

POLICY RECOMMENDATIONS FOR ENHANCING THE COMPETITIVENESS AND BUSINESS PERFORMANCE OF DIGITAL BANKS IN VIETNAM

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ABSTRACT

The digital transformation of the banking sector is reshaping competitive dynamics, requiring institutions to align technological innovation with service quality, human capital, and customer experience. Despite growing global attention, limited empirical research explores the specific determinants of competitiveness and business performance in digital banks within emerging markets. Thus, this study develops and empirically validates a structural equation model to examine the key factors influencing digital bank competitiveness and performance in Vietnam. A mixed-methods approach was adopted, combining qualitative insights from 30 expert interviews with a large-scale survey of 935 digital banking professionals across five major cities. Fourteen hypotheses and one moderating effect were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 3.0. The findings reveal that customer satisfaction is the strongest predictor of both competitiveness and business performance, with service quality, digital human resources, and financial technology also exerting significant direct and indirect effects. Digital transformation not only enhances performance directly but also moderates the relationship between customer satisfaction and performance. The validated model accounts for 33.9% of the variance in business performance and 32.7% in competitiveness. This study contributes a novel integrative framework that highlights the interplay between customer-centricity and digital capabilities in driving strategic outcomes. Policy recommendations include enhancing customer satisfaction mechanisms, investing in digital workforce development, and promoting strategic digital transformation initiatives. These insights provide actionable guidance for policymakers and banking leaders seeking to strengthen the resilience and performance of digital banks in emerging economies.

Keywords: Digital transformation, digital bank, financial technology, business performance

1. INTRODUCTION

The banking industry worldwide has been undergoing a paradigm shift due to the widespread adoption of digital technologies. This transformation has become even more pronounced as digital banking evolves from a supplementary channel to a core strategic pillar (Molla et al., 2023). As the competition intensifies in the financial services sector, digital banks are compelled to

strengthen their competitive capabilities and enhance their business performance to survive and thrive in a rapidly evolving market (Cieslak & Valor, 2025). Background and context: In Vietnam, the government's strong push toward a digital economy, exemplified by the National Digital Transformation Program, has accelerated the digitization of the banking sector. Central Vietnamese banks such as Vietcombank and VPBank have made significant investments in digital platforms, fintech partnerships, and data-driven decision-making. According to the State Bank of Vietnam, over 95% of banking transactions in 2023 were processed through digital channels. Despite these advancements, achieving a sustainable competitive edge and high business performance remains a significant challenge due to intensifying market dynamics, increasing customer sophistication, and rapid technological change.

The theoretical foundation of the study is grounded in multiple theoretical perspectives. The resource-based view suggests that banks can achieve sustained competitive advantage by developing valuable, rare, inimitable, and non-substitutable resources such as digital human capital and fintech capabilities (Herdinata et al., 2025). The technology-organization-environment framework also provides a lens to understand how digital transformation and financial technology are adopted and integrated into business operations (Pavithra & Sundari, 2025). Additionally, customer satisfaction theory and the service quality model underpin the relationships among service experience, customer loyalty, and performance outcomes. By integrating these theoretical perspectives, the study proposes a conceptual model that captures the dynamic and multifaceted nature of competitiveness and performance in the digital banking context.

This study is relevant as it addresses the pressing challenges of digital banking in emerging economies, offering added value through an integrative model that combines customer-centric constructs with digital transformation dynamics. Moreover, the significance of the study is to contribute to the literature in several important ways: (1) Empirical contribution provides large-scale empirical evidence from Vietnam, a rapidly emerging digital economy with unique institutional and technological characteristics. (2) Model innovation introduces an integrated structural equation model that includes previously underexplored variables such as digital human resources and the moderating role of digital transformation. (3) Managerial implications give the findings offer actionable insights for digital banking managers to allocate resources, redesign services, and foster a performance-driven digital culture. (4) Policy implications of the research support regulators and policymakers in crafting supportive digital finance ecosystems and innovation-driven regulatory frameworks. Therefore, this study aims to develop and validate a structural model that investigates the determinants of digital bank competitiveness and performance, with a focus on the Vietnamese banking sector. Besides, policy recommendations are needed to enhance the competitiveness and business performance of digital banks in Vietnam.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Business performance (BP): Business performance is a critical metric for evaluating the effectiveness and competitiveness of digital banks in an increasingly technology-driven financial environment. Digital banks operate in a competitive and rapidly evolving ecosystem where innovation, user experience, and agility directly impact business outcomes (Liu et al., 2022; Chapano et al., 2023; Lambekova et al., 2025). The integration of advanced technologies such as artificial intelligence, machine learning, and big data analytics has allowed digital banks to optimize decision-making, personalize services, and reduce operational costs, thereby enhancing overall performance (Alam et al., 2024). Moreover, business performance is strongly influenced by how effectively the bank manages its digital transformation strategy, human capital, and technological infrastructure (Meng & Imran, 2024). Therefore, in the digital banking context, BP is a multidimensional construct that requires a holistic approach to measurement,

integrating both quantitative financial results and qualitative indicators of digital success. Understanding and enhancing BP is essential not only for ensuring profitability but also for building long-term resilience and innovation capacity in the face of ongoing digital disruption.

Bank competitiveness (BC): Bank competitiveness in digital banking is not only about outperforming rivals in financial metrics, but also about establishing sustainable differentiation through technology, customer-centric innovation, and digital agility (Ahmad et al., 2023). Moreover, a digitally competitive bank fosters a culture of continuous learning, innovation, and agile response to customer feedback and market trends. It emphasizes human capital development in digital competencies and maintains strategic flexibility to pivot in response to technological and customer behavior shifts (Ozili & Ndah, 2024).

