Digitalisation and AI adoption as drivers of market share in GCC banking

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ABSTRACT

This study investigates the impact of digitalization and AI adoption on the market share of banks operating in the Gulf Cooperation Council's (GCC) region, drawing upon the resource-based view (RBV) and dynamic capabilities theory (DCT). In the current context of digital transformation and AI-driven innovation reshaping the banking sector, it is crucial to understand the role of these technologies in driving competitive advantage. The study constructs novel composite indices for digitalization and AI adoption using secondary data from 400 bank-year observations across five GCC countries between 2015-2024. Employing a dynamic panel estimation technique, the analysis reveals that both digitalization and AI adoption significantly and positively influence bank market share, even after controlling for profitability, bank size, and macroeconomic conditions. These results hold strong across different models, supporting the idea that improving and adapting technological skills is key to enhancing the market share of banks. The study offers theoretical contributions by operationalizing digital and AI capabilities as strategic resources and practical implications for bank executives and policymakers aiming to strengthen digitalization in the financial sector. It also provides one of the first empirical validations of the digitalization–market share nexus in the GCC context, thereby filling an important gap in the literature on technology-enabled market performance.

Contribution/ Originality: This study contributed to the literature by developing and examining the impact of digitalization and AI adoption indices. The study also contributed to the literature by examining the market share of banks in the GCC. Theoretically, the study combined RBV and DCT to explain the variation in market share.

1. INTRODUCTION

The global banking industry is undergoing a profound transformation as digitalization and artificial intelligence (AI) increasingly reshape the structure, strategy, and service delivery mechanisms of financial institutions [1]. In emerging markets, digital technologies are no longer just tools for efficiency but strategic necessities for gaining a competitive edge [2]. Saudi Arabia, the UAE, Kuwait, Qatar, Oman, and Bahrain are projecting themselves as leaders in digital finance and banking innovation. These countries' ambitious national strategies, such as Saudi Vision 2030, Qatar Vision 2030, and the UAE Digital Economy Strategy 2031, emphasize the digital transformation of financial services for economic diversification and resilience [3]. In this evolving landscape, market share is a vital indicator of bank performance and strategic direction. It reflects how effectively a bank can expand its client base, innovate, and maintain relevance in a competitive, technology-driven world [4].

Several studies have assessed how digitalization influences bank profitability [5, 6], operational efficiency [7, 8], and customer satisfaction [9, 10], but few have explored how digitalization and AI adoption affect market share, particularly in GCC countries. Nevertheless, the effect of digitalization and AI adoption on organizational outcomes is varied. Some researchers have found that using technological tools and AI adoption has a negative effect on overall performance because it consumes the resources of banks and requires additional investment [11, 12]. On the other hand, other researchers indicated that the negative effect is only for the year of the initial investment, but the long-term effect is positive [5-8].

The focus of this study is on the market share of banks in the GCC. Market share is a forward-looking, externally evaluated indicator that better captures a bank's competitive advantage, especially in rapidly evolving sectors driven by transformative technology. Different from previous studies, this study focuses on digitalization and AI adoption and their impact on the market share of banks in the GCC. There are compelling theoretical and practical justifications for focusing on digitalization and AI adoption as the primary explanatory variables. From the perspective of the Resource-Based View (RBV), banks that invest in advanced technological capabilities such as digital platforms and AI systems acquire valuable, rare, and hard-to-imitate resources that can yield sustainable competitive advantages [13]. Along with the RBV, the Dynamic Capabilities Theory (DCT) emphasizes that banks in unpredictable and digitally disrupted markets must integrate and restructure resources to adapt to new possibilities and threats [14]. In the GCC, where consumer expectations, fintech innovation, and digital regulations are changing rapidly, market leadership and customer loyalty depend on adopting and utilizing these technologies.

Despite the strategic importance of digitization and AI in banking, empirical evidence in the GCC remains limited. Most studies rely on survey data to examine consumer opinions or the effects of digital transformation on financial results without considering market share dynamics [15, 16]. This macro-micro integrated perspective on digital competitiveness utilizes empirical data from GCC countries (excluding Bahrain) and focuses on market share as the key performance measure to fill these gaps. The literature illuminates how digitization and AI have transformed banking. Digital transformation improves operational efficiency, cost savings, service innovation, and customer satisfaction [17]. AI adoption improves decision-making, predictive analytics, and consumer customization [18, 19]. However, numerous key literature limitations hamper a thorough understanding of how these technologies impact competitive outcomes, such as market share, especially in emerging nations. First, most empirical research in this field has concentrated on developed economies in North America, Western Europe, and East Asia [20-22]. While useful, these studies may not completely capture the institutional, regulatory, and infrastructural differences of rising economies like the GCC. The GCC's economic structure, legal frameworks, and technological development need region-specific research.

