power of 80% and a maximum number of paths (arrows) - equal to five - leading to a construct in the model is 379 respondents. A higher number is therefore aimed for in order to take account of possible non-response. The research instruments include a structured questionnaire to measure the main variables of interest: FinTech acquisition, bank competitiveness and bank performance. For each construct, we adapt and revise the items from the study published by Dwivedi and colleagues (2021) and modify them to be suitable for the banking sector of the Middle East region. The FinTech adoption (FA), Competitiveness (C), and Banking performance (BF). Data was collected through online and offline methods both which improved the response rate as well as enabled respondents' network to be widened. We devoted an online questionnaire forum based on some templates and sent them to potential respondents of the target banks. In our bid to promote variety, we also distribute the questionnaire both online and offline for the convenience of people who desire them or just want their own copy. All is done to ensure that the informed consent is obtained from each participant, and the confidentiality of their information strictly maintained out there when that data will be collected and analyzed. The last stage demands then the inclusion of the partial least square's structural equation modelling (SEM-PLS) technique for conducting the derived data analysis, an efficient tool which is preferred for handling models that consist of multiple elements and relations with multiple formative and reflective measurement models (Hair et al., 2017; Sarstedt et al., 2017). The study involves several steps of analysis, namely: the

measurement model evaluation along with assessing its reliability and validity, the assessment of the structural model testing of the postulated relations between the two independent variables, and the probe into competitiveness as a mediating relationship either intra-organisational competition via relevant techniques.

4. Results and Discussion

Table 1 shows the results of the measurement model evaluation for the constructs used in the study: Primarily, bank performance, competitiveness and fintech adoption. Table 1 contains coefficients that describe the reliability and validity of the outlined variables. The Cronbach's alpha values for all constructs were above the recommended threshold of 0.7 (Nunnally, 1978), which means that good internal consistency reliability was achieved. The composite reliability values for rho is 0.7 which are above the recommended threshold (Hair et al., 2011), which further emphasises the reliability of the constructs. The results of the AVE conducted for Banking Performance (%), Competitiveness (%) and Fintech Adoption (%) of the data set exceed the recommended value of 0.5 (Hair et al., 2011) and thus prove that the constructs of the study have an acceptable convergent validity. In the eyes of the observer, the items that make up a certain construct should be strongly correlated with each other so that they can be interpreted as expressions of the same primary parameter. All VIF values are below the threshold value of 5 and thus the multicollinearity in the measurement model is not very pronounced (Hair et al., 2011).

Table 1
Measurement Model

	Factor Loading	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	VIF
Banking Performance		**0.884**	**0.889**	**0.916**	**0.686**	
BF1	0.762					1.802
BF2	0.883					2.131
BF3	0.875					2.998
BF4	0.823					2.201
BF5	0.790					1.897
Competitiveness		**0.896**	**0.902**	**0.924**	**0.708**	
C1	0.836					2.242
C2	0.881					2.668
C3	0.887					2.995
C4	0.830					2.338
C5	0.768					1.769
Fintech Adoption		**0.922**	**0.928**	**0.937**	**0.649**	
FA1	0.753					1.921
FA2	0.795					2.256
FA3	0.846					2.825
FA4	0.862					2.406
FA5	0.856					2.296
FA6	0.767					2.081
FA7	0.813					2.34
FA8	0.745					1.922

Table 2 shows the results of the HTMT assessment (Heterotrait-Monotrait ratio), which is an option for confirming the discriminant validity of the measurement model. Discriminant validity is about separating the measures for one construct from another, as it is statistically unlikely to find a strong relationship between different constructs if they are different (Henseler et al., 2015). The HTMT ratings provide information about the degree of association between the dimensions. Consistent with the threshold value of 0.85 (Henseler et al., 2015), the values in Table 2 indicate that there is adequate discriminant validity between the constructs (Banking Performance, Competitiveness and Fintech Adoption) as recommended. It should be noted that the sub-indices are 0.751 between Banking Performance and Competitiveness, 0.677 between Banking Performance and Fintech Adoption and 0.619 between Competitiveness and Fintech Adoption. These values show that the constructs have uniqueness and measure the different characteristics of the latent variables, which is very important to achieve the conceptual validity of the measurement model.