Service quality (SQ): Service quality plays a pivotal role in determining the success of digital banks in an increasingly competitive and technologically advanced environment (Alarifi & Husain, 2023). Several empirical studies have confirmed that superior service quality leads to higher levels of customer satisfaction, loyalty, and positive behavioral intentions. In the digital banking environment, where switching costs are low and customer expectations are increasingly shaped by experiences with big tech firms, service quality becomes a key differentiator (Dangiso et al., 2024; Mwiya et al., 2022). Additionally, high-quality digital services improve a bank's brand perception and drive favorable customer word-of-mouth, thus reinforcing the brand image and expanding the customer base, as illustrated in H1, H2, H3, and H4 of Figure 1.

Brand image (BI): Brand image is one of the most influential intangible assets that determines customer perception and loyalty in service industries, particularly in digital banking. A strong brand image reduces perceived risk, enhances perceived value, and fosters emotional engagement, especially for financial services that involve sensitive transactions and high security expectations (Nascimento & Loureiro, 2024). Studies have demonstrated that customers are more likely to engage with digital banking platforms when they trust the brand and associate it with innovation and reliability. Furthermore, a modern and innovative brand identity signals technological competence, which enhances customer expectations regarding the quality and efficiency of digital services, as illustrated by H5 and H6 in Figure 1.

Customer satisfaction (CS): Customer satisfaction is a key outcome in service marketing and a fundamental predictor of customer loyalty, retention, and advocacy (Gonu et al., 2023). Research has consistently shown that satisfied customers are more likely to exhibit repeat purchase behavior, provide positive referrals, and resist switching to competitors. In the case of digital banks, where traditional physical interactions are replaced by technology, customer satisfaction becomes highly dependent on seamless digital interfaces, transparent processes, and prompt support (Alharthi et al., 2022). Customer satisfaction also acts as a mediating variable that links service quality, brand image, and technology with bank competitiveness and performance. When customers are satisfied, they are more inclined to remain loyal, use additional services, and participate in the co-creation of value through feedback and data sharing with H7 and H8, as illustrated in Figure 1.

Financial technology (FT): Financial technology has emerged as a transformative force in banking, reshaping service delivery, product design, and customer engagement. The adoption of FinTech enables banks to streamline internal processes, reduce operational costs, and offer 24/7 real-time services to customers. AI-driven chatbots, for example, provide instant customer support, while machine learning algorithms tailor products to individual preferences (Kayani et al., 2025). These features improve customer experience and contribute directly to performance outcomes. Additionally, FinTech is an enabler of competitive agility, as illustrated by H9 and H10 in Figure 1.

Digital human resources (DHR): Digital human resources refer to the digital competencies,

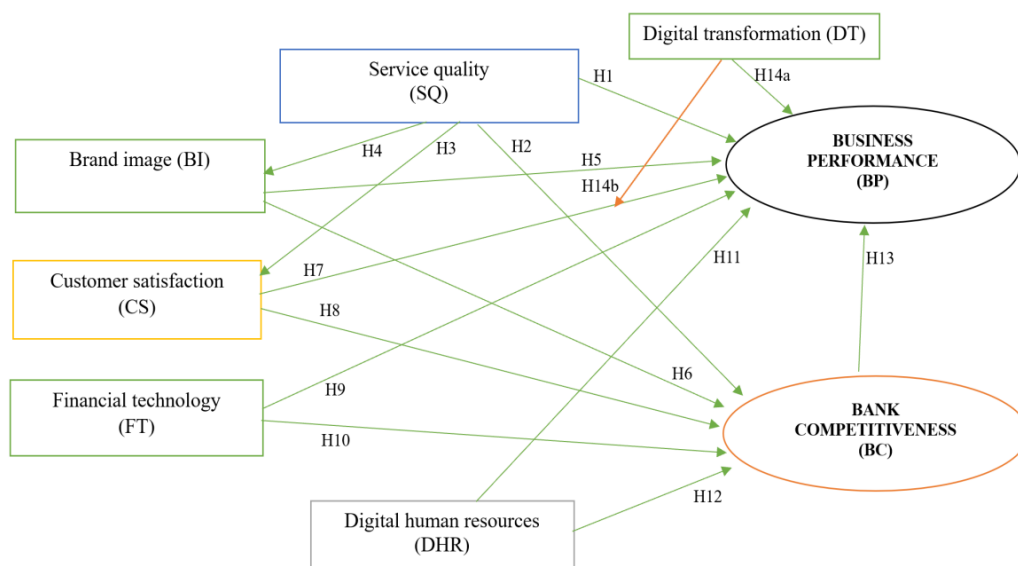
adaptability, and innovation mindset of a bank's workforce, along with the organizational support for continuous learning and transformation (Chapano et al., 2023). More importantly, an organization that invests in digital training and fosters a culture of innovation encourages proactive problem-solving, agility, and cross-functional collaboration capabilities that are essential for executing digital strategy (Theres & Strohmeier, 2023). The authors proposed the hypotheses H11 and H12 below, which are illustrated in Figure 1.

Bank competitiveness (BC): Bank competitiveness refers to a bank's ability to consistently deliver superior value through service quality, cost-efficiency, innovation, and speed to market (Kohli et al., 2024). The sustained competitive advantage arises when a firm possesses unique resources or executes strategies that rivals cannot easily replicate (Srivastava et al., 2023). In the context of this study, bank competitiveness acts as a mediating factor through which internal strategic drivers, such as digital human resources, technology, and customer satisfaction, influence performance outcomes, as illustrated in Figure 1.

Digital transformation (DT): Digital transformation is a strategic, organization-wide initiative that involves integrating digital technologies, reengineering processes, and cultivating a digital-first culture (Erdoğan, 2024). Digital transformation enables banks to enhance efficiency, personalize customer experiences, and scale innovations. It also improves operational agility, allowing banks to respond quickly to market dynamics, regulatory changes, and evolving customer expectations (Naimi-Sadigh et al., 2022). The authors proposed the hypotheses H14a and H14b below, which are illustrated in Figure 1.