Second, most research has focused on profitability metrics like return on assets (ROA) and return on equity (ROE) or operational indicators like cost-to-income ratios. These variables are significant but only partially reflect corporate competitiveness. Market share, however, is a more complete and externally evaluated measure of a firm's ability to attract and retain consumers in a competitive environment. Market share is understudied as a dependent variable in digital and AI adoption research, especially in banking, despite its strategic relevance. Third, measuring digitalization and AI adoption is flawed. Most technology adoption studies employ proxy variables or binary indicators, missing the degree and depth of adoption. Few studies have produced composite indices that capture the complex character of firm-level digital and AI capabilities, reducing accuracy and interpretability [23]. Finally, past research typically neglects methodological rigor when addressing endogeneity, autocorrelation, and unobserved heterogeneity. Cross-sectional or static panel models may distort estimates due to omitted variable bias or simultaneity in several studies [24]. These limitations reduce generalizability and policy relevance, especially in dynamic, fast-changing ecosystems like the GCC banking industry.

This study addresses these research gaps in four ways. First, it uses secondary data from GCC banks to create firm-level digitalization and AI adoption indexes, omitting Bahrain owing to data restrictions. These indices quantify

technical capabilities more precisely, but are unscalable. Second, the study employs dynamic panel data estimation with the GMM to reduce endogeneity and serial correlation, thereby enhancing causal inference. Third, the research analyzes market share, a performance indicator that directly reflects competitive results. Finally, regional policymakers, banking practitioners, and global digital transformation scholars may apply the findings to the GCC region's specific institutional, regulatory, and technical environment. The study addresses these theoretical, empirical, and methodological shortcomings to better understand how digital and AI capabilities influence the increasing competitiveness of the financial sector. It also supports future research on the strategic relevance of technology adoption in the modernization of financial institutions within structurally complex regulatory environments. The RBV and DCT underpin this study, providing a solid foundation for understanding how banks can leverage technology, specifically digitalization and AI, to increase market share in dynamic and competitive environments like the GCC.

Therefore, this study is motivated by the need to empirically analyze how the digitalization adoption index and the AI adoption index impact the market share of GCC banks using longitudinal data. Notably, it employs secondary data covering all GCC countries except Bahrain, due to data availability. This regional scope ensures analysis includes the largest and most economically influential members of the GCC, providing a reliable and generalizable understanding of trends in bank market performance in the digital era. The dataset comprises 400 bank-year observations from 40 banks over ten years (2015-2024), reflecting technological investment trends and associated market dynamics. The study controls for Return on Assets (ROA), market-to-book ratio (MB), loan-to-deposit ratio (LDR), bank size, GDP, and inflation to ensure robustness. These firm-level financial health and macroeconomic variables may affect digitalization, AI adoption, and market share. By employing them as control variables, the research isolates technology-driven capabilities' direct influence on market outcomes.

2. LITERATURE REVIEW

2.1. Theoretical Framework

This study utilizes RBV and DCT to show how digitalization and AI adoption boost GCC banks' market share. Technology disruption requires companies to hold considerable resources and flexibly reorganize these resources to respond to fast-changing conditions. The RBV states that companies acquire sustained competitive advantage by accessing and employing organizational resources and capabilities [13]. Modern banks consider AI and digital technologies important assets. These technologies allow banks to automate procedures, tailor client interactions, examine data in real time, and introduce new financial products and services [25]. These technologies can help a bank sustain and grow its market when integrated into its strategy. The RBV asserts that a firm's ability to obtain and employ resources effectively offers it a competitive edge [13]. AI and digitization help banks innovate, simplify banking processes, and engage consumers. The benefits of technology in terms of efficiency, agility, and customer satisfaction improve competitiveness and market share.

DCT was developed by Teece et al. [26]. The theory suggests that firms need to recognize, seize, and convert opportunities and risks. Banks must incorporate digital technology and AI into business models, customer strategies, and organizational processes to grow market share [27]. Digital and AI adoption demands resources, agility, and strategic and operational integration. Therefore, banks need to be dynamic and deploy dynamic capabilities to compete and gain market share in a rapidly growing digital infrastructure [27]. Saudi Vision 2030 and UAE AI Strategy 2031 have accelerated the digital transformation and competitiveness of financial services in the GCC, making dynamic capabilities essential [28]. Thus, combining RBV and DCT provides a robust conceptual framework to analyze how digitalization and AI adoption affect the market share of banks in the GCC.

