THE IMPACT OF DIGITAL TRANSFORMATION, CORPORATE SOCIAL RESPONSIBILITY AND MARKET ORIENTATION ON FIRM PERFORMANCE: EVIDENCE FROM VIETNAMESE COMMERCIAL BANKS

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Abstract: Digital Transformation (DT) has become a critical factor for maintaining competitiveness in the financial sector. However, the interplay between Market Orientation (MO), Corporate Social Responsibility (CSR), DT, and their combined impact on Firm Performance (FP) remains underexplored, particularly in emerging markets such as Vietnam. This study addresses this gap by examining the relationships in Vietnam's financial industry. The structural equation modeling (SEM) approach was applied to analyze 250 valid responses collected from 2,411 commercial bank branches in Southeast Vietnam. Stratified sampling and snowball sampling methods ensured regional representation. The findings reveal that DT directly enhances FP and acts as a key mediator, strengthening the effects of MO and CSR. DT facilitates real-time responsiveness, enhances transparency, and integrates technological advances with market and social strategies. The study highlights the strategic importance of embedding DT into CSR and MO frameworks to optimize efficiency, achieve sustainable development, and create competitive advantages in an increasingly digitized financial sector.

Keywords: CSR, market orientation, digital transformation, firm performance, banking in Vietnam

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1. Introduction

In an era of rapid technological advancement and global integration, Vietnam's banking sector faces increasing pressure to improve operational efficiency and sustainability. As a key pillar of the economy, banks not only provide essential capital but also drive digital transformation across various industries. The adoption of digital technology has advanced significantly, with over 90% of transactions being conducted online and nearly half of customers using electronic payment services by the end of 2023 (State Bank of Vietnam, 2024). The Fourth Industrial Revolution presents both opportunities and challenges, positioning Digital Transformation as a critical requirement for maintaining competitiveness. Although studies highlight DT’s role in optimizing processes and driving business performance, its interplay with Corporate Social Responsibility and Market Orientation remains underexplored. Existing research underscores MO’s focus on market intelligence and strategic responsiveness and CSR’s commitment to ethical and societal goals, yet their combined synergy under DT’s influence has not been comprehensively examined (Kohli, 2017).

This study addresses this gap by exploring how Digital Transformation mediates and amplifies the impact of CSR and market orientation on firm performance. Through a conceptual model based on Resource-Based View and Stakeholder Theory, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to validate hypotheses using data from 250 valid responses gathered from commercial bank branches in Vietnam. By integrating these frameworks, the research offers actionable insights for leveraging DT to enhance both competitive advantage and sustainable development in the rapidly digitizing banking sector.

2. Literature Review

Stakeholder Theory, introduced by Freeman (1984), broadens corporate responsibility beyond shareholders to encompass all stakeholders affected by business activities. This perspective highlights the strategic role of Corporate Social Responsibility in managing stakeholder relationships, thereby fostering customer satisfaction, loyalty, and ultimately, financial performance (Li et al., (2023). CSR initiatives not only enhance ethical and legal compliance, but also strengthen corporate reputation and contribute to long-term competitive advantages through sustainable stakeholder engagement. The Resource-Based View (RBV), proposed by Barney, (1991), underscores the importance of internal resources such as technology, managerial capabilities, and brand equity—in achieving sustainable competitive advantage. The integration of Digital Transformation and Market Orientation (MO) enhances these resources by optimizing operational efficiency, fostering innovation, and improving customer responsiveness (Cheng et al., (2023). These advancements are particularly crucial in highly competitive markets, where differentiation through technology and strategic orientation is key.

CSR, defined as a firm's commitment to balancing economic, legal, ethical, and societal responsibilities (Carroll, 1999), positively influences firm performance by building trust and loyalty among stakeholders. Recent research shows that CSR strengthens brand reputation and financial performance through enhanced stakeholder relationships and ethical practices (Li et al., 2023). MO, which involves generating, disseminating, and responding to market intelligence, significantly improves operational efficiency and competitiveness by aligning organizational strategies with customer needs and market dynamics (Kohli & Jaworski, 1990).

Digital transformation, defined as the integration of digital technologies across all aspects of business operations, drives innovation, operational efficiency, and customer satisfaction (Karimi & Walter, 2015). In banking, Digital transformation plays a transformative role by automating manual operations, streamlining processes, and enhancing fraud detection capabilities through advanced technologies like Artificial Intelligence (AI) and data analytics (Cheng et al., (2023). These technological advancements enable firms to deliver personalized customer experiences, improve decision-making, and maintain competitiveness in a rapidly evolving digital economy.

In Vietnam, rapid industrialization and modernization have positioned Digital transformation as a critical driver of economic progress. The banking and financial sectors have spearheaded this transformation, leveraging mobile banking, e-commerce, and digital payment systems to enhance accessibility and operational efficiency (Pham, 2023; State Bank of Vietnam, 2024). However, challenges such as high investment costs, cybersecurity issues, and inconsistent customer data management hinder the widespread adoption of digital technologies.

Despite these barriers, the synergistic effects of digital transformation, market orientation, and CSR present significant opportunities for enhancing firm performance. Digital transformation acts as a mediator, amplifying the impact of market orientation by enabling real-time responsiveness and aligning customer insights with innovative solutions. Simultaneously, digital transformation optimizes CSR initiatives by improving transparency, automating processes, and fostering stakeholder engagement.