This study fills a significant need in the existing literature by providing context-specific and integrative models that illustrate the interplay between internal capabilities and customer-centric outcomes in digital banking and their impact on competitiveness and performance. The case study of Vietnam sheds insight on the factors that led to the country's success and offers lessons to other developing economies that are attempting to strike a balance between technological innovation, customer trust, and financial sustainability.

Figure 1. A Research Model for Critical Factors Influencing Digital Banks' Competitiveness and Performance



Source: The authors

Figure 1 presents the research model, which includes eight core constructs along with a moderating factor (digital transformation), offering a comprehensive and updated view of the determinants of digital banks' competitiveness and performance.

3. RESEARCH METHODS

The research process was conducted in two phases: (1) qualitative exploration through expert consultation and (2) a formal quantitative survey for hypothesis testing in Figure 1.

3. 1. QUALITATIVE PHASE BASED ON EXPERT INTERVIEWS

The qualitative phase was conducted as an initial exploratory step to ensure the contextual relevance and content validity of the proposed research model. This phase involved in-depth interviews with 30 experts, including bank managers, digital transformation consultants, and academic scholars specializing in finance and banking. The purpose was to assess the appropriateness of constructs, identify potential context-specific factors, and refine measurement items before the quantitative survey was deployed. The interviews were semi-structured, guided by a protocol based on the preliminary research framework. Each session lasted approximately 45–60 minutes and was conducted either in person or via video conferencing platforms. All interviews were recorded (with consent) and transcribed verbatim. Thematic analysis was employed to extract key patterns, ensuring alignment with both theoretical foundations and the digital banking context in Vietnam. The qualitative findings validated the inclusion of core constructs such as service quality, customer satisfaction, brand image, financial technology, and digital human resources. Additionally, experts emphasized the critical role of digital transformation not only as a strategic initiative but also as a potential moderator in influencing business outcomes. Minor revisions were made to the measurement scale based on expert feedback, including rewording some indicators to enhance clarity and contextual relevance. The final questionnaire was pilot-tested with 30 respondents, confirming face validity and linguistic consistency. This qualitative groundwork strengthened the reliability and practical validity of the model and ensured that subsequent quantitative analysis would be well-calibrated to the realities of digital banking in emerging markets (Hair et al., 2019).

3. 2. THE QUANTITATIVE PHASE IS BASED ON A FOUR-STEP RESEARCH PROCESS

To rigorously test the proposed research model, the quantitative phase followed a structured four-step research process. This approach ensures methodological transparency, statistical validity, and the alignment of empirical testing with theoretical constructs.

Step 1 - Questionnaire development: The first step involved constructing a structured questionnaire based on a comprehensive review of prior literature and findings from the qualitative phase. The survey instrument comprised eight constructs: Service quality (SQ), brand image (BI), customer satisfaction (CS), financial technology (FT), digital human resources (DHR), digital transformation (DT), bank competitiveness (BC), and business performance (BP). Each construct was measured using reflective indicators on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). Measurement items were adapted from established scales and modified for the digital banking context in Vietnam. Content validity was confirmed through expert consultation during the qualitative phase. The instrument was translated into Vietnamese and back-translated into English to ensure linguistic and conceptual equivalence. A pilot test with 30 respondents was conducted to verify reliability and clarity, resulting in minor adjustments (Hair et al., 2019).

Step 2 - Data collection: The second step involved a large-scale survey administered across five major cities in Vietnam, such as Hanoi, Ho Chi Minh City, Da Nang, Can Tho, and Hai Phong, where digital banking adoption is most active. The target population consisted of bank managers, executives, and employees directly involved in digital banking operations, strategy, or IT functions. A purposive sampling technique was used, focusing on respondents with professional experience in digital banking. A total of 1.000 responses were collected, with 935 valid responses

gathered through both online (via Google Forms, accounting for 93.5%) and offline methods. Participation was voluntary and anonymous, ensuring ethical compliance and data confidentiality.

Step 3 - Reliability and validity assessment: The third step focused on assessing the reliability and validity of the measurement model using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 3.0. Internal consistency was evaluated through Cronbach's Alpha and Composite Reliability, with all constructs exceeding the recommended thresholds ($\alpha > 0.7$, CR > 0.7). Convergent validity was confirmed through Average Variance Extracted (AVE > 0.5), and discriminant validity was verified using the Fornell-Larcker criterion and the HTMT ratio. The results confirmed that all measurement items loaded significantly onto their respective constructs, indicating sound psychometric properties. This validation enabled progression to structural model analysis (Hair et al., 2019).

Step 4 - Hypothesis testing and structural model evaluation: In the final step, the structural model was evaluated to test the hypothesized relationships. Bootstrapping with N subsamples was conducted to assess path coefficients, t-statistics, and significance levels. The model explained a significant percentage of the variance in business performance and bank competitiveness, indicating substantial explanatory power. Among the 14 hypotheses, most were supported at the 0.05 level or better, validating the central role of customer satisfaction, service quality, and digital transformation. Additionally, digital transformation was found to significantly moderate the relationship between customer satisfaction and business performance, reinforcing its strategic significance. Indirect effects, such as the mediating role of bank competitiveness, were also analyzed, offering nuanced insights into how internal capabilities and customer-facing dimensions jointly drive performance outcomes. This four-step quantitative approach ensured that the research findings are both statistically robust and contextually grounded. It lays a solid foundation for theoretical generalization and practical application in the field of digital banking (Hair et al., 2019).