2.2. Conceptual Framework

Figure 1 displays the conceptual framework, which includes the direct effect of digitalization and AI adoption on market share. The figure also includes the control variables. It illustrates how strategic resources, adaptive abilities, and performance results interact in digitally developing GCC banking. This study proposes that AI and digitalization adoption indices will positively affect market share. The study controls for internal factors and macroeconomic factors.
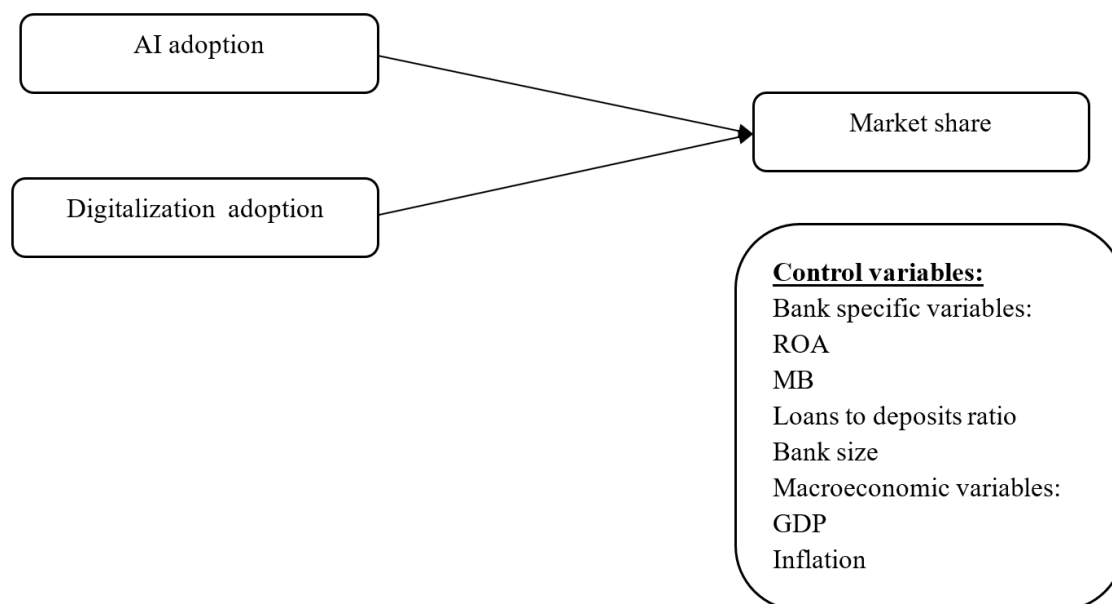

Figure 1. Conceptual framework.

2.3. Digitalization and Market Share

Digitalization in banking uses digital technology to improve customer experiences, operational efficiency, and financial services [17]. Mobile banking, internet banking, real-time analytics, and blockchain are digital adoptions. Banks in the GCC are investing more in digital transformation to satisfy consumer expectations, lower transaction costs, and improve service delivery [15]. Several empirical studies relate digital capacity to corporate performance. Ying and Ramamurthy [29] showed that IT-enabled skills boost bank agility and competitiveness. Digital transformation in finance improves operational effectiveness, customer retention, and product innovation [8]. These results can help a business gain and keep market share. Alzahrani and Seth [30] found that GCC banks that prioritized digital innovation enhanced service quality and reached more digitally literate users. In banks in Pakistan, digitalization has positively affected the profitability of banks [31]. Similarly, digitalization was found to be an important and positive predictor of the business performance of banks [12]. This study suggests that digital platforms enable banks to offer cross-border services and expand globally, influencing market share. Digitization provides several operational and financial benefits, but its direct impact on market share, particularly in the GCC banking sector, has received limited empirical research. Therefore, this study proposes the following.

H₁: Digitalization has a positive effect on the market share of banks in the GCC.

2.4. AI Adoption and Market Share

Robotic automation, natural language processing, and machine learning are revolutionizing digital banking. AI may help banks analyze credit risk, automate client interactions, personalize products, and provide predictive analytics [32]. These talents improve strategic differentiation and operational efficiency in competitive markets. AI boosts customer-centric innovation. According to Ghosh [21], AI technology enables enterprises to foresee market trends and create customized services, thereby improving consumer loyalty and market penetration. Personalized banking

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with algorithm-driven financial advice, intelligent chatbots, and real-time fraud detection increases customer acquisition and retention [33].

AI deployment improves European banking industry ROA [34] and consumer happiness with banking services [35]. AI is central to GCC national transformation initiatives. The UAE appointed a Minister of State for Artificial Intelligence and issued the UAE AI Strategy 2031, indicating significant institutional support for AI in banking [36]. Despite this strategic focus, not enough firm-level empirical research has examined how AI adoption influences market share. Most research focuses on internal efficiency or customer satisfaction. This study addresses this gap by creating a bank-level AI Adoption Index and assessing its effect on market share using dynamic panels. Therefore, this study hypothesizes.

H₂: AI adoption has a positive impact on the market share of banks in the GCC.

2.5. Firm and Macroeconomic Control Variables

Controlling for other bank performance variables is necessary to separate the net effect of digitalization and AI adoption on market share. ROA is a common metric of operational efficiency and profitability. Singh et al. [37] suggested that ROA is an important variable to be controlled. Another important control variable is the market-to-book ratio (MB), which indicates investor expectations and corporate value. High MB ratios indicate growth potential and may affect consumer and investor perception and market share [38]. LDR measures a bank's liquidity and credit growth. A higher LDR may imply aggressive lending, but it can also expose the bank to liquidity concerns, affecting its long-term sustainability and market trust [39]. Bank size varies among banks. Large bank size can affect investment in technologies and enable strategic decisions like digital investments [40]. Therefore, this study controls for bank size.

