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DO NAM HUNG

**BUSINESS PERFORMANCE
OF THE VIETNAM BANK FOR AGRICULTURE
AND RURAL DEVELOPMENT
DURING THE DIGITAL TRANSFORMATION PHASE**

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SUMMARY OF DOCTORAL THESIS

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INTRODUCTION

1. The urgency of the research topic

In the context of the booming Fourth Industrial Revolution (Industry 4.0), digital transformation has become a vital driving force, determining the competitiveness and long-term survival of the global financial and banking system. In Vietnam, Decision No. 810/QĐ-NHNN of 2021 by the Governor of the State Bank of Vietnam officially approved the Digital Transformation Plan for the Banking Sector, positioning it as a strategic breakthrough. Simultaneously, the emergence of stringent security regulations, such as Decision 2345/QĐ-NHNN of 2023 mandating biometric authentication for high-value transactions starting in July 2024, has presented a challenge in balancing technology investment costs and optimizing operational efficiency.

For the Vietnam Bank for Agriculture and Rural Development (Agribank) – a 100% state-owned financial institution playing a leading role in serving agricultural and rural development ("Three Rural Issues") – this problem becomes even more complex due to a profound strategic paradox: on the one hand, it must maintain a vast physical network covering remote areas and islands to fulfill its national inclusive finance mission; on the other hand, it must accelerate the digitalization process to reduce the burden of fixed costs and cumbersome manual labor costs. Furthermore, the agricultural customer base often faces significant barriers in digital skills, requiring solutions that are both modern and simple. Theoretically, the relationship between digital transformation and business efficiency remains a subject of debate, with the "productivity paradox" where large investments in technology can lead to a short-term decline in net profit. In Vietnam, there are not many large-scale empirical studies combining both quantitative data and case studies at a specific institution like Agribank. Therefore, conducting this research is

extremely urgent from both an academic and practical management perspective.

2. Research purpose and objectives

Research objective: To propose a scientific, synchronized, and feasible system of solutions to improve business efficiency for Agribank during the digital transformation period, based on empirical evidence at Agribank itself and macroeconomic trends affecting the entire commercial banking system in Vietnam.

Specific objectives:

- Systematizing the theoretical basis of commercial bank business performance during the digital transformation period from the perspective of economic theory.

- Analyze and evaluate the current state of financial and non-financial business performance of Agribank during the period 2020-2024 under the impact of the digitalization process.

- To build a robust econometric model based on panel data from a sample of 42 Vietnamese commercial banks in order to quantify the direction and extent of the impact of factors representing digital transformation.

- Propose practical solutions based on empirical results and recommend specific policy mechanisms to the Government and the State Bank of Vietnam.

3. Scope of the thesis

Research subject: Business performance (including financial and operational performance) of Agribank and the empirical impact relationship between factors representing digital transformation and the business performance of Vietnamese commercial banks.

Scope of research:

- Regarding content: Focus on analyzing core financial indicators (ROA, ROE, NIM, CIR, NPL) and 6 variables representing digital transformation (CASA, labor productivity, total fixed assets, branch size, workforce size, liquid assets).

- In terms of scope: The study is a case study at Agribank and empirical verification is performed on a sample of 42 commercial banks currently operating in Vietnam.

- Regarding timeframe: Current situation data and regression table data for a 5-year period from 2020 to the end of 2024; proposed solutions and vision extending to 2030.

4. Scientific and practical significance:

This thesis employs a combination of qualitative and quantitative research methods:

- Qualitative research: Content analysis method to systematize theory; case study method based on the successful case study of Sberbank (Russian Federation) in building technological sovereignty.

- Quantitative research: A balanced panel data multivariate regression model was established, consisting of 42 commercial banks with 210 observations. A rigorous scientific validation process was implemented: using the F-test and Hausman test to establish the optimal Random Effects Model (REM); diagnosing heteroskedasticity using the Breusch-Pagan LM test and first-order autocorrelation using the Wooldridge test; applying the Adjusted Standard Errors for Panel Data (PCSEs) estimation method of Beck and Katz (1995) to thoroughly address defects and ensure the BLUE condition.

5. New aspects of the thesis

Scientific significance: Systematizing and developing the concept of multidimensional business performance of commercial banks in the digital age, combining financial and non-financial values. Clearly deciphering the

transmission mechanism and representativeness of digital transformation of financial and non-financial variables on the balance sheet.