This study addresses a critical research gap by examining how digital transformation mediates the relationship between market orientation, CSR, and firm performance in Vietnam's financial sector. The findings provide actionable insights for leveraging digital transformation as a strategic tool to enhance market responsiveness, stakeholder trust, and sustainable business growth. By integrating MO's market intelligence, CSR's societal commitments and DT's technological advancements, the study offers a comprehensive framework for achieving competitive advantages and driving transformative outcomes in an increasingly digitalized global economy.

3. Hypotheses

3.1 Corporate Social Responsibility Positively Impacts Firm Performance

CSR is recognized as both an ethical obligation and a strategic tool that enhances financial performance and operational efficiency. According to Stakeholder Theory, CSR fosters strong relationships with stakeholders, driving loyalty, reputation and reduced business risks, which directly improve firm performance. Empirical studies, such as Li et al. (2023), demonstrate that companies with robust CSR strategies achieve higher revenue growth and profitability by attracting socially conscious investors and enhancing brand credibility. Additionally, CSR reduces costs linked to legal and ethical risks by ensuring compliance with regulations and societal norms, improving operational efficiency. Research also highlights CSR's role in driving innovation and value creation, as noted by Chernev and Blair (2015), who observed its positive influence on corporate reputation and customer perceptions. Furthermore, CSR enhances internal collaboration and employee motivation, improving productivity and service quality, as emphasized by Weber (2008) and Hsu (2012).

CSR has long been regarded not only as an ethical obligation but also as a strategic tool that delivers financial benefits and sustainable operational efficiency. According to Stakeholder Theory, CSR enables firms to establish strong relationships with stakeholders such as customers, suppliers, and communities. This, in turn, fosters loyalty, enhances reputation, and minimizes business risks factors that directly contribute to improved firm performance.

Empirical studies have demonstrated that CSR enhances financial performance by elevating corporate image and building trust among stakeholders. Li et al., (2023) found that companies with well-defined CSR strategies achieve higher revenue growth and profitability. They attribute this to CSR’s ability to attract socially and environmentally conscious investors while strengthening brand credibility. Additionally, CSR helps companies reduce costs associated with legal and ethical risks. By adhering to regulatory and societal norms, firms can avoid legal complications and improve operational efficiency. Some studies have also highlighted CSR's positive impact on innovation and value creation. For instance, Chernev & Blair, (2015) note that CSR not only enhances corporate reputation but also positively influences customer perceptions of a firm's products and services.

Moreover, CSR serves as a significant driver of performance by fostering internal interaction and collaboration within the organization. As highlighted by Weber, (2008) and Hsu, (2012), CSR motivates employees and strengthens organizational commitment, thereby improving labour productivity and service quality.

Based on these arguments, CSR emerges as not merely an ethical requirement but also a strategic instrument for enhancing firm performance. This forms the basis for proposing hypothesis:

H1: Corporate Social Responsibility positively impacts firm performance.

3.2 Digital Transformation as a Critical Mediator in the Relationship CSR and Firm Performance

According to Stakeholder Theory, CSR enhances brand reputation and strengthens relationships with customers and stakeholders. However, digital transformation optimizes these effects by digitizing processes, increasing transparency, and improving operational efficiency. Studies have shown that firms investing in CSR often adopt digital transformation to enhance interaction capabilities, automate CSR management processes, and leverage digital platforms to increase transparency in CSR activities, such as social responsibility reporting. Digital transformation serves as a crucial mediator in the relationship between CSR and Firm Performance, amplifying the impact of CSR initiatives through process digitalization, increased transparency, and operational efficiency. According to (Cheng et al., 2023), DT enhances CSR outcomes by automating reporting and facilitating stakeholder engagement, thereby improving financial and operational performance. Similarly, (Meng et al., 2022) emphasize that digitalization across value chains enables CSR activities to align more effectively with organizational and societal goals, strengthening their influence on firm performance. Innovation also emerges as a key factor, with (Ruggiero & Cupertino, 2018) highlighting that DT-driven innovation initiatives optimize CSR effectiveness and positively influence financial outcomes. Additionally, Liu & Jung, (2021) argue that digital transformation reinforces CSR authenticity by integrating transparency and traceability, which increases stakeholder trust and enhances performance metrics. In specific sectors like manufacturing and finance, Wang et al., (2022) and Al-Shammari et al., (2022) demonstrate that DT-powered CSR strategies result in cost efficiencies, improved visibility, and enhanced corporate reputation, which collectively contribute to superior firm performance.

The integration of CSR with digital transformation results in reduced operational costs while fostering customer trust and satisfaction, thereby optimizing the relationship between CSR and firm performance. Given these findings, Hypothesis H2 is proposed:

H2: Digital Transformation mediates the relationship between Corporate Social Responsibility and Firm Performance.