Table 2
Heterotrait-Monotrait Ratio Discriminant Validity

	Banking Performance	Competitiveness	Fintech Adoption
Banking Performance			
Competitiveness	0.751		
Fintech Adoption	0.677	0.619	

Table 3 below shows the results of the Fornell-Larcker criterion, another technique for assessing the discriminant validity of the model. Discriminant validity of the constructs in the model ensures that each construct (or variable in the model) is distinct, i.e., the constructs are perceived as distinct and measure their different concepts (Fornell & Larcker, 1981). The square root of the average variance extracted (AVE) of each construct in the model is compared to each specific correlation between them

using the Fornell-Larcker criterion. Discriminant validity can be checked by confirming that the square root of each AVE is greater than the correlations between that construct and any other. In Table 3, the values on the diagonal (in bold) represent the square root of the AVE for each construct: Banking Performance shows 0.828, Competitiveness follows with 0.841 and Fintech Adoption with 0.806. These values tend to be more significant than the other values off the diagonal indicating the correlation between the tasks. As shown in Table 3, this means that the Fornell-Larcker criterion is met, which means that the discriminant validity between the factors considered in the measurement model is given.

Table 3
Fornell-Larcker Criterion Discriminant Validity

	Banking Performance	Competitiveness	Fintech Adoption
Banking Performance	**0.828**		
Competitiveness	0.765	**0.841**	
Fintech Adoption	0.616	0.572	**0.806**

5. Hypothesis Testing

Table 4 presents the results of the analysis examining the effect of FinTech adoption on competitiveness and banking performance, as well as the effect of competitiveness on banking performance. The findings justify the insight that FinTech adoption has a positive and statistically significant impact on banking performance in which it holds a beta coefficient of 0.266 (t-statistic = 8.673, p-value < 0.05). This substantiates the hypothesis that implementing FinTech may help improve bank performance due to considerations of efficiency, customers' demands as well as product offerings (Dwivedi et al., 2021). It also concludes that this relationship value, which shows a strong positive significance between FinTech adoption and competitiveness with a beta value of 0.572 (t-statistic = 20.697, p-value < 0.05), indicates a high level of competition created by FinTech adoption. Thus, the FinTech concept offers bank branches the opportunity to compete with their rivals by offering services that are different, cost-efficient and potentially market winning. (For example: Hair et al., 2017; Sarstedt et al., 2017.) Furthermore, the results emphasise the fact that one of the most influential factors that positively and significantly affect bank performance is their competitiveness with a beta coefficient of 0.631 (t-statistic = 23.63, p-value < 0.05). The result of this finding emphasises the importance of remaining competitive in the banking sector as this leads to a balanced overall performance. Banks that can leverage their competences, including using FinTech and other forms of technological innovation, are likely to ultimately compete better with traditional banks (Kock & Hadaya, 2018).

Table 4
Effect of Fintech on Competitiveness and Banking performance

	Beta Values	Standard deviation	T statistics	P values
Fintech Adoption -> Banking Performance	0.266	0.031	8.673	0.000
Fintech Adoption -> Competitiveness	0.572	0.028	20.697	0.000
Competitiveness -> Banking Performance	0.613	0.027	23.095	0.000

As seen in Table 5, an analysis of mediation effects demonstrates that competitiveness serves as a mediating variable that acts between the FinTech adoption and banking performance. The result demonstrates a powerful direct relation between the beta value at 0.35 (t-statistic 17.535, p-value less than 0.05). Thus, this indicates that the working model of competitiveness is a mediator, where it partially accounts for banking performance improvement after FinTech acceptance. It is thus noticeable that technology use within the finance sector not only affects the quality of financial institutions directly by its adoption but also promotes processes involving competition (Hair et al., 2017; Sarstedt et al., 2017). As a result, it can be assumed that the banks that successfully FinTech to take advantage of are more likely to be the ones who are subject to greater performance enhancements. (Kock & Hadaya, 2018).

Table 5
Mediating Role of Competitiveness on FinTech adoption and banking performance

	Beta Values	Standard deviation	T statistics	P values
Fintech Adoption→ Competitiveness → Banking Performance	0.35	0.02	17.535	0.000