Inflation and GDP growth indicate economic health. Credit demand and financial activities increase with economic growth, influencing market dynamics. Inflation reduces buying power and increases default risks, which may hurt bank competitiveness [2]. Combining these control variables, the study comprehensively evaluates institutional, financial, and environmental market share determinants.

3. RESEARCH METHODOLOGY

3.1. Research Design

The impact of digitalization and AI adoption on the market share of banks operating in the GCC region is examined in this study using a quantitative research design and secondary panel data analysis. The choice of panel data approach is motivated by its ability to account for both cross-sectional (between banks) and time-series (across years) variation, thus improving the robustness and generalizability of the findings [24]. The study employs a longitudinal design, allowing the assessment of dynamic effects and controlling for unobserved heterogeneity and endogeneity through the use of GMM estimators.

3.2. Data Collection and Sample

The data used in this study are derived from secondary sources, including bank-level financial statements, central bank reports, and databases such as Bloomberg, Refinitiv Eikon, and official GCC banking supervision authorities. The study focuses on five countries: Saudi Arabia, the United Arab Emirates, Kuwait, Qatar, and Oman, excluding Bahrain due to the unavailability of consistent bank-level digitalization and AI data. The final sample comprises 400 bank-year observations from 40 banks, spanning ten years (2015–2024). Banks included in the sample were selected based on the availability of data on digital and AI indicators, market share, and key financial metrics. The sample comprises both Islamic and conventional banks to capture the heterogeneity of the regional banking sector.

3.3. Measurement of Variables

3.3.1. Dependent Variable

The dependent variable of this study is Market Share (MS). This variable is measured as the ratio of a bank's total assets to the total banking sector assets within its country, following prior literature [41]. This variable reflects the competitive standing of a bank in its respective national market.

3.3.2. Independent Variables

This study proposes two independent variables related to digitalization and AI adoption. The Digitalization Adoption Index (DAI) is a composite index capturing the extent of digital technology integration by each bank. The index aggregates measures such as the number of digital services offered (e.g., mobile apps, internet banking, digital and smart systems, and cybersecurity), digital transaction volume, and IT expenditure as a percentage of total operating costs. The AI Adoption Index (AIAI) is a newly constructed index reflecting AI utilization at the bank level. This includes AI-enabled features such as chatbots, robot-advisors, automated credit scoring, AI-driven fraud detection systems, and investment in AI infrastructure.

3.3.3. Control Variables

Based on the context of this study, which includes banks in five countries and is based on prior literature, this study controls for five variables. The study controls for ROA, which is a proxy for profitability, calculated as net income divided by total assets. It also controls for MB, which reflects the market valuation of the bank relative to its book value. LDR is controlled, which captures liquidity and credit risk exposure.

Bank Size (Bank-Size) is the natural logarithm of total assets (Ln(total assets)). Gross Domestic Product (GDP) is the annual GDP growth rate for the host country, capturing macroeconomic performance. Lastly, Inflation (Inf) is the annual inflation rate, included to control for purchasing power fluctuations and the monetary environment. Table 1 presents the measurement of the variables, along with their definitions and sources.

Table 1. Measurement of variables.

Variable	Code	Definition	Source
Market share	MS	Bank's total assets / Total assets of all banks in the same country	Refinitiv
Digitalization adoption	Dig. Adop. Ind.	An index using keywords such as: Digital, digitalization, digitization, digital transformation, mobile internet, mobile application / App, technology adoption, cybersecurity, smart systems, software, system, dashboard, digital strategy	Annual reports
AI adoption index	AI Adop. Ind.	An index using keywords: Artificial Intelligence, machine learning, big data, cloud, robotic process automation, automation, algorithm, deep learning, analytics, AI-powered, natural language processing, generative AI, robotics, chatbots, internet of things (IoT), Blockchain, quantum computing.	Annual reports
Return on assets	ROA	Net income divided by total assets	Refinitiv
Market-to-Book Ratio	MB	Valuation of the bank relative to its book value.	Refinitiv
Loan-to-Deposit Ratio	LDR	Total Loans / Total Deposits	Annual reports
Bank Size	BSize	Natural Logarithm of Total Assets (Ln(Total Assets))	Annual reports
Gross Domestic Product growth rate	GDP	Annual GDP growth rate for the host country	Refinitiv
Inflation Rate	Inf	Annual inflation rate	Refinitiv

3.4. Model Specification

To examine the effect of digitalization and AI adoption on market share, the study uses a dynamic panel model with the following general specification.