3.3 Market Orientation Positive Impact on Firm Performance

Market Orientation is defined as a firm's ability to generate, disseminate and respond to market information, enabling the optimization of business strategies and meeting customer demands (Kohli & Jaworski, 1990). Research has demonstrated that market orientation not only focuses on satisfying current customers but also anticipates future needs, enhancing a firm’s competitiveness and achieving superior performance. (Jaworski & Kohli, 1993) confirm that firms with effective market orientation strategies often achieve higher financial performance through improvements in revenue and profitability. This is further supported by (Chaudhary et al., 2023) who highlight that market orientation, when combined with strategic flexibility, enhances business performance, particularly in less competitive environments. Beyond financial performance, market orientation also fosters innovation. Gotteland et al., (2020) reveal that firms with strong market orientation capabilities are better equipped to develop new products and seize market opportunities, thereby achieve faster growth. Additionally, Lansiluoto et al., (2019) have found that MO-driven firms often implement Performance Measurement Systems (PMS), improving resource management and optimizing operations, which ultimately leads to better financial outcomes.

Apart from financial benefits, Appiah-Nimo & Chovancova, (2020) emphasize that market orientation supports firms in undertaking sustainable activities, meeting customer and societal demands for environmental and social responsibility. Market orientation enables firms to achieve higher performance through internal coordination, swift market responsiveness, and the promotion of innovative and sustainable practices. Based on this foundation, Hypothesis H3 is proposed as follows:

H3: Market Orientation positively impacts firm performance.

3.4 Digital Transformation as a Mediator in the Relationship between Market Orientation and Firm Performance

The pivotal role of digital transformation as a mediator between market orientation and Firm Performance is increasingly substantiated by academic research. Grounded in the RBV theory, organizations with robust market orientation leverage market intelligence to craft strategies and implement digital initiatives, thereby attaining competitive advantages (Barney, 1991). Market orientation facilitates the integration of technology into business operations, enhancing real-time responsiveness to customer needs and market dynamics (Cheng et al., 2023; Kohli & Jaworski, 1990).

As an intermediary, digital transformation significantly boosts organizational performance by automating processes, enhancing productivity and reducing costs (Karimi & Walter, 2015). Moreover, digital transformation fosters operational transparency and fortifies customer relationships in market-oriented firms, yielding improved financial and operational outcomes (Meng et al., 2022). Firms combining DT with MO exhibit superior agility, enabling them to navigate market fluctuations and capitalize on sustainable growth opportunities (Gangi et al., 2019).

Empirical studies reinforce this synergy between MO and DT in driving firm performance. (Abbu & Gopalakrishna, 2021) demonstrate that market orientation enhances internalization and operational processes, which, when amplified by digital transformation, lead to superior financial and customer service outcomes. Similarly, (Yu et al., 2022) highlight DT's mediating role in aligning strategic orientations like market orientation with operational performance, emphasizing the value of integrating market insights with digital innovations. (Joensuu-Salo et al., 2018) confirm that digital tools aligned with market orientation directly improve FP, transforming market data into actionable strategies, particularly within SMEs.

Further supporting evidence comes from (Pan et al., 2021), who have revealed that digital transformation bolsters innovation and new product development within market-driven frameworks. (Rostika, 2023) affirms DT’s mediating role in aligning strategic orientations, including MO, with operational performance, enabling firms to achieve competitive advantages through advanced technologies. Finally, Zhao et al., (2023) have underscored the importance of digital transformation strategies in customer relationship management and process optimization, mediating MO's effects on firm performance, particularly in the financial sector.

These insights collectively highlight the critical role of digital transformation as a bridging mechanism that amplifies the positive impacts of market orientation on firm performance, validating the proposed hypothesis H4 is proposed as follows:

H4: Digital Transformation mediates the relationship between Market Orientation and Firm Performance.

3.5 Digital Transformation and Its Impact on Firm Performance

Digital transformation is defined as the adoption and integration of digital technologies into all aspects of a business to optimize operational processes, enhance decision-making capabilities, and improve overall performance. According to the RBV theory, digital transformation equips firms with the ability to innovate and leverage technology to enhance operational efficiency in a dynamic and highly competitive business environment (Barney, 1991; Prisecaru, 2016). DT facilitates the automation of processes, minimizes errors, and boosts operational efficiency. Karimi & Walter, (2015) emphasize that the integration of digital technologies not only increases productivity, but also enhances data analytics capabilities, enabling firms to make more effective decisions.

Digital technologies, such as Big Data analytics and Artificial Intelligence (AI), empower businesses to better understand customer needs, deliver personalized services and strengthen customer relationships. Gong et al., (2021) highlight that digitalized customer experiences increase customer loyalty and enhance financial performance. Moreover, digital transformation enables firms to adapt swiftly to market changes and seize new growth opportunities. Svahn et al., (2017) underscore that digital transformation facilitates the development of new products and services, thereby driving revenue growth and improving competitive positioning.

Digital transformation serves as a vital factor in enhancing firm performance and optimizing operational effectiveness in competitive markets. Based on the RBV theory, digital transformation leverages internal technological resources to meet dynamic market demands and foster innovation (Barney, 1991). Empirical studies substantiate the impact of DT on firm performance, emphasizing its role in automating processes, improving productivity and reducing operational costs (Karimi & Walter, 2015).

For instance, H. Wang et al., (2022) reveal that digital transformation enhances the performance of Chinese manufacturing firms through low-cost empowerment and innovation mechanisms, demonstrating its strategic value in dynamic industries. Similarly, Wielgos et al., (2021) highlight that digital business capabilities, which encompass digital transformation, significantly influence firm performance across industries by fostering agility and competitive advantage.