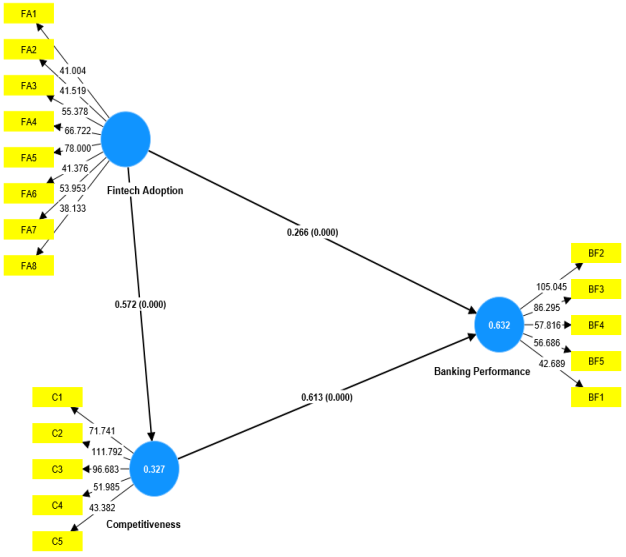

Fig. 2. Graphical Results

6. Discussion

The results prove to be very important for understanding the complex relationships between FinTech adoption, competitiveness and bank profits in the Middle East region. Firstly, the result of this research seems to show an encouraging and statistically significant positive impact of FinTech usage on the banking industry. The fact that this area is not traditionally considered very innovative is increasingly becoming an asset for banks and governments despite the emergence of the financial technology sector, as shown in the paper on FinTech (Dwivedi et al., 2021). By using cutting-edge digital technologies in their business processes, banks could automate their procedures, customers could make better use of banking services and expand their business opportunities, and even make more profits, which really improves their performance metrics. The correlation indicator reflects a high and statistically significant positive relationship, i.e. the competitiveness of a country and the spread of FinTech go hand in hand. This is the reason why Fintech serves as an exciting factor among competitors as banks rely on technology to manage this development and execution of strategies and processes (Hair et al., 2017). As the dynamics of the financial sector become more volatile in the wake of dynamic change, banks that offer FinTech solutions to their customers have a competitive advantage over rival commercial banks. The practical function of this technology to reduce costs, accelerate innovation and deliver personalised services would make the use of technology a competitive advantage. Furthermore, the study shows that mindset and competitiveness also play a major role in the banking sector. The hypothesis fits perfectly into the theory of competitive strategy as well as the dynamics of the banking sector and defines the role of competitiveness in increasing the performance of the banking sector as positive and significant (Kock & Hadaya, 2018). Banks that can employ various strategies, such as the use of FinTech, to stay ahead of their competitors in capturing market share, retaining customers and achieving higher profitability are likely to achieve better financial performance. Please note that our findings come from a rigorous quantitative survey conducted in various Middle Eastern countries, considering the generalisability and applicability of marine pollution abatement. The methodology of this research includes different types and sizes of samples and data collection strategies that include verification within the regional frame of reference. While the findings facilitate the understanding of the general socio-economic and regulatory structure of the banking sector in the Middle East, it is very important to apply these findings in this broader context. Cultural specificities, binding governmental frameworks and market laws can shape the use and influence of technological solutions, thus actualising this very fact. Furthermore, it is important to realise that the FinTech ecosystem is a constantly changing and competitive field in which innovation must be carried out. The rapid introduction of newer technologies and changing consumer tastes are forcing banks not to become rigid. They should therefore remain dynamic and constantly evaluate their FinTech strategies in order to have a competitive advantage in the market and sustainably improve their performance (Dwivedi et al., 2021).

A clear indirect effect emerges from the analysis, reflecting the partial mediation of the positive impact of FinTech adoption on the performance of banks in the Middle East region. However, such an insightful result has huge implications for the bank system and decision-making processes. It is suggested that while the adoption of FinTech leads to an improvement in the effectiveness of microfinance management through operational efficiency, cost optimisation and increase in customer satisfaction, the impact of FinTech is highly effective in increasing the competitiveness of the industry. The banks which can identify the specific FinTech solutions to differentiate their offerings and utilise FinTech solutions to gain market share and competitive advantage are likely to experience greater performance improvements than those that only adopt FinTech without

a clear competitive strategy (Sarstedt et al., 2017). Furthermore, the mediating impact of competitive advantage, moreover, is an example of what needs to be built having an integrated approach to a banking environment, not only updating informational systems into the latest technologies, but also aligning strategies, methods and organisational culture into appropriate proper style. This research would be the key to be done in the Middle East in different countries. Accordingly, one can conclude that the relationship between the RPCs and the GDP has a high mediation impact in the international context, because the data is collected in different countries. While it cannot be ignored that the degree and defines of competition and bank FinTech adoption's interaction might differ from one country to another, this depends on the legal, market, and cultural conditions (Dwivedi et al., 2021).

