Journal of accounting, management, economics, and business digital banking and bank performance

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Abstract: *Purpose - This study examines how digital banking influences the financial performance of commercial banks. The paper focuses on how digital banking affects profitability, cost efficiency, operational efficiency, customer growth, non-interest income, competitiveness, and selected risk dimensions. As mobile banking, internet banking, digital payments, analytics, and automated service platforms become central to banking strategy, the key issue is no longer whether digital banking matters, but under what conditions it creates measurable financial value. Methodology - The study adopts a comparative analytical desk-review design. Recent peer-reviewed studies and institutional reports on commercial banks, digital transformation, and bank performance were reviewed and interpreted through a common indicator framework. The analysis synthesizes findings on return on assets, return on equity, cost-to-income ratio, fee-based income, customer growth, and digital risk to explain both convergent and divergent outcomes. Findings - The evidence indicates a broadly positive but conditional relationship between digital banking and commercial bank performance. The strongest and most consistent gains appear in cost efficiency, operating productivity, customer reach, and revenue diversification. Profitability gains are real but often delayed by high up-front investment, legacy-system complexity, cybersecurity spending, and uneven customer migration. Banks obtain the best outcomes when digital banking is combined with process redesign, data-enabled sales, governance discipline, and active risk management. Novelty - The article integrates recent evidence into a performance-channel framework that links digital banking to bank profitability through cost, revenue, customer, and resilience mechanisms rather than treating digitalization as a simple technology variable. Significance - The study is useful for bank managers, researchers, and regulators who need to evaluate whether digital transformation produces sustainable financial value in commercial banking.*

Keywords: *bank competitiveness, commercial banks, cost efficiency, digital banking, financial performance, non-interest income, operational efficiency, profitability*

1. Introduction

Digital banking has become one of the most important changes in the structure of modern commercial banking. What used to be just a way to ask questions about accounts, make payments, and send money has now become a bigger redesign of the way banks work. Mobile apps, online banking, cloud-based workflows, digital onboarding, analytics, and application programming interfaces are all things that banks use to get new customers, provide services, keep costs down, manage risks, and compete in financial markets. In this way, digital banking is more than just a nice-to-have feature. It is increasingly a strategic

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operating model that changes the economics of banking itself (Pazarbasioglu et al., 2020; Feyen et al., 2021; Deloitte, 2024).

This change is very important for the company's finances. Digital channels can lower costs by making branches less important, lowering the cost of processing transactions, shortening service times, and improving standardization. On the revenue side, they can reach more customers, keep them longer, personalize their experience, and support fee-based income through payments, cards, insurance distribution, merchant services, and partnerships with embedded finance