Additional evidence from Meng et al., (2022) underscores that digital transformation bolsters transparency and customer relationship management, further enhancing financial and operational performance. In the service sector, Masoud & Basahel, (2023) identify customer experience and IT innovation as key mediators that amplify positive impact of DT on FP.

Furthermore, Yu et al., (2022) demonstrate that digital transformation positively influences firm performance by improving employee efficiency and fostering sustainable growth. This aligns with the findings of Zhao et al., (2023), who indicate that user participation and environmental dynamics augment the contribution of DT to firm performance.

Based on theoretical foundations and empirical evidence, digital transformation emerges not merely as a supporting tool, but also as a critical determinant of firm performance. Thus, the following hypothesis is proposed:

H5: Digital Transformation positively impacts Firm Performance.

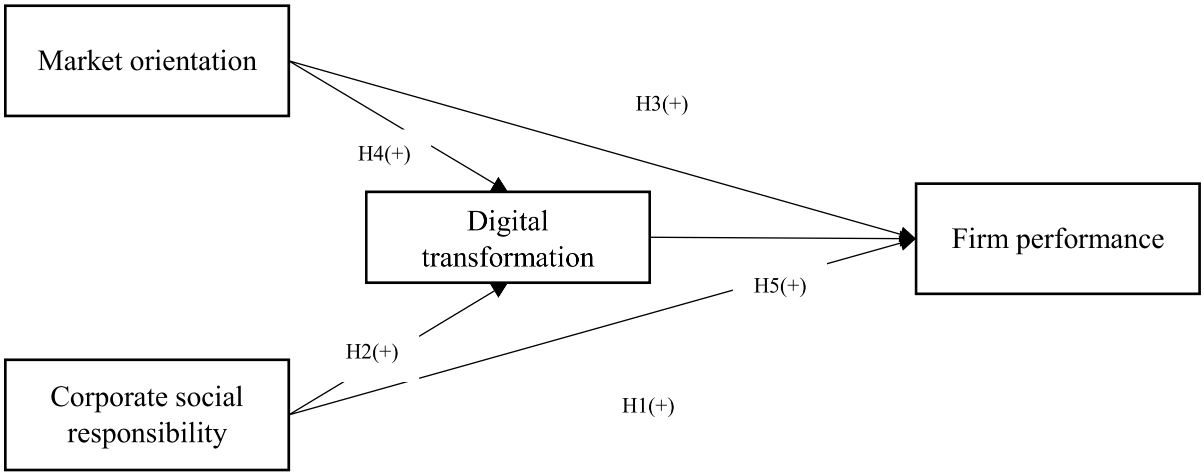

Figure 1. Research Framework

4. Research Methodology

4.1 Sample and data gathering

We conducted a survey targeting Vietnam's banking industry to evaluate the proposed conceptual framework, focusing on banks undergoing digital transformation. The survey covered branches in the Southeast region, including Ho Chi Minh City, Binh Duong, Dong Nai, Tay Ninh, and Ba Ria-Vung Tau provinces. Questionnaires were distributed via email and face-to-face interviews, targeting middle and senior level executives, department heads, and senior employees familiar with their bank's digital transformation and CSR activities. Respondents were required to have at least three years of experience to ensure accurate and unbiased insights. The study population included 2,411 branches of joint-stock commercial banks, with Ho Chi Minh City accounting for over 70%. Using stratified and snowball sampling methods, the final sample comprised 250 respondents (10% of the population), distributed across the provinces to ensure diversity and representativeness. Snowball sampling further enhanced participation by leveraging referrals within the banking network.

4.2 Measurement

The study utilized four scales to measure the key constructs: CSR, Market Orientation, Digital Transformation, and Firm Performance. These measurement scales were adapted from validated international studies and refined through expert interviews to align with the Vietnamese context.

CSR was assessed in four main dimensions: economic, legal, ethical and philanthropic responsibilities. The scale is based on Carroll's model (1991) and has been validated in previous studies in the business and financial sectors.

The market orientation scale encompasses market intelligence generation, dissemination and responsiveness, aligning with the theoretical framework, established by Kohli & Jaworski, (1990). The MARKOR scale was subsequently adapted and refined by Matsuno et al., (2000).

DT was measured through four dimensions adapted from Blixen-Finecke, (2020): (1) Digital Product Experience, evaluating online presence through website functionality and design; (2) E-commerce, assessing the ability to conduct online sales and optimize shopping experiences; (3) e-CRM, measuring customer interaction and retention via digital tools; and (4) Digital Marketing, focusing on branding and customer engagement through online platforms. These dimensions collectively assess the maturity of a firm's digital transformation and its impact on operational performance.

FP was evaluated through three dimensions: (1) Cost-based performance, focusing on profitability after cost deductions, reflecting resource optimization (Jaworski & Kohli, 1993); (2) Revenue-based performance, highlighting sales and revenue outcomes to demonstrate market opportunity utilization (Wu & Cavusgil, 2006); and (3) Global performance, assessed via managerial comparisons to strategic goals and competitors, shaping competitive positioning (Keh et al., 2007). Indicators such as profitability, market share growth, and sales were utilized to comprehensively measure performance in alignment with modern trends (Homburg & Wielgos, 2022; Z. Wang & Kim, 2017).