7. Conclusion

The fundamental purpose of this research was to investigate the mediating effect of competitiveness on the relationship between FinTech adoption and banking performance in general and in the Middle East region. It is noticeable that FinTech and the banks that battle each other largely have altered the ground rules in the banking market as banks struggle to remain competitive in this area. Therefore, it is important to execute this research to bring banks the data they need to help them target effectively in this space. Eventually financial and economic experts from all Middle East Countries draw up a full and trustworthy conclusion through extensive quantitative analysis. As a result, a series of important findings have been revealed. Actually, the research outcomes of the Bank Sector Efficiency Study indicated the contribution to the betterment of the bank efficiency as is known by other studies and the banks improved their market performance. Moreover, the results also observed a noticeable positive relationship between FinTech services and competitiveness in the country, and the assumption that FinTech services could serve as a strong weapon for banks in the vicinity in the fight to the last man (Hair et al., 2017). Surprisingly, what got unearthed was that in the context of FinTech introduction there was considered to be a kind of mediating mechanism between FinTech and bank performance and it was found that of competitiveness. A very considerable chunk of the cash earned from banks' implementations of FinTech flows to non-bank performance but manages to be moved back from competitiveness if it is translatable. The banks who creatively use FinTech solutions (instead of just putting them into operation) to achieve their strategic goals are in a better position than the banks which do not adopt a strategic vision and just stick with the technology (Sarstedt et al., 2017). This study clearly shows the progress of the banking industry through the introduction of FinTehc in the Middle East. By adopting novel digital technologies, financial institutions can both increase their operational efficiency and provide a better experience to their customers while maintaining their competitive edge in the market. Although the impact of FinTech on bank performance is best realised when coupled with a plan to drive competitive advantage through product diversification, cost optimisation and clearly defined market positioning, it is also an effective weapon for enhancing bank performance. The findings are not only crucial for deepening knowledge on the links between FinTech, banking performance and competitiveness, but also open avenues for industry experts and policy makers to mitigate the impact of FinTech in their respective financial systems. Financial institutions in this region should focus their efforts on developing comprehensive FinTech plans which consider financial capabilities and strategic approaches to achieve the greatest benefits and successful outcomes in the long run.

8. Implications of the Study

The findings of this study have significant managerial implications for banking institutions operating in the Middle Eastern region. The serendipitous relationship between the use of FinTech and banks' performance suggests that you should keep in mind the importance of accelerating transition processes and introducing innovative technologies into your operations. Bank CEOs and heads of decision-making departments need to focus on investment because FinTech solutions make banking operations effective, take the customer experience to the highest level and open up new revenue channels. On the other hand, if it is determined that competitiveness is the factor driving the precision of technological gains, the introduction of FinTech alone will not yield the greatest benefits. Managers are responsible for discovering and utilizing Fin Technologies in a way that creates an impenetrable advantage that sets them apart from their competitors. The study offers smart recommendations for participants trying to see through the thick fog of uncertainty and do business in the dynamic competitive climate of the Middle East. By understanding the interactions between the level of FinTech adoption, competitiveness and banking systems performance, financial institutions can properly set their goals in terms of resource utilization and operational strategies. Banks should go a step further in developing fintech solutions that aim to provide better services to customers while minimizing costs. Furthermore, shaping an organizational culture based on innovation, agility and customer centricity is an important must achieve the company's goals and consolidate FinTech investments as sources of competitive advantage and improvement. Within the current state of knowledge, this study makes a valuable contribution by clarifying the mediating role of FinTech as a vehicle for the relationship between FinTech adoption and banking performance. Previously, most research has focused on the direct impact of FinTech on business, but this study provides empirical evidence that competitiveness is one of the most important factors that allow the benefits of FinTech adoption to be amplified. This finding shows that there is a need to combine things like strategic perspectives on competition and innovation theory on technologies in banking. This emphasizes another feature of this study, which is the contextual interpretation of such relationships within the Middle East region.

9. Limitations of the Study and Future Recommendations

While this study provides valuable insights into the mediating role of competitiveness in the relationship between FinTech adoption and banking performance in the Middle Eastern region, it is important to acknowledge certain limitations. The focus of the horizontal research design is on the snapshot which captures data at a specific point in time rather than covering an entire period of time. In addition to this general drawback, data is collected at a specific point in time, which may not cover the actual period of change. In addition to cross-sectional studies, which would provide a more comprehensive understanding of how these relationships change as the sector and its dynamics change over time, longitudinal research could provide a clearer understanding of the relationships. Furthermore, the study relies on self-assessed data, which may be subject to the biases and perceptual differences of banking professionals. Future research should incorporate subject-based performance measures and integrate data from multiple sources to more closely correlate results. Next, explore the implications of this research by looking for different options for future exploration. In addition, we should explore the modifying elements that act as lenses through which the impact of FinTech on bank competition and performance appears. For example, organisational culture, regulatory environment or market conditions could reverse the overall picture of FinTech to provide more clarity. In addition, one of the future studies could expand the radius of the study to include more Middle East countries, as diversity within the region is generally limited. This could also help to assess cross-cultural differences and explore the applicability of the results in different geographical and economic settings. Finally, such comparisons could be of great value in demonstrating the importance of cultural and institutional factors in the emergence of FinTech influence on the banking sector in terms of competitiveness and performance. Additionally, qualitative research approaches, such as case studies or in-depth interviews with industry experts and decision-makers, could complement the quantitative findings and offer deeper insights into the strategic considerations, challenges, and best practices related to leveraging FinTech for competitive advantages and improved banking performance. Finally, in the context of a rapidly evolving FinTech industry, a longitudinal study that monitors the development and adoption of novel technologies could offer us a dynamic view of the variables presented in this section and, by extension, theory and practise in the field.

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