$$MS_{i,t} = \alpha_0 + \alpha_1 MS_{i,t-1} + \alpha_2 Dig\ Adop\ Ind_{i,t} + \alpha_3 ROA_{i,t} + \alpha_4 MB_{i,t} + \alpha_5 LDR_{i,t} + \alpha_6 BSize_{i,t} + \alpha_7 GDP_i + \alpha_8 Inf_i + e \qquad \text{(Model 1)}$$

$$MS_{i,t} = \alpha_0 + \alpha_1 MS_{i,t-1} + \alpha_2 AI\ Adop\ Ind_{i,t} + \alpha_3 ROA_{i,t} + \alpha_4 MB_{i,t} + \alpha_5 LDR_{i,t} + \alpha_6 BSize_{i,t} + \alpha_7 GDP_i + \alpha_8 Inf_i + e \qquad \text{(Model 2)}$$

$$MS_{i,t} = \alpha_0 + \alpha_1 MS_{i,t-1} + \alpha_2 Dig\ Adop\ Ind_{i,t} + \alpha_3 AI\ Adop\ Ind_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 MB_{i,t} + \alpha_6 LDR_{i,t} + \alpha_7 BSize_{i,t} + \alpha_8 GDP_i + \alpha_9 Inf_i + e \qquad \text{(Model 3)}$$

3.5. Estimation Technique

The model is estimated using the System GMM estimator, developed by Arellano and Bover [42] and Blundell and Bond [43]. This method is preferred due to its ability to control for endogeneity of explanatory variables, especially the lagged dependent variable, address autocorrelation and unobserved heterogeneity, and provide consistent estimates in the presence of a small time dimension (T) and large cross-section (N) panels. Robustness checks include the Hansen J-test for instrument validity, the Arellano-Bond test for autocorrelation in the residuals, and alternative model specifications with varying instrument sets. The validity of the Masticators is supported by the absence of second-order autocorrelation (AR(2)) and the Hansen test p-value exceeding the standard threshold of 0.1.

4. FINDINGS

4.1. Descriptive Statistics

The analysis begins with an examination of the descriptive statistics for the variables used in this study. Table 2 reports the mean, standard deviation, and range for each variable across the 400 bank-year observations. The results reveal substantial variability in the digital maturity and performance indicators of banks operating in the GCC region. The average market share is approximately 0.112, with a relatively small standard deviation of 0.117, suggesting homogeneity in the competitive standing of banks across countries. The Digitalization Adoption Index (DAI) has a mean of 350.5 and a maximum value of 1,258, highlighting uneven levels of investment in digital technologies across institutions. Similarly, the AI Adoption Index (AIAI) shows a mean of 11.03 and ranges from 0 to 126, reflecting divergent levels of AI capability integration. In terms of firm performance, the average ROA is 1.5%, and the market-to-book ratio (MB) averages 1.30, indicating moderate profitability and investor valuation. The loan-to-deposit ratio (LDR) of 0.89 suggests that banks, on average, maintain a relatively balanced credit expansion policy. The average bank size is 24, with low variation, which may reflect regulatory harmonization across GCC banking sectors. Macroeconomic indicators such as GDP growth and inflation averaged 2.8% and 1.9%, respectively, consistent with regional economic trends during the study period.

Table 2. Descriptive Statistics.

Statistics	MS	Dig.Adop.Ind.	AI Adop.Ind.	ROA	MB	LDR	BSize	GDP	Inf
Mean	0.112	350.498	11.035	0.015	1.300	0.893	24.156	0.028	0.019
Std. Dev.	0.117	252.170	16.271	0.012	0.677	0.197	1.077	0.127	0.019
Min.	0.004	0.000	0.000	-0.026	0.395	0.567	22.067	-0.299	-0.026
Max.	0.594	1258	126	0.157	5.571	1.979	26.598	0.329	0.051
Count	400	400	400	400	400	400	400	400	400

4.2. Correlation Analysis

The correlation matrix (Table 3) provides preliminary insights into the relationships among key variables. Notably, market share exhibits moderate positive correlations with both DAI (r=0.287) and AIAI (r=0.304),

suggesting a potential association between technological adoption and competitive positioning. A particularly strong correlation is observed between market share and bank size (r=0.643), indicating that bank size plays a critical role in shaping banks' strategic outcomes. The correlations between DAI and AIAI (r=0.602) reflect the interdependence of digital and AI capabilities, as banks that invest in digital infrastructure are likely to also integrate AI tools. Importantly, no correlation coefficients exceed the conventional multicollinearity threshold (r > 0.85), which supports the suitability of the dataset for multivariate regression analysis.

Table 3. Correlation matrix.

Variables	MS	Dig.Adop.Ind.	AI Adop.Ind.	ROA	MB	LDR	BSize	GDP	Inf
MS	1								
Dig.Adop.Ind.	0.287	1							
AI Adop.Ind.	0.304	0.602	1						
ROA	0.074	−0.084	0.001	1					
MB	0.162	0.125	0.212	0.163	1				
LDR	−0.174	0.045	−0.028	−0.009	−0.005	1			
BSize	0.643	0.265	0.444	0.262	0.338	−0.184	1		
GDP	−0.011	0.206	0.201	−0.005	0.056	0.032	0.121	1	
Inf	−0.030	0.054	0.089	0.128	0.093	−0.076	0.068	0.226	1