The present study employed indicators such as profitability, market share growth, and sales outcomes, integrating these with comparisons with the firm's strategic objectives. This subjective approach, supported by extensive market orientation literature, enabled a comprehensive evaluation of performance, aligned with contemporary trends, including digital data measurement (Homburg & Wielgos, 2022; Z. Wang & Kim, 2017). Additionally, we used a five-point Likert scale that ranged from 1 (indicating strong disagreement) to 5 (indicating strong agreement).

4.3 Analytical approach

Structural Equation Modeling (SEM), encompassing covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM), is widely used in data analysis. While CB-SEM has traditionally been favoured, PLS-SEM has become prominent for its ability to handle complex models and small samples (Hair et al., 2021). In 2020, over 1,400 academic studies utilized PLS-SEM, showcasing its rising adoption.

This study applies PLS-SEM to analyze complex models with a small sample size. The analysis validates lower-order measurement models using the Repeated Indicator Approach and higher-order models via the Disjoint Two-Stage Approach, ensuring convergent and discriminant validity. Hypotheses are tested through Bootstrapping with 5,000 iterations, yielding robust results without assuming normal data distribution.

The research framework was developed from a literature review on CSR, market orientation, digital transformation and firm performance. The measurement tool was created in English, translated into Vietnamese, and pre-tested with 15 bank executives in Ho Chi Minh City. Data collection from March to December 2023 produced 250 valid responses from 260 distributed questionnaires.

Table 1.
Respondents' demographic characteristics

Demographics	Category	Frequency	Percentage
Gender	Male	153	61.20%
	Female	97	38.80%
Age group	<25	28	11.20%
	25 - <35	79	31.60%
	35 - <50	113	45.20%
	≥ 50	30	12.00%
Education	PhD/M.Sc	56	22.40%
	Bachelor	182	72.80%
	Diploma	12	4.80%
Monthly salary	< 15 mil VND	22	8.80%
	15 – <30 mil VND	63	25.20%
	30 – <50 mil VND	128	51.20%
	≥ 50 mil VND	39	15.60%
Location of bank	Ho Chi Minh City	180	72.00%
	Binh Duong	22	8.80%
	Binh Phuoc	6	2.40%
	Dong Nai	19	7.60%
	Ba Ria - Vung Tau	16	6.40%
	Tay Ninh	7	2.80%

5. Results

The reliability of the measurement scales was evaluated using internal consistency methods through Cronbach's Alpha and Composite Reliability (CR). A total of 12 scales with 79 observed variables were assessed, and the results revealed Cronbach's Alpha values ranging from 0.799 to 0.925, indicating high reliability according to the standards of (Nunnally & Bernstein, 1994), with an optimal range of 0.7–0.9. No observed variables exhibited item-total correlations below 0.3, confirming that all variables met the necessary reliability requirements for subsequent analysis (Hair et al., 2020). Additionally, the CR values for the lower-order constructs exceeded 0.7, further reinforcing the stability of the scales. The results in Table 2 demonstrate that the measurement scales employed in the study are reliable and suitable for further analysis.

Table 2.
Reliability and validity test

	Cronbach's Alpha	Composite Reliability (CR-rho-C)	Average Variance Extracted (AVE)
DEP	0.853	0.891	0.577
DMK	0.790	0.857	0.545
ECM	0.784	0.853	0.538
ECR	0.901	0.922	0.629
ECRM	0.822	0.867	0.583
EMR	0.885	0.911	0.594
LR	0.914	0.931	0.660
PR	0.908	0.926	0.610
MID	0.731	0.817	0.528
MIG	0.783	0.841	0.599
MRE	0.827	0.869	0.557
FP	0.787	0.854	0.540

** DEP: Digital Product Experience; DMK: Digital Marketing; ECM: e-Commerce; ECRM: e-CRM; MIG: Market Intelligence Generation; MID: Market Intelligence Dissemination; MRE: Market Responsiveness; EMR: Economic Responsibility; LR: Legal Responsibility; ECR: Ethical Responsibility; PR: Philanthropic Responsibility; FP: Firm Performance*

To assess the convergent validity of the measurement scales, the Average Variance Extracted (AVE) must achieve a minimum threshold of 0.5 (Anderson & Gerbing, 1988). The analysis results indicated that the lower-order constructs all had AVE values equal to or greater than 0.5, demonstrating that the higher-order constructs in this study achieved convergent validity.

The discriminant validity of the scales was evaluated using multiple methods, including Cross-loading, the Fornell and Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT). Among these, the Fornell and Larcker criterion, a widely used approach in research, stipulates that the square root of the AVE of a construct must exceed all correlation coefficients between that construct and other constructs in the model (Fornell & Larcker, 1981). The results confirmed that all lower-order constructs satisfied this criterion. Furthermore, analyses of Cross-loading and HTMT also verified that the lower-order constructs in this study achieved discriminant validity, ensuring the reliability and validity of the measurement scales used in the research.