4. RESULTS

4. 1. DEMOGRAPHIC INFORMATION OF RESPONDENTS BASED ON THE SAMPLE

The demographic profile of the 935 respondents provides valuable insights into the characteristics of the banking professionals who participated in the study. This profile includes gender, marital status, age group, monthly income, and professional experience. **Gender:** Out of the total sample, 57.6% were female ($n = 539$) and 42.4% were male ($n = 396$). The higher proportion of female respondents reflects the increasing representation of women in the banking and financial services sector in Vietnam. **Marital status:** In terms of marital status, the majority of respondents (62.5%, $n = 584$) were married, while 37.5% ($n = 351$) were single. This demographic diversity may influence perspectives on digital banking practices and professional responsibilities. **Age group:** Respondents were concentrated mainly in the 35 to 45 age group, which accounted for 52.5% ($n = 491$) of the total. Meanwhile, 24.1% ($n = 225$) were aged 25–34, 15.7% ($n = 147$) were 45 and older, and only 7.7% ($n = 72$) were under 25. This indicates that most participants are mid-career professionals with substantial industry experience. The majority of respondents reported earnings in the higher income brackets. Specifically, 36.7% ($n = 343$) earned VND 15–20 million, and 36.5% ($n = 341$) earned more than VND 20 million per month. A smaller group reported income from VND 10 to under 15 million (22.0%), and only 4.8% earned below VND 10 million. The results suggest a relatively high-income cohort typical of professionals in banking operations or digital finance. **Working experience:** Regarding work experience in the banking sector, 38.3% ($n = 358$) of respondents had 10 to under 15 years of experience, while 34.9% ($n = 326$) had worked over 15 years. Another 21.3% ($n = 199$) had 5 to under 10 years,

and only 5.6% ($n = 52$) reported 1 to under 5 years. These data indicate that the sample consists mainly of seasoned professionals, adding credibility to the insights derived from the study.

The empirical findings confirm that customer satisfaction is the most powerful predictor of both competitiveness and business performance. This result aligns with studies in where satisfaction acted as the central driver of loyalty and profitability. In the Vietnamese context, the impact appears even stronger, as the banking industry has rapidly transitioned to digital platforms, with more than 95% of transactions processed electronically in 2023. This unique environment positions customer experience as the decisive factor for sustaining competitiveness. The results also demonstrate that digital transformation has both a direct effect on performance and a moderating effect on the satisfaction–performance relationship. Similar patterns have been reported in other studies. However, in Vietnam, digital transformation scored among the lowest mean values, suggesting that while infrastructure investment is substantial, its translation into tangible customer or financial outcomes remains gradual. This reflects the dual challenges of technological immaturity and customer adaptation in an emerging digital economy.

4. 2. TESTING CRITICAL FACTORS INFLUENCING DIGITAL BANKS' COMPETITIVENESS AND PERFORMANCE

Table 1. Testing of Std. Deviation for Factors Influencing Digital Banks' Competitiveness and Performance

Items	Code	Min	Max	Mean	Std. Deviation
Service quality (SQ)	SQ1–SQ4	1	5	3.054	1.002
Brand image (BI)	BI1–BI4	1	5	3.049	0.972
Customer satisfaction (CS)	CS1–CS4	1	5	3.024	1.004
Financial technology (FT)	FT1–FT4	1	5	2.497	0.803
Digital human resources (DHR)	DHR1–DHR4	1	5	3.408	0.938
Digital transformation (DT)	DT1–DT4	1	5	2.420	0.674
Bank competitiveness (BC)	BC1–BC3	1	5	3.307	0.984
Business performance (BP)	BP1–BP4	1	5	2.386	0.677

Source: Authors

Table 1 presents descriptive statistics for the constructs influencing digital banks' competitiveness and performance. Among the factors, Digital human resources reported the highest mean (3.408), suggesting strong perceived human capital capabilities. In contrast, digital transformation and business performance had the lowest mean scores (2.420 and 2.386, respectively), indicating perceived gaps in strategic digital implementation and outcomes. The standard deviations suggest moderate variability, especially in service quality and customer satisfaction, reflecting differing perceptions among respondents. All constructs were measured on a 5-point Likert scale.

Table 2. Testing Composite Reliability for Factors Influencing Digital Banks' Competitiveness and Performance

Code	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BC	0.892	0.906	0.933	0.823
BI	0.944	0.976	0.959	0.855
BP	0.859	0.879	0.904	0.703
CS	0.932	0.933	0.952	0.832
DHR	0.862	0.947	0.878	0.652
DT	0.878	1.013	0.914	0.727
FT	0.927	0.946	0.947	0.818
SQ	0.941	0.942	0.958	0.849

Source: Authors

Table 2 demonstrates that all constructs meet the threshold for internal consistency and convergent validity. Composite Reliability values exceed 0.87 across all variables, indicating strong internal reliability. Average Variance Extracted (AVE) values also surpass the 0.5 benchmark, with the highest for brand image (BI = 0.855) and the lowest for digital human resources (DHR = 0.652). These results confirm that the constructs are well-measured and suitable for further structural equation modeling (SEM) analysis.