4.3. Dynamic Panel GMM Estimation

To evaluate the impact of digitalization and AI adoption on market share, dynamic panel models were estimated using the GMM approach. This method accounts for endogeneity, unobserved heterogeneity, and autocorrelation, thereby providing more robust estimates in a panel context. Three models were specified, progressively including digitalization and AI adoption as independent variables, alongside relevant control variables, as shown in Table 4. Across all models, the lagged dependent variable (MS_{t-1}) is positive and highly significant ($p < 0.01$), confirming the persistence of market share over time. This finding underscores that the current competitive position is insignificantly influenced by past performance, validating the choice of a dynamic modeling approach. In Model 1, which includes only DAI, the coefficient is positive and significant ($\beta = 0.076$, $p < 0.01$), suggesting that higher levels of digital adoption are associated with greater market share. Model 2, which includes only AIAI, shows that AI adoption is also a significant predictor of market share ($\beta = 0.053$, $p < 0.01$). Model 3, the fully specified model, includes both DAI + AIAI. Both variables remain statistically significant and positively related to market share (DAI: $\beta = 0.067$; AIAI: $\beta = 0.049$; $p < 0.01$), providing strong evidence that digitalization and AI technologies jointly enhance a bank's competitive standing in the GCC.

Among the control variables, several exhibit significant effects on market share. ROA is consistently positive and significant (β range: 0.048–0.093, $p < 0.01$), highlighting the importance of financial performance in expanding market presence. The market-to-book ratio and loan-to-deposit ratio also show positive effects across models, suggesting that banks with stronger market valuation and more active credit operations tend to hold larger market shares. Bank size emerges as a particularly influential variable, with coefficients ranging from 0.169 to 0.293 ($p < 0.01$), implying that bank size enhances strategic decision-making and innovation adoption. Conversely, GDP growth and inflation do not show significant effects, suggesting that macroeconomic fluctuations exert limited influence on bank-level market competitiveness in this context.

Model diagnostics support the validity of the estimates. The Hansen J-test p-values (range: 0.307–0.368) confirm the appropriateness of the instruments, while Arellano-Bond tests reveal the presence of first-order but not second-order serial correlation, validating the dynamic specification. The Wald chi-squared statistics are highly significant ($p < 0.001$) across all models, confirming the joint relevance of the regressors.

Table 4. Panel GMM Regression Results.

Dependent Variable: Market Share			
	Model 1	**Model 2**	**Model 3**
MS_{t-1}	0.092***	0.088***	0.125***
Dig.Adop.Ind.	0.076***	–	0.067***
AI Adop.Ind.	–	0.053***	0.049***
ROA	0.093***	0.068***	0.048***
MB	0.035**	0.042**	0.039**
LDR	0.130***	0.142***	0.155***
BSize	0.293***	0.169***	0.227***
GDP	0.016	0.021	0.010
Inf	0.013	0.011	0.017
Constant	0.221**	0.196**	0.295**
Hansen Test	0.310	0.368	0.307
AR (1)	0.010	0.033	0.010
AR (2)	0.203	0.264	0.211
Wald Chi²	962.646 (0.000)	997.764 (0.000)	899.856 (0.000)

Note: ***, ** are the statistical significance levels at 0.01 and 0.05, respectively.

4.4. Robustness Checks

To further assess the robustness of the results, alternative model specifications were estimated by modifying the lag structure and instrument sets. The results remain consistent with the main findings. In the robustness models, both DAI and AIAI continue to exhibit positive and significant effects on market share (DAI: β = 0.048–0.057; AIAI: β= 0.038–0.061; p < 0.01). Control variables such as ROA, MB, LDR, and board size also retain their significance and expected signs. Moreover, all robustness models satisfy key GMM assumptions. The Hansen tests confirm instrument validity, and the Arellano-Bond AR(2) tests show no second-order serial correlation. These results reinforce the credibility and stability of the original estimations and support the inference that the observed effects are not driven by model specification or estimation bias.

Table 5. Robustness of results_ Panel GMM regression.

Dependent variable: Market share			
	Model 1	**Model 2**	**Model 3**
MS_{t-1}	0.059**	0.042**	0.063**
Dig.Adop.Ind.	0.057***	–	0.048***
AI Adop.Ind.	–	0.038***	0.061***
ROA	0.076**	0.060**	0.055**
MB	0.048**	0.051**	0.043**
LDR	0.097***	0.108***	0.076***
BSize	0.164***	0.153***	0.190***
GDP	0.010	0.027	0.018
Inf	0.021	0.028	0.023
Constant	0.182**	0.163**	0.170**
Hansen Test	0.229	0.294	0.203
AR (1)	0.015	0.027	0.031
AR (2)	0.296	0.243	0.277
Wald Chi²	796.724 (0.000)	862.118 (0.000)	738.831 (0.000)

Note: ***, **, * are the statistical significance levels at 0.01 and 0.05, respectively.