Practical significance: To clarify the current situation and the breakthrough in efficiency of Agribank during the 2020-2024 period. To propose a streamlined "Physical" operating model for the physical network combined with the development of Agribank Digital automated kiosks and the Agribank Plus super app; to propose a specific macroeconomic mechanism system (Digital agricultural credit sandbox, Open API for agriculture, privileged rural public services) to be submitted to the State Bank of Vietnam and the Government.

CHAPTER 1: THEORY OF COMMERCIAL BANK BUSINESS EFFICIENCY DURING THE DIGITAL TRANSFORMATION PERIOD

Chapter 1 establishes a solid theoretical foundation on the shift in operating models and performance measurement of commercial banks in the digital age. Under the impact of the Fourth Industrial Revolution, commercial banks are no longer simply traditional financial intermediaries based on closed-loop physical distribution channels, but are transforming into an open-platform digital financial ecosystem. The digital transformation process evolves continuously through three levels: information digitization, process digitization, and comprehensive digital transformation to create a new value model based on data assets.

This thesis asserts that business performance in the digital transformation phase is a multidimensional concept, reflecting the bank's ability to utilize technological resources to restructure and optimize the remaining three core resources: Capital, Labor, and Asset Infrastructure. In this new context, traditional financial performance (ROA, ROE, NIM, CIR) must closely align with non-financial performance (customer satisfaction, digital workforce productivity, innovation capacity). Digital technology acts as a "buffer" to eliminate information asymmetry (according to Akerlof's theory, 1970, and Stiglitz & Weiss's theory, 1981), thereby supporting credit screening, proactive bad debt risk management, and retaining sustainable CASA (Current Account Savings Account) through superior digital experiences.

In particular, this chapter delves into the case study of Sberbank (Russia) – the largest state-owned financial institution in the Russian Federation, which shares many similarities with Agribank in terms of ownership structure and its vast physical network. Sberbank's record-breaking profit surge after sanctions and the SWIFT disconnection in 2022, thanks to

its strategy of completely self-managing its Core Banking system ("Make by Sber", SberTech) and its SberCloud cloud computing infrastructure, has provided invaluable lessons for Agribank regarding the importance of building "technological sovereignty" to ensure system security and continuous operation amidst global geopolitical fluctuations.

CHAPTER 2: ASSESSMENT OF AGRIBANK'S BUSINESS PERFORMANCE DURING THE DIGITAL TRANSFORMATION PERIOD

2.1. Assessment of the financial and non-financial situation at Agribank (2020-2024)

Research on the current situation indicates that Agribank has achieved an impressive growth cycle and made a strong breakthrough in efficiency during the mid-cycle phase, thanks to the thorough application of digital technology:

- Return on assets (ROA) improved significantly from 0.70% (2020) to remain firmly above 1% in the years 2022-2024 (reaching 1.03% in 2024).

- The return on equity (ROE) maintained high performance, peaking at 22.12% (2022) and stabilizing at 19.66% (2024). The slight decline in 2024 was a natural consequence of increasing the charter capital to VND 51,639 billion to strengthen the capital adequacy ratio (CAR) as approved by the National Assembly and the Government.

- The cost-to-income ratio (CIR) – the biggest highlight – decreased sharply from 44.99% (2020) to 37.30% (2024), thanks to process automation through the IPCAS II core system and the Agribank Payment Hub (processing a record of over 56 million transactions/day).

- Demand deposits (CASA) experienced substantial growth, reaching a record 12.85% in 2024 (compared to 10.72% in 2020), supported by the Agribank Plus super app (with over 16 million digital service customers) and the eKYC identification solution, helping to maintain a stable net interest margin (NIM) of 3.1% - 3.5%.

- Labor productivity, calculated as after-tax profit per employee, increased 1.93 times, from VND 269.64 million (2020) to VND 521.96

million (2024) thanks to employees quickly adapting to the digital environment.

– The massive physical network (2,222 points) is trending towards streamlining its depth, gradually replacing inefficient branch offices with the Agribank Digital smart automated kiosk model using facial and fingerprint biometric technology.

However, asset quality revealed significant pressure as the consolidated non-performing loan (NPL) ratio surged to 4.38% at the end of 2024, reflecting the potential risk of loan reclassification after the debt restructuring circulars (Circulars 01, 03, and 14) expired.