Table 3.
Fornell and Larcker Discriminant Validity Results – Lower-Order Constructs

	DEP	DMK	ECM	ECR	ECRM	EMR	FP	LR	MID	MIG	MRE	PR
DEP	**0.860**											
DMK	0.633	**0.738**										
ECM	0.605	0.617	**0.733**									
ECR	0.372	0.435	0.370	**0.793**								
ECRM	0.559	0.573	0.525	0.250	**0.695**							
EMR	0.422	0.441	0.378	0.616	0.258	**0.77**						
FP	0.458	0.485	0.426	0.597	0.320	0.594	**0.735**					
LR	0.447	0.485	0.387	0.632	0.259	0.644	0.603	**0.813**				
MID	0.272	0.253	0.207	0.283	0.166	0.303	0.397	0.275	**0.654**			
MIG	0.343	0.331	0.276	0.430	0.219	0.448	0.646	0.446	0.543	**0.631**		
MRE	0.320	0.339	0.294	0.439	0.215	0.439	0.601	0.432	0.486	0.546	**0.676**	
PR	0.419	0.472	0.409	0.618	0.257	0.617	0.616	0.834	0.296	0.422	0.417	**0.781**

The results of the quantitative data analysis at the higher-order structural level were developed based on the foundation of lower-order data analysis. This approach aimed to validate and evaluate the higher-order structural model comprising four key constructs: (1) Corporate Social Responsibility (CSR), (2) Market Orientation (MO), (3) Digital Transformation (DT) and (4) Firm Performance (FP). The analysis of outer loadings in Table 4 revealed that all constructs met the required threshold of ≥ 0.7, ensuring validity in accordance with the recommendations of Hair et al., (2020).

The reliability of the higher-order constructs was assessed using two key indicators: Cronbach's alpha and Composite Reliability (CR). According to Nunnally & Bernstein, (1994), values of Cronbach's alpha and CR between

0.7 and 0.9 are considered optimal. The analysis results demonstrated that all higher-order constructs achieved Cronbach's alpha and CR values exceeding 0.7, ensuring reliability. Additionally, the Average Variance Extracted (AVE) for the constructs within the higher-order structure met the threshold of ≥ 0.5, indicating convergent validity. These findings confirm that the higher-order constructs are reliable and appropriate for use in subsequent analyses.

Table 4.
Outer Loadings Results for Higher-Order Constructs

	CSR	DT	FP	MO
DEP		0.927		
DMK		0.937		
ECM		0.910		
ECRM		0.715		
LR	0.941			
EMR	0.932			
PR	0.930			
ECR	0.928			
FP1			0.720	
FP2			0.766	
FP3			0.768	
FP4			0.748	
FP5			0.767	
MID				0.754
MIG				0.917
MRE				0.896

According to Fornell & Larcker, (1981), a construct is considered to have discriminant validity when the square root of its Average Variance Extracted (AVE) exceeds all its correlations with other constructs in the model. The analysis results in this study, as presented in Table 5, indicate that the square root of the AVE values for the constructs ranges from 0.540 to 0.870. This confirms that all constructs in the study satisfy the discriminant validity criterion proposed by Fornell and Larcker, ensuring the independence of the constructs in the model and the validity of subsequent analytical results.

Table 5.
Fornell-Larcker criterion and Reliability and Convergent Validity – Higher-Order Constructs

	CSR	DT	FP	MO	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
CSR	**0.933**				0.950	0.964	0.870
DT	0.473	**0.877**			0.897	0.929	0.769
FP	0.646	0.488	**0.735**		0.787	0.854	0.540
MO	0.494	0.369	0.655	**0.859**	0.821	0.893	0.737

The study evaluated the structural equation model (SEM) using the coefficient of determination (R^2) to measure variable influence, variance inflation factor (VIF) to check for multicollinearity and Bootstrapping for hypothesis testing. All VIF values were below 5, confirming no multicollinearity and validating the reliability of the measurement scales. These findings support the analysis of direct and indirect relationships within the model. Hypotheses were tested using Bootstrapping with 5,000 iterations, allowing for precise evaluation of path coefficients without assuming normal distribution. Hypotheses with P-values below 0.05 were deemed statistically significant (Figure 2).

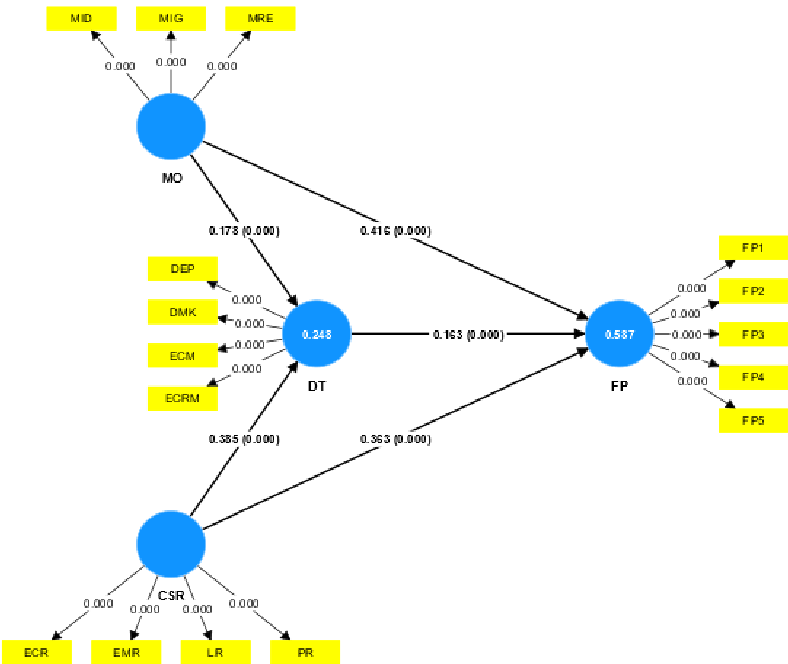

Figure 2. PLS-SEM analysis results of the research framework model

The analysis results indicate that the R^2 values for the dependent variables in the model are significant, demonstrating varying degrees of impact from the independent variables. Specifically, in Table 6, the R^2 value for Digital Transformation (DT) is 24.8% (R^2 = 0.248), and for Firm Performance (FP) - the main dependent variable - is 58.7% (R^2 = 0.587). These values fall within the range of 0 to 1, where values closer to 1 indicate higher explanatory power, aligning with the roles of each factor within the model (Hair et al., 2020).