Table 5 demonstrates a strong and statistically significant relationship between both digitalization and AI adoption and bank market share in the GCC. Banks that invest in digital platforms and AI capabilities are more likely

to enhance their competitive positioning, even after accounting for financial performance and macroeconomic conditions. Multiple model specifications yield reliable findings that are compatible with the RBV and DCT, which emphasize internal capabilities and adaptive transformation as strategic assets. These findings provide further empirical evidence on digital competitiveness and practical recommendations for GCC banking executives and regulators. The results demonstrate that banks must invest in advanced digital and AI infrastructure for operational advantages and market presence in a region where government development objectives stimulate technological progress.

5. DISCUSSION

This study demonstrates that digitalization and AI adoption boost the GCC bank market share. The results support the RBV and DCT, indicating that companies possessing and dynamically deploying advanced technology capabilities have a competitive advantage. The DAI is positively and statistically strongly connected with bank market share. This suggests that digital skills assist banks in improving operational efficiency, customer experience, and service reach [7-10]. Online banking, smartphone applications, and real-time transaction technologies improve customer engagement and market share. Previous research has shown that digital transformation enhances market competitiveness by boosting responsiveness and reducing service delivery costs [12, 17, 44]. In the GCC, where national regulations expressly support digital banking modernization, proactive digital adoption appears to increase market share. Market share also increased with the AI Adoption Index [45]. This highlights AI's growing importance in banking competitive differentiation. AI-powered chatbots, predictive analytics, fraud detection, and robo-advisory systems reduce back-office procedures and personalize financial services, enhancing consumer satisfaction and loyalty [21]. AI improves market share, supporting prior findings from developed countries that businesses that incorporate AI are better able to recognize market trends, target consumer requirements, and respond to competitive challenges [5, 6, 46].

This research is one of the first region-specific empirical studies that relate AI deployment directly to market share. DAI and AIAI's constant importance in fully defined models shows that these technological skills drive market competitiveness together. According to DCT, organizations that coordinate numerous types of technological innovation are more agile and adaptable [14, 27]. Banks that build both core digital infrastructure and innovative AI-driven systems are likely to outperform their counterparts in the competitive and more digitalized GCC financial market. The findings also illuminate control variables. Consistent with performance literature, the considerable positive link between ROA and market share shows that profitability remains a key competitive advantage [37]. According to the market-to-book and loan-to-deposit ratios, investor confidence and active credit operations increase client acquisition and retention. Bank size is one of the most effective control factors, suggesting that banks with larger assets have the ability to influence innovation adoption and performance. This supports research that emphasizes bank size can affect value generation and technology-led initiatives [40].

Macroeconomic variables such as GDP growth and inflation were not statistically significant, suggesting that firm-level technology and governance characteristics may explain GCC bank market share variations more than external economic conditions. This is especially important for emerging economies with diverse institutional quality, legal frameworks, and digital infrastructure. It shows that internal talents are increasingly determining banking competitive advantage rather than economic volatility. These findings are robust across numerous model specifications, adding to the literature supporting digital transformation's strategic importance in banking. This study emphasizes market share as a key, outcome-oriented indicator of digital competitiveness, unlike previous studies that focused on profitability or consumer engagement. It addresses a significant literature gap and has practical consequences for banking executives seeking long-term strategic advantages from technology. Based on the above, it can be concluded that digitization and AI are now key to GCC banking's competitive strategy. These technologies,

when paired with supporting governance frameworks and implemented as dynamic capabilities, can help banks survive and expand in a digital regional and global financial ecosystem.

6. IMPLICATIONS AND NOVELTY OF THE STUDY

This study builds on the RBV and DCT to discuss digital transformation, strategic management, and how well banks perform their functions. This study examines market share, a forward-looking and externally validated measure of competitive positioning, instead of cost efficiency, employee productivity, or customer satisfaction [5-10]. It supports the RBV by showing that digital and AI skills are strategically important, rare, and unique assets that can directly affect a company's market position. The study validated DCT even more by showing that having resources is not enough to give a competitive edge; banks also need to be able to adapt, integrate, and rearrange those resources in response to changes in technology and the market [14]. The fact that digitalization and AI adoption lead to more market share supports the notion that these technologies work together to make organizations more flexible and responsive in fast-changing environments like the GCC banking industry. Composite indices for digitalization and AI adoption add empirical rigor and detail, filling a well-known gap in previous studies that used binary or straightforward metrics. This improved evaluation helps analyze the depth and strategic impact.

The results show bankers how smart investments in AI and digital technology can help them gain more market share. The results demonstrate that banks can increase their market share by investing in digital platforms and AI-based decision-making tools. Digital transformation is a vital component of competitive strategy, not just an operational benefit. To enhance market performance, banks should implement integrated digital-AI frameworks, promote a data-driven culture, and align technical investments with business goals. Bank size's impact on market share highlights the importance of larger assets in enabling digital transformation. Larger bank size can provide stronger strategic insight and cross-functional experience for technology deployment. This study provides empirical evidence for national banking digital innovation initiatives for policymakers and regulators. Digitalization-related regulations such as sandboxes, open banking frameworks, and AI standards can increase the competitiveness of banks. GCC governments, which have launched forward-looking digital agendas, should continue to reduce implementation barriers, incentivize technological investments, and strengthen ecosystem cybersecurity and digital literacy to promote digital and AI innovation.