Index (%)	2020	2021	2022	2023	2024
ROA	0.70	0.76	1.01	1.05	1.03
ROE	14.79	16.52	22.12	21.91	19.66
CIR	44.99	40,12	36.15	40.71	37.30
NPL	1.78	1.59	1.81	2.26	4.38
NIM	3.0	2.9	3.5	3.3	3.5

2.2. Econometric regression results and hypothesis testing

The empirical quantitative model was run on STATA 17 software with a balance sheet dataset of 42 commercial banks in Vietnam from 2020-2024 (210 observations). After performing the Hausman test ($\chi^2 = 3.41$, $P\text{-value} = 0.3328 > 0.05$) to establish that the Random Effects Model (REM) was more optimal than FEM and Pooled OLS, the author diagnosed model defects and found the existence of both heteroskedasticity (Breusch-Pagan LM, $\chi^2 = 31.84$, $p = 0.0000$) and first-order autocorrelation (Wooldridge test, $F = 14.050$, $p = 0.0005$). The Standard Errors Adjusted for Panel Data (PCSEs) method according to Beck and Katz (1995) was applied to eliminate the above defects, yielding robust regression coefficients that meet the BLUE criterion.

The final empirical regression equation achieved a coefficient of determination $R^2 = 95.05\%$ and a Wald test $\chi^2 = 9804.24$ ($p = 0.0000$):

$$\begin{aligned}\widehat{ROA}_{it} = & 0.2023 - (4.20 \times 10^{-9})\text{TotalLiquidAsset}_{it} \\ & - (1.07 \times 10^{-7})\text{TotalFixedAsset}_{it} + 0.3186\text{CASA}_{it} \\ & + 0.0000933\text{NumberofEmployees}_{it} \\ & + 0.002346\text{Labourproductivity}_{it} \\ & - 0.0005214\text{NumberofBranches}_{it}\end{aligned}$$

All six research variables achieved the highest statistical significance level of 1% ($p < 0.01$), accepting all the hypothetical assumptions:

1. CASA ratio ($\beta = 0.3186$, $p = 0.004$): This has the strongest positive impact on ROA, reflecting the enormous economic value of low-cost capital attracted from the smooth digital transaction infrastructure and ecosystem connectivity of the Agribank Plus super app.

2. Labor productivity ($\beta = 0.002346$, $p = 0.000$): The second strongest positive impact demonstrates that the quality of the digital workforce is a key lever for boosting overall profitability and minimizing the CIR ratio.

3. Staff size ($\beta = 0.0000933$, $p = 0.000$): The positive impact is small, reflecting reasonable staff expansion to support high-performing technology business segments.

4. Liquid assets ($\beta = -4.20\text{e-}09$, $p = 0.000$): Inverse impact, reflecting the fundamental trade-off between defensive liquidity, safety and asset profitability.

5. Fixed Assets ($\beta = -1.07\text{e-}07$, $p = 0.000$) and Number of Branches ($\beta = -0.0005214$, $p = 0.000$): Both variables representing traditional physical infrastructure maintain a very deep negative impact on ROA. This scientifically demonstrates that the burden of fixed costs, depreciation, and cumbersome operations of a traditional branch network is an eroding barrier

to business efficiency as customer transaction behavior has shifted significantly to the online space.

CHAPTER 3: SOLUTIONS TO IMPROVE AGRIBANK'S BUSINESS EFFICIENCY DURING THE DIGITAL TRANSFORMATION PERIOD

Adhering closely to the development orientation of the banking sector until 2030 according to Decision No. 986/QĐ-TTg and Decision No. 810/QĐ-NHNN, and closely integrating with the ESG Action Plan for the period 2024-2030 (towards Net Zero by 2050 and green credit growth), and the results of empirical research at 42 commercial banks, including Agribank, this thesis proposes a system of 4 groups of practical solutions for Agribank and specific macroeconomic recommendations to the Government and the State Bank of Vietnam:

3.1. A system of four practical solutions for Agribank:

Firstly, optimize the operating model according to the Physical strategy. Gradually streamline and merge inefficient traditional branches to control the negative impact of TFA and NB. Replace them with the widespread adoption of the Agribank Digital smart automated kiosk model integrated with eKYC biometrics, drastically lowering the CIR rate while maintaining financial service coverage in rural areas.

Secondly, we need to enhance digital labor productivity. This involves shifting training methods to an e-learning ecosystem to upgrade the digital skills of nearly 40,000 employees; establishing an advanced reward and salary mechanism based on actual performance (KPIs) to foster innovation and optimize the β coefficient of labor productivity to 0.002346.