The study measured the impact of independent variables on dependent variables using standardized path coefficients, with higher coefficients indicating stronger influence. Bootstrapping validated the significance of both direct and indirect effects, confirming the reliability of the hypotheses. Among the direct effects, Market Orientation (MO) had the strongest impact on Firm Performance (FP) (coefficient: 0.416), emphasizing its key role in enhancing efficiency. Corporate Social Responsibility (CSR) also significantly influenced FP (coefficient: 0.363), improving both ethics and performance. Digital Transformation (DT), while showing the weakest direct effect (coefficient: 0.163), still demonstrated its importance in driving business improvement through technology.

Table 6.
Hypothesis results and decision

Hypothesis	Constructs	Original sample (O)	Standard deviation (STDEV)	P values	Supported hypothesis
H1	CSR -> FP	0.363	0.055	0.000	Supported
H2	CSR -> DT -> FP	0.063	0.019	0.001	Supported
H3	MO -> FP	0.416	0.052	0.000	Supported
H4	MO -> DT -> FP	0.029	0.012	0.013	Supported
H5	DT -> FP	0.163	0.044	0.000	Supported
R^2 Digital transformation = 0.248 R^2 Firm performance = 0.587			Q^2 Digital transformation = 0.186 Q^2 Firm performance =0.308		

The findings reveal statistically significant indirect effects (P-values < 0.05), with CSR influencing FP via DT (coefficient: 0.063) and MO impacting FP through DT with a coefficient of 0.029. These results underscore DT's role in enhancing the effectiveness of CSR and market-oriented strategies. The model's predictive ability, confirmed by out-of-sample predictive relevance (Q^2>0), further supports its robustness (Hair et al., 2017).

These results highlight DT's critical mediating role in amplifying the effects of CSR and MO on FP. Firms should focus on CSR initiatives, invest in DT, and integrate these with market-oriented strategies to maximize performance. Prioritizing impactful factors, such as MO, CSR and DT, enables firms to enhance efficiency and secure a sustainable competitive advantage.

6. Discussion

This study investigates the relationships between Market Orientation, Corporate Social Responsibility and Digital Transformation, and their effects on Firm Performance in Southeast Vietnam’s banking sector using structural equation modeling (SEM). The findings reveal that MO is the most significant driver of FP ($\beta = 0.416$), highlighting the importance of customer needs analysis, competition monitoring and internal coordination in boosting revenue and operational efficiency, while acting as strategic guide for effective business strategies amid digital transformation. CSR has a direct impact on FP ($\beta = 0.363$) and an indirect influence through DT ($\beta = 0.063$), with initiatives such as legal compliance and community development enhancing corporate image, fostering customer trust and increasing financial value, further amplified by DT. DT plays a critical mediating role, influencing FP directly ($\beta = 0.163$) and acting as a bridge linking CSR to FP ($\beta = 0.385$) and MO to FP ($\beta = 0.369$), while optimizing processes and performance through technologies such as AI, Big Data and CRM. The integration of MO, CSR, and DT significantly enhances FP, emphasizing the necessity of strategic alignment to achieve sustained competitiveness in an increasingly demanding market. The study underscores the critical interplay between MO, CSR and DT, with DT serving as both an independent driver and a strategic bridge to optimize business performance, offering actionable insights for banks to develop sustainable and competitive strategies in a digitally evolving landscape.

Theoretical implications

The study developed and validated an integrated theoretical model linking Market Orientation, Corporate Social Responsibility and Digital Transformation to enhance Firm Performance, offering a comprehensive framework for synergizing business strategies, social responsibility and technology to improve performance. DT emerged as a vital intermediary, bridging the relationships between CSR, MO and FP, highlighting the strategic importance of digitalization in optimizing processes, enhancing responsiveness and increasing transparency in CSR activities. The measurement scales, tailored to Vietnam's banking sector, also demonstrated broader applicability, with dimensions such as information dissemination (MO), philanthropic responsibility (CSR) and e-commerce (DT), standardized and validated for future research. This study advances corporate management theory, particularly in digital transformation and social responsibility, providing insights for developing countries to align technological integration with sustainable development goals, offering both theoretical and practical contributions.

Practical implications

Banks should prioritize developing robust systems for collecting information from customers, competitors and market trends, using tools such as Big Data analytics and regular customer surveys. Cross-departmental collaboration should be strengthened through training and meetings, and prompt response mechanisms are essential for addressing customer complaints and adapting to market changes to enhance competitiveness and customer experience.