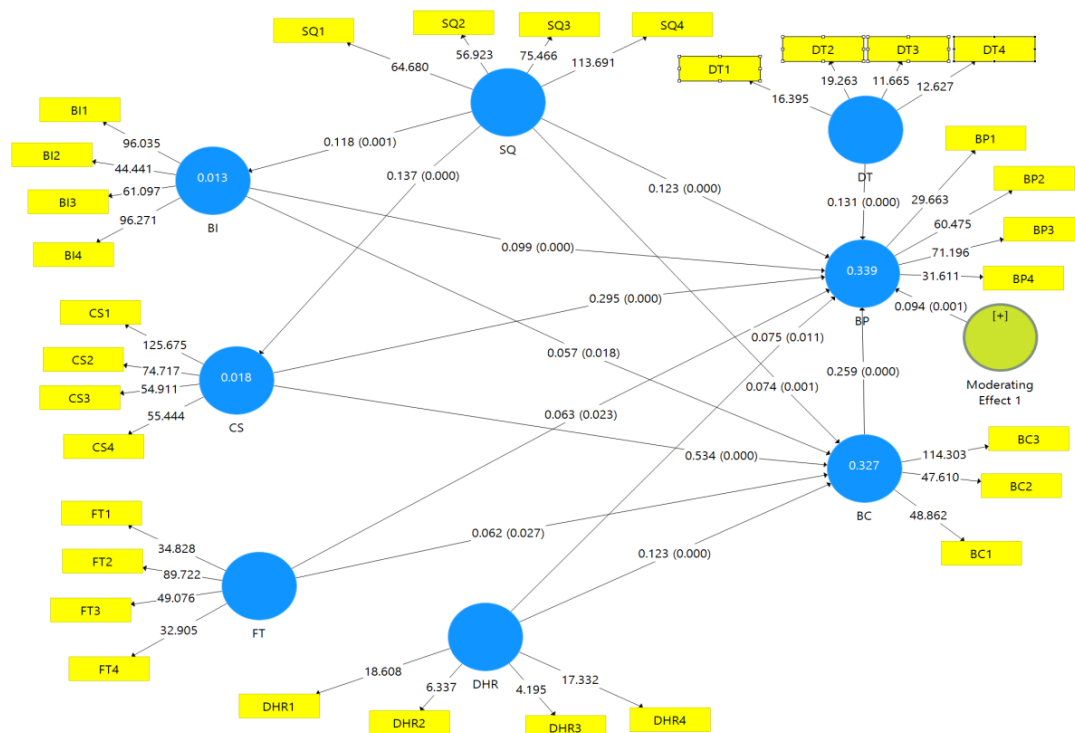
Table 3. Testing Factors Influencing Digital Banks' Competitiveness and Performance

Relationship	Path coefficient				
	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics (O/STDEV)	P Values
BC → BP	0.259	0.261	0.033	7.890	0.000
BI → BC	0.057	0.056	0.024	2.386	0.017
BI → BP	0.099	0.100	0.024	4.157	0.000
CS → BC	0.534	0.534	0.030	18.110	0.000
CS → BP	0.295	0.293	0.032	9.315	0.000
DHR → BC	0.123	0.126	0.032	3.829	0.000
DHR → BP	0.075	0.076	0.029	2.562	0.011
DT → BP	0.131	0.135	0.024	5.540	0.000
FT → BC	0.062	0.063	0.028	2.200	0.028
FT → BP	0.063	0.063	0.026	2.384	0.017
Moderating Effect 1 → BP	0.094	0.091	0.028	3.330	0.001
SQ → BC	0.074	0.074	0.023	3.141	0.002
SQ → BI	0.118	0.116	0.033	3.611	0.000
SQ → BP	0.123	0.123	0.026	4.692	0.000
SQ → CS	0.137	0.137	0.030	4.485	0.000
Relationship	Specific Indirect Effects				
	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics (O/STDEV)	P Values
SQ → BI → BC	0.007	0.007	0.004	1.911	0.056
SQ → CS → BC	0.073	0.073	0.017	4.248	0.000
BI → BC → BP	0.015	0.015	0.007	2.259	0.024
SQ → BI → BC → BP	0.002	0.002	0.001	1.867	0.062
CS → BC → BP	0.139	0.139	0.019	7.228	0.000
SQ → CS → BC → BP	0.019	0.019	0.005	3.593	0.000
DHR → BC → BP	0.032	0.033	0.009	3.363	0.001
FT → BC → BP	0.016	0.016	0.008	2.100	0.036
SQ → BC → BP	0.019	0.019	0.007	2.718	0.007
SQ → BI → BP	0.012	0.012	0.004	2.796	0.005
SQ → CS → BP	0.040	0.040	0.010	4.043	0.000
Code	R Square Adjusted				
	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics (O/STDEV)	P Values
BC	0.327	0.331	0.032	10.159	0.000
BI	0.013	0.014	0.008	1.664	0.096
BP	0.339	0.345	0.027	12.337	0.000
CS	0.018	0.019	0.008	2.123	0.034

Source: Authors

Table 3 demonstrates strong empirical support for the proposed research model. The path from Customer Satisfaction (CS) to Bank Competitiveness (BC) ($O = 0.534, p < 0.001$) and CS to Business Performance (BP) ($O = 0.295, p < 0.001$) reveals that customer satisfaction is the most influential driver in the model. Additionally, bank competitiveness significantly enhances Business Performance ($O = 0.259, p < 0.001$), indicating a strong mediating role. Service Quality (SQ) shows multiple significant paths positively affecting BI, CS, BC, and BP, highlighting its foundational role. Digital transformation (DT) demonstrates a meaningful direct influence on BP ($O = 0.131, p < 0.001$) and a moderating effect between CS and BP ($O = 0.094, p = 0.001$), underscoring its strategic value. The indirect effects further emphasize the central role of CS and SQ, primarily through mediating chains like $SQ \rightarrow CS \rightarrow BC \rightarrow BP$ and $CS \rightarrow BC \rightarrow BP$, both highly significant. Other constructs such as brand Image (BI), Financial technology (FT), and digital human resources (DHR) also contribute, though with more modest path coefficients. R-squared values indicate that the model explains 33.9% of the variance in BP, 32.7% in BC, and 1.8% in CS, reflecting moderate explanatory power. Overall, the SEM results provide robust empirical validation for the hypothesized model in the context of digital banking performance.

Figure 2. Testing SEM for Factors Influencing Digital Banks' Competitiveness and Performance



Source: Authors

Figure 2 illustrates the relationships among key constructs influencing digital banks' competitiveness and performance. All significant paths are depicted with standardized coefficients, confirming the direct and indirect influences identified in Table 3. The diagram emphasizes customer satisfaction and service quality as central drivers, while digital transformation plays both a direct and moderating role. The model structure highlights a multidimensional framework where internal resources, technology, and customer perceptions collectively shape strategic banking outcomes in the digital era.