Third, increase the CASA ratio and optimize the Net Interest Margin (NIM). Complete the Agribank Plus super app into a multi-utility open financial ecosystem (Open API) to retain idle cash flow. Operate the Funds Transfer Pricing (FTP) mechanism synchronously and thoroughly to separate

risks and accurately measure profit contributions, thereby creating room for setting competitive lending prices and expanding the NIM.

Fourth, modernize credit risk management using data. Apply Artificial Intelligence (AI) and Big Data to upgrade automated credit scoring systems and early warning systems (EWS), eliminate information asymmetry, and control non-performing loan (NPL) risks. Simultaneously, strengthen the recovery and handling of off-balance sheet debt to generate extraordinary income that directly reverses provisions, thereby boosting ROA.

3.2. System for proposing specific macroeconomic policy mechanisms:

Firstly, regarding the State Bank of Vietnam: Support Agribank in quickly completing the legal procedures for increasing its charter capital and the equitization roadmap to expand its market capital mobilization opportunities; promptly issue a legal framework for testing the Sandbox and specific regulations on data security for expanded digital banking products.

Secondly, for the Government: Propose the issuance of 4 specific mechanisms commensurate with Agribank's mission in agriculture, rural areas, and farmers: (i) Granting exclusive pilot privileges for the ecosystem of payment for public services and social security payments in rural areas through Agribank Plus and Loc Viet cards; (ii) Allowing the operation of a specific Sandbox mechanism for granting digital agricultural credit without collateral based on direct connection with national population data (Project 06); (iii) Prioritizing the connection and exploitation of the agricultural sector's data warehouse (Ministry of Agriculture and Rural Development) to assess green credit and manage ESG risks; (iv) Allowing the application of a specific financial mechanism to allocate a higher percentage of pre-tax profits to establish a specific R&D science and technology development fund to compensate for digital experimentation risks.

CONCLUSION

The dissertation "Business Efficiency of the Vietnam Bank for Agriculture and Rural Development in the Digital Transformation Period" has comprehensively achieved its stated scientific objectives. The work has convincingly and empirically demonstrated that in the digital age, the business efficiency of commercial banks has evolved into a multidimensional category, requiring synchronized coordination between financial optimization and enhancement of non-financial operational efficiency. All the empirical findings and the Physical solution system, combined with the specific mechanisms proposed to the Government and the State Bank of Vietnam, are contributions of both high academic value and immense practical value, providing strong support for Agribank to successfully fulfill its unique socio-political mission of serving agriculture, farmers, and rural areas, and achieving sustainable development in the upcoming period of intense international financial integration.

**THE AUTHOR'S SCIENTIFIC WORKS
RELATED TO THE THESIS TOPIC**

No	Project name	Author or co-author	Place of publication	Year of publication
1.	Factors impact on business performance of enterprises the case of Vietnam	Co-author (5)	Journal Of Organizational Behavior Research ISSN: 2528-9705 Vol.: 8, Is.: 2, Year: 2023, Pages: 27-39 DOI: https://doi.org/10.51847/2itmiM3CoE	2023
2.	Solutions to promote digital transformation in Vietnamese logistics businesses.	Co-author (3)	Journal of Financial and Accounting Research Issue 2, January (number 280) - 2025, 61-65	2025
3.	The business performance of the Bank for Agriculture and Rural development based on financial indicators from 2018 to 2023	Main author (2)	Journal of Finance & Accounting Research No.04 (35) 2025 pp. 65-69 https://tapchitckt.hvtc.edu.vn/tabid/1631/baibao/1713/title/the-business-performance-of-the-bank-for-agriculture-and-rural-development-based-on-financial-indicators-from-2018-to-2023/Default.aspx https://doi.org/10.71374/jfar.v25.i4.14	August 2025
4.	Agribank and non-financial business performance indicators	Main author (1)	Journal of Finance & Accounting Research No. 06 (37) – 2025 pp. 122-125 https://doi.org/10.71374/jfar.v25.i6.24	December 2025
5.	Establishing a set of theoretical criteria to build a dynamic competitive structure model for enterprises in the financial market	Co-author (5)	<i>Risk Governance and Control: Financial Markets & Institutions</i> , 16 (2), 144–154. https://doi.org/10.22495/rgcv16i2p13 ISSN - 2077-429X (print) ISSN - 2077-4303 (online)	June 16, 2026