This study offers a novel contribution to the intersection of digital transformation and competitive strategy by being among the first empirical investigations to examine the joint effect of digitalization and AI adoption on market share in the banking sector, specifically within the GCC context. Most prior research has either focused on internal outcomes such as efficiency or innovation or has examined technology adoption in isolation (e.g., digitalization without AI). By introducing a dual-technology perspective and using newly constructed composite indices for both digitalization and AI at the bank level, this study provides a more comprehensive understanding of how technological capabilities influence market-oriented outcomes. Dynamic panel data, such as GMM methodologies, address endogeneity, unobserved heterogeneity, and persistence effects in market share performance, which prior research disregarded. The focus on the GCC, which is undergoing rapid digital change due to state-led efforts, gives context and fills a geographical and institutional gap in the literature. The study enhances empirical and theoretical studies on digital competitiveness in emerging countries.

The findings suggest that GCC banks and policymakers should pursue a structured roadmap for digital and AI adoption. First, banks should prioritize building foundational digital infrastructure (e.g., secure platforms, mobile banking, and cybersecurity systems) before scaling AI tools. Second, progressive AI adoption, such as chatbots, automated credit scoring, and fraud detection, should be aligned with business strategies to enhance customer experience and market positioning. Third, capacity-building programs are needed to improve employee digital literacy and data-driven culture, ensuring effective use of new technologies. For regulators, policies should incentivize technological investment through sandboxes, innovation grants, and harmonized AI standards, while strengthening

cybersecurity and compliance frameworks. Collectively, this roadmap enables sustainable technological integration, enhances competitiveness, and supports GCC digital transformation agendas.

7. CONCLUSION, LIMITATIONS, AND FURTHER RESEARCH

This study explored how digitalization and AI adoption affect the GCC bank market share. The study used the RBV and DCT to examine how technological capabilities (measured by composite indices of digitalization and AI adoption) impact banks' market share. Using a panel dataset of 400 bank-year observations and dynamic panel data estimation to address endogeneity and autocorrelation, the findings show that digitalization and AI adoption positively affect market share. These findings emphasize the strategic relevance of technology-driven innovation in banking competitiveness. Digital infrastructure and AI-enabled decision-making systems greatly influence market share performance, as well as profitability and macroeconomic situations. The study adds to digital transformation and bank performance literature, particularly in emerging digital economies like the GCC, by focusing on market share rather than financial outcomes. The study also offers practical insights for bank executives and policymakers. For banking leaders, the evidence highlights the necessity of integrating digital and AI investments into long-term strategic planning. For policymakers, the results support ongoing national initiatives that prioritize digital financial infrastructure and encourage AI innovation in the financial sector. Taken together, the study advances theoretical understanding, methodological rigor, and practical relevance in the discourse on digital competitiveness and market strategy in banking.

Despite the strengths and contributions of this study, several limitations should be acknowledged. First, the analysis is based on secondary data collected from publicly available sources, which may be subject to reporting bias or limited coverage, particularly regarding bank-level AI adoption practices. While the constructed composite indices provide a more nuanced measurement than binary proxies, they may still not fully capture the strategic depth or organizational integration of these technologies. Second, the study focuses exclusively on five GCC countries, excluding Bahrain due to data limitations. Although the selected countries represent the major players in the regional banking industry, the exclusion of one member state may slightly constrain the generalizability of the findings within the GCC. Additionally, the study does not distinguish between Islamic and conventional banks, which may differ in governance structures, innovation adoption rates, and market dynamics. Third, while the use of GMM addresses key econometric concerns such as endogeneity and unobserved heterogeneity, it relies on the validity of internal instruments and assumptions about the error structure. This study is based exclusively on publicly available secondary data. As such, no ethical clearance or informed consent was required. However, all data were handled according to academic standards for research transparency, reproducibility, and integrity.

Building on these limitations, several avenues for future research are suggested. First, researchers may consider conducting comparative analyses between Islamic and conventional banks to assess whether governance frameworks, Shariah compliance, or innovation cultures moderate the relationship between technology adoption and market share. Such comparisons would add a richer layer of context to understanding strategic digital behavior in dual banking systems. Second, future studies could adopt mixed-methods approaches by integrating qualitative interviews or case studies with quantitative analysis. This would allow for deeper exploration into organizational processes, leadership practices, and cultural factors that influence the effectiveness of digital and AI implementation. Third, expanding the geographic scope to include non-GCC emerging economies would enable cross-regional comparisons and the identification of institutional or regulatory factors that facilitate or hinder digital competitiveness. Additionally, longitudinal studies examining post-COVID-19 technological acceleration could shed light on how digital maturity influences resilience and strategic recovery in the financial sector. Finally, future research could explore the mediating or moderating roles of digital literacy, organizational agility, customer orientation, or regulatory support in shaping the digitalization–market share nexus. Such models would provide a more comprehensive understanding of the mechanisms through which technological capabilities impact competitive outcomes.

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