5. DISCUSSION OF FINDINGS

The structural equation model results provide valuable empirical insights into the fundamental drivers of competitiveness and business performance in digital banking. This section addresses the findings in light of previous research, theory, and practical consequences for bank managers.

1. The findings significantly indicate the central role of customer satisfaction (CS) in determining both bank competitiveness (BC) and business performance. This is consistent with previous research (Alharthi et al., 2022), which has identified satisfaction as a key predictor of loyalty, advocacy, and repeat behavior.
2. The study also found that bank competition has a substantial mediating effect on the relationship between internal capabilities and performance results. The path from BC to BP ($\beta = 0.259$, $p < 0.001$) supports the notion that competitiveness serves as a strategic conduit for converting intangible resources into concrete business benefits (Srivastava et al., 2023).
3. Among internal factors, service quality (SQ) was discovered to have broad and consistent beneficial effects on customer satisfaction, brand image (BI), competitiveness, and performance. This supports the critical importance of high-quality digital services in shaping user perceptions and organizational outcomes (Dangaiso et al., 2024; Mwiya et al., 2022). The indirect influence of SQ on BP via CS and BC is particularly noteworthy, highlighting the multifaceted impact of service delivery.
4. The findings emphasize the importance of digital human resources (DHR), which benefit both BC and BP. This is consistent with previous research indicating that staff adaptability, digital skills, and an innovation-driven culture are critical in the digital banking context (Liu et al., 2022; Chapano et al., 2023; Hunady et al., 2025; Zureigat et al., 2025). Likewise, financial technology (FT) had statistically significant, but moderate, effects. This lends support to the concept that, while FinTech improves efficiency and customisation, its full performance impact is realized only when combined with solid human and strategic foundations.
5. This study makes a significant addition by confirming the moderating influence of digital transformation (DT) in the relationship between customer happiness and corporate performance. The interaction effect ($\beta = 0.094$, $p = 0.001$) suggests that banks with sophisticated digital capabilities can better convert consumer pleasure into financial and market outcomes (Iuga, 2025; Mensah & Khan, 2024). This research adds to the expanding literature on strategic alignment in digital transformation by emphasizing that technology must be integrated not only operationally but also strategically to provide higher value.

The advent of digital banking is altering the global financial scene, necessitating not only technological innovation but also strategic alignment in service quality, human resources, and customer experience. However, limited empirical research has thoroughly examined how these characteristics affect competitiveness and corporate performance in emerging economies.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1. CONCLUSIONS

This study examined the key factors influencing the competitiveness and business performance of digital banks in Vietnam through an integrated structural equation model. The findings provide strong empirical evidence supporting the proposed theoretical framework. Notably, customer satisfaction emerged as the most influential factor, significantly impacting both competitiveness and performance. Service quality also played a foundational role by influencing brand

image, customer satisfaction, and both outcome variables. The results affirm the strategic relevance of digital transformation, which not only directly enhances performance but also moderates the effect of customer satisfaction on performance. Additionally, internal capabilities such as digital human resources and financial technology contributed meaningfully, albeit with lower path coefficients. The model explained 33.9% of the variance in business performance and 32.7% in bank competitiveness, suggesting moderate explanatory power. The inclusion of both direct and indirect effects provides a more comprehensive understanding of how digital banks can leverage internal and external resources to gain a competitive advantage. The sustainable performance in digital banking requires a balanced focus on customer-centricity, service excellence, technological adoption, and organizational digital readiness. The study contributes to theory by validating a multidimensional SEM model and offers practical implications for strategic decision-making in digital financial services.

6. 2. POLICY RECOMMENDATIONS

The study is also based on the empirical results and practical context of Vietnam's digital banking ecosystem, and several policy recommendations are proposed for regulators, industry leaders, and financial institutions:

1. Policy recommendation for customer satisfaction: Customer satisfaction should be integrated into bank licensing and supervisory frameworks. The satisfaction metrics can be included as soft criteria in granting approvals for expanding digital-only branches or launching new digital products. This aligns regulatory oversight with user-centric outcomes. At the institutional level, banks should be encouraged to invest in customer experience analytics, user journey mapping, and personalized engagement. Support for real-time feedback tools, AI-powered service optimization, and sentiment analysis can help banks respond faster to customer needs. Banks that consistently achieve high satisfaction ratings should receive regulatory incentives such as innovation sandbox privileges or tax exemptions for R&D in service design. Moreover, integrating customer satisfaction into the national financial inclusion strategy will help promote trust among underserved populations. Satisfied users are more likely to adopt formal digital banking, which contributes to broader socio-economic development goals. In sum, elevating customer satisfaction from a marketing goal to a policy instrument will enhance not only individual bank performance but also the overall maturity and competitiveness of Vietnam's digital financial ecosystem. Customer satisfaction with digital banking services is a core factor determining the success and competitiveness of commercial banks in the context of substantial digital transformation today. The research results help commercial banks in Vietnam better understand the level of customer satisfaction, expectations, and factors affecting the quality of digital banking services. From there, banks can develop strategies to improve services, enhance customer experience, and increase competitive advantage.
2. Policy recommendation for digital transformation: The public investment in shared infrastructure such as national digital ID verification, real-time payment rails, and open banking architecture would significantly lower transformation costs for small and mid-tier banks. Tax relief or transformation matching grants can be offered to institutions with credible transformation roadmaps. The executive leadership capability is critical, and regulatory bodies should mandate periodic digital governance assessments and encourage digital board training certification for the leaders in banks. To ensure DT improves performance, regulators should link digital transformation initiatives with customer outcome metrics. Banks must demonstrate that transformation investments

result in improved accessibility, personalization, or inclusion, beyond just back-end efficiency. Finally, cross-sector collaboration with telecommunications, e-commerce, and technology partners should be incentivized to facilitate integrated digital ecosystems. These ecosystems improve data quality, service reach, and financial inclusion outcomes. Effective digital transformation policy must blend infrastructure, leadership, customer value, and ecosystem readiness, not just technology investment, to realize whole business and economic returns. In addition, commercial banks must continually update their understanding of technology trends and consumer behavior to adjust their digital banking service development strategies appropriately, thereby constantly improving customer experience and maintaining a sustainable competitive advantage.