Corporate Social Responsibility must span economic, legal, ethical and philanthropic dimensions. Banks should aim to maximize shareholder value, ensure legal compliance through transparent audits, uphold ethical practices to foster customer loyalty and engage in community-building initiatives, such as supporting underprivileged groups.

Digital transformation is crucial for boosting operational efficiency and customer satisfaction. Banks should invest in digital marketing, optimize mobile platforms and strengthen e-commerce and CRM systems to reduce costs and enhance convenience, fostering long-term customer relationships.

The integration of Market Orientation, CSR and Digital Transformation is key to achieving sustainable growth. MO helps identify CSR activities and supports accurate forecasting of customer needs, while DT optimizes CSR processes and enhances transparency. Seamless integration of these elements improves performance and builds lasting trust with customers and communities.

To succeed, banks should foster a collaborative culture, train employees on integrating MO, CSR and DT, and use Key Performance Indicators (KPIs) to measure success across financial performance, customer satisfaction and social impact, enabling continuous strategy refinement in a competitive environment.

Limitations and Scope for future research.

Future research should broaden its scope to include other regions in Vietnam or neighbouring Southeast Asian countries, enhancing generalizability and enabling comparisons across regions, countries and industries. Incorporating qualitative methods such as in-depth interviews or focus groups would provide richer insights into the complex relationships among Market Orientation, Corporate Social Responsibility and Digital Transformation, supporting the interpretation of quantitative findings and generating new, practical hypotheses.

Future studies should also consider external factors such as government policies, global economic trends or societal disruptions, which could reshape the dynamics between MO, CSR, DT and Firm Performance. Additional variables, including leadership capabilities, organizational culture and innovation, may further enrich theoretical and practical insights, acting as moderators or amplifiers of these relationships.

Longitudinal studies are crucial for understanding the evolution of these interactions over time in dynamic economic, technological and societal contexts. Advanced analytical tools like AI, machine learning and big data analytics can uncover hidden relationships and enhance the precision of analyses, clarifying the roles of MO, CSR, and DT in improving FP.

These directions not only expand the academic value of future research, but also offer actionable guidance for businesses to develop sustainable and effective strategies by integrating innovative variables, methodologies and real-world contexts.

7. Conclusion

This study provides valuable insights into the interconnected roles of Market Orientation, Corporate Social Responsibility and Digital Transformation in driving Firm Performance in Vietnam’s banking sector. The findings highlight that market orientation serves as the most significant driver of firm performance by enhancing customer intelligence, competitive awareness and internal coordination. CSR contributes to firm performance both directly and indirectly through digital transformation, reinforcing corporate reputation, customer trust and long-term financial value.

Meanwhile, DT acts as both a standalone performance enhancer and a crucial mediator, optimizing operational processes and amplifying the impact of market orientation and CSR through digital solutions such as AI, Big Data and CRM. The integration of these three elements is critical for achieving sustained competitiveness in a rapidly evolving financial landscape.

Beyond Vietnam, these insights hold relevance for other emerging markets facing similar challenges in digital transformation and sustainable business practices. In Southeast Asia, where financial services are expanding rapidly, banks can leverage market orientation and CSR strategies supported by digital transformation to enhance operational efficiency and customer engagement. Similarly, in developing economies with growing fintech ecosystems, integrating digital technologies with market-driven and socially responsible strategies can foster financial inclusion and business resilience. Policymakers and financial institutions in these regions can apply the study's findings to develop frameworks that align digital transformation with market orientation and corporate responsibility, ensuring both competitive advantage and sustainable growth. Future research could explore cross-market comparisons to validate these relationships and refine digital strategies for diverse economic contexts.

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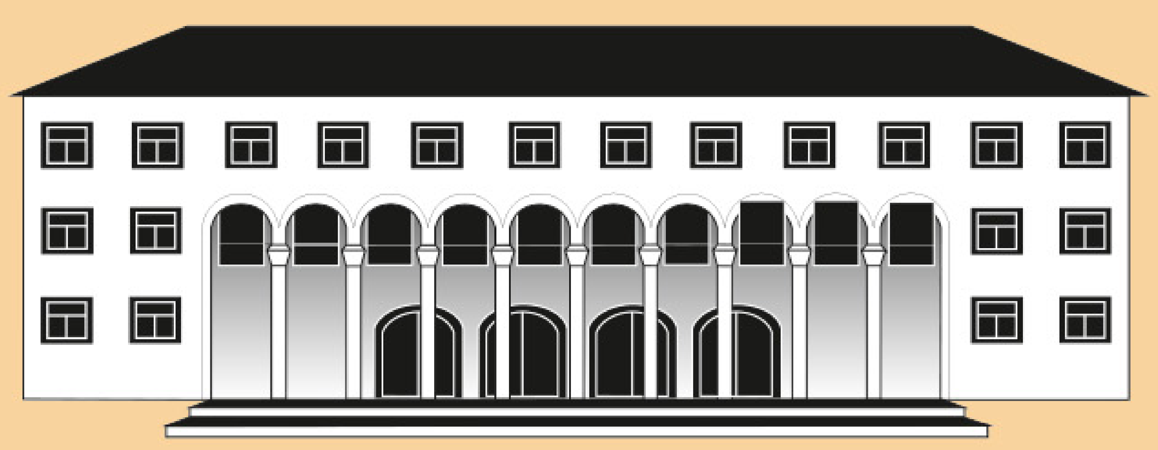

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