3. Policy recommendation for service quality: The national banking exams and supervisory audits should integrate digital quality assessments, not just traditional financial or compliance reviews. Customer service bots or mobile apps should meet minimum quality benchmarks defined by regulatory bodies. The consumer protection frameworks must evolve to cover digital grievances such as failed transfers, digital onboarding issues, or system downtimes. The national digital banking ombudsman system can help resolve unresolved complaints rapidly and reasonably. Regulators should incentivize innovation in digital service quality. Banks that design inclusive, user-friendly interfaces, e.g., for elderly or disabled users should receive public recognition, fast-track product approvals, or innovation vouchers. The collaborative quality improvement programs can be launched with universities and startups through regulatory-fintech innovation hubs. Banks can co-develop and test service enhancements in controlled environments before rollout. Ultimately, treating service quality as both a regulatory obligation and competitive differentiator can raise standards across the sector and significantly improve customer experience and trust in digital banking. Enhance service quality and transaction processing speed (CT) by investing in an upgraded technology system, which optimizes operational performance to ensure swift transaction processing, minimizing technical errors and service interruptions.
4. Policy recommendation for digital human resources: Government co-sponsored scholarships for FinTech and AI programs. Publicly funded online reskilling platforms for bank employees in rural provinces. The government should encourage talent mobility across sectors. Professionals from e-commerce, tech, and telecom industries should be allowed to transition into banking through fast-track regulatory onboarding and cross-sector fellowships. The banks should be required to submit annual digital capability audits, including staff digital literacy rates, innovation project participation, and internal digital training hours. This would shift HR oversight from administrative compliance to strategic capacity building. The policies can reward banks that promote intrapreneurship and agile experimentation through regulatory sandboxes. Institutions that empower teams to co-design and test digital solutions internally are more likely to succeed in digital transformation. Lastly, diversity and inclusion in digital teams should be promoted. Women, young professionals, and people from underserved regions should be represented in digital innovation roles, supported by quotas in state-owned banks and public funding allocations. A digitally empowered workforce is the cornerstone of a resilient, innovative, and inclusive digital banking future.
5. Policy recommendation for brand image: The public campaigns led by the SBV or industry bodies can spotlight high-performing digital banks, similar to energy-efficiency labeling in appliances. This not only strengthens brand identity but also encourages competition. The policies should encourage community-based digital financial education,

co-branded by banks and regulators. Building digital confidence at the grassroots level will indirectly improve brand equity, especially in rural or digitally hesitant populations. The strategic partnerships with tech startups, universities, and social platforms can help banks extend their brand narrative beyond financial services towards innovation, sustainability, and inclusion. By anchoring brand image to performance, ethics, inclusion, and user-centricity, banks can build durable reputational capital in the digital age.

6. Policy recommendation for financial technology: The interoperability and scalability of digital platforms must be ensured. Government-led development of national payment gateways, shared data lakes, and core banking-as-a-service can reduce duplication and cost while enhancing innovation diffusion. The FinTech investments should be linked with inclusion metrics. Tax incentives or innovation grants can be offered to projects that target marginalized populations, women entrepreneurs, or green finance objectives. The policymakers should support cybersecurity and digital risk management capacity building in banks using FinTech tools. Certification, audits, and simulation programs can mitigate technological risks and ensure sustainable adoption. By shaping FinTech policy around responsibility, interoperability, and inclusion, Vietnam can turn technological potential into equitable performance gains across the digital banking sector. Banks need to upgrade digital infrastructure, increase transaction points, maintain ATMs in the center, travel, optimize application interface according to local characteristics; Develop a digital financial service ecosystem, connect digital banks with payment platforms, fintech, e-commerce with transparent information to improve experience, increase brand recognition and customer satisfaction to increase utility, create convenience for customers in the process of using the service. Enhance information security and safety by applying advanced security technologies, including biometric authentication, data encryption, and AI fraud detection, to ensure transaction safety and improve customer satisfaction and trust.
7. Policy recommendation for bank competitiveness: The government should create performance-linked incentive schemes for banks that meet particular digital innovation and competitiveness thresholds. Examples include grants for banks that launch inclusive FinTech products in rural areas or fast-track approvals for banks that achieve measurable digital efficiency gains. Vietnam's central banking policies can include innovation scorecards as part of risk-based supervision. Banks that lag behind in innovation could be subject to supervisory nudges, while top performers may be given more regulatory flexibility in experimenting with emerging technologies like AI and blockchain. Furthermore, fostering an inter-bank collaborative innovation environment is essential. Regulatory sandboxes should be expanded to allow shared infrastructure testing, e.g., cloud banking platforms, open APIs. This reduces redundant investment and promotes shared learning. Finally, SBV and MoF (Ministry of Finance) should work together to encourage international competitiveness. This can be achieved through digital export credit schemes, regional innovation competitions, and alignment with ASEAN digital banking standards. By treating competitiveness as a structural capability rather than an individual bank attribute, policy can help shape a digital banking sector that is resilient, forward-looking, and regionally competitive.

Limitations and future research: While this study offers valuable insights into the factors driving digital bank competitiveness and performance, several limitations must be acknowledged. First, the research was limited to the Vietnamese context, which may restrict generalizability to other countries with different regulatory or technological environments. Second, the cross-sectional design does not capture temporal changes or long-term effects. Future studies should consider longitudinal data to better understand causal relationships. Third, the data relied on

self-reported responses from bank employees, which may introduce response bias. Incorporating objective performance indicators or customer perspectives could enhance data robustness. Additionally, the model, while comprehensive, excludes variables such as trust, digital literacy, and cybersecurity resilience, which may be relevant in digital banking. Future research could explore cross-country comparisons, sector-specific applications (e.g., fintech, neobanks), or expanded constructs to refine and extend the current model. These efforts would contribute to a deeper, more global understanding of digital banking dynamics.

Although this study provides valuable insights into the factors that influence business success and competitiveness in digital banking, it should be noted that it has a number of limitations.

First, when evaluating customer-centric dimensions like service quality, contentment, and brand image, there may be common-method variance (CMV) and perceptual bias because the data were gathered solely from employees. Even though the components were modified from validated scales, future studies could include advanced CMV controls like marker variables or latent factor techniques to improve robustness and supplement employee-based assessments with data from external stakeholders or customers.

Second, the study's cross-sectional approach only offers a static perspective on the connections among financial success, consumer experience, and digital technologies. In reality, these dynamics develop gradually: continuous customer pleasure is required before noticeable increases in financial indicators appear, and technical investments take time to mature and result in better consumer experiences. A more complex theoretical explanation of the evolution of digital banking would be possible if these time lags and cumulative impacts were captured. Therefore, to track how these interactions change over time, future research should take into account longitudinal or panel data approaches.

Lastly, although the results of this study are contextualized within the Vietnamese context, there is still limited generalizability to other emerging economies. Comparative research conducted in nations like China, Malaysia, Indonesia, or India could enhance the framework's global applicability by highlighting institutional and cultural variations. The model's explanatory reach would also be expanded by adding more factors including cybersecurity resilience, trust, and digital literacy. Resolving these issues would strengthen the theoretical contribution of digital banking research in emerging nations in addition to improving empirical validity.

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Author contributions

The authors made contributions to the development and planning of the study. The authors divided the tasks equally; P.D.V wrote the conception, method, and design, and conducted the data analysis. P.T.T. wrote the critical revisions of the intellectual content and approved the final version.

Disclosure statement

The authors declare that they have no conflicts of interest.

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APPENDIX

Table A1. Research questionnaires

Code	Factors affecting the bank competitiveness and business performance	5-point Likert scale				
		(1)	(2)	(3)	(4)	(5)
SQ1	The bank provides fast and timely services	(1)	(2)	(3)	(4)	(5)
SQ2	Bank staff are always ready to support and answer inquiries	(1)	(2)	(3)	(4)	(5)
SQ3	The bank's digital interface (mobile/web) is user-friendly and easy to use	(1)	(2)	(3)	(4)	(5)
SQ4	The bank's digital services operate stably and with minimal errors	(1)	(2)	(3)	(4)	(5)
BI1	The bank has a professional and modern brand image	(1)	(2)	(3)	(4)	(5)
BI2	You trust the brand of this bank	(1)	(2)	(3)	(4)	(5)
BI3	This bank has a good reputation in the market	(1)	(2)	(3)	(4)	(5)
BI4	The bank's brand reflects innovation and technological advancement	(1)	(2)	(3)	(4)	(5)
CS1	You are satisfied with the overall experience when using the bank's digital services	(1)	(2)	(3)	(4)	(5)
CS2	The bank has met my expectations	(1)	(2)	(3)	(4)	(5)
CS3	You intend to continue using this bank's services in the future	(1)	(2)	(3)	(4)	(5)
CS4	You are willing to recommend this bank to others	(1)	(2)	(3)	(4)	(5)
FT1	The bank applies advanced financial technologies such as AI and Big Data	(1)	(2)	(3)	(4)	(5)
FT2	You can perform most transactions through the bank's digital platforms	(1)	(2)	(3)	(4)	(5)
FT3	The bank's financial services are automated and personalized	(1)	(2)	(3)	(4)	(5)
FT4	The bank regularly updates its technology to enhance the customer experience	(1)	(2)	(3)	(4)	(5)
DHR1	The bank's employees have strong digital technology skills	(1)	(2)	(3)	(4)	(5)
DHR2	The bank regularly trains its staff on digital transformation	(1)	(2)	(3)	(4)	(5)
DHR3	Bank personnel are capable of adapting to new technologies	(1)	(2)	(3)	(4)	(5)
DHR4	The organizational culture supports innovation and digital transformation	(1)	(2)	(3)	(4)	(5)
DT1	The bank has heavily invested in IT infrastructure.	(1)	(2)	(3)	(4)	(5)
DT2	Digital transformation is central to the bank's development strategy.	(1)	(2)	(3)	(4)	(5)
DT3	The bank integrates multiple digital channels for seamless customer service.	(1)	(2)	(3)	(4)	(5)
DT4	Digital services help the bank improve efficiency and customer service	(1)	(2)	(3)	(4)	(5)
BC1	The bank provides superior services compared to its competitors	(1)	(2)	(3)	(4)	(5)
BC2	The bank is quick to innovate and respond to market changes	(1)	(2)	(3)	(4)	(5)
BC3	The bank operates at a more efficient cost than its competitors	(1)	(2)	(3)	(4)	(5)
BP1	The bank has achieved good profit growth over the past three years	(1)	(2)	(3)	(4)	(5)
BP2	The bank has met its annual customer growth targets	(1)	(2)	(3)	(4)	(5)
BP3	The bank's financial indicators (ROA, ROE, NIM) are at positive levels	(1)	(2)	(3)	(4)	(5)
BP4	The bank maintains a strong competitive position in the market	(1)	(2)	(3)	(4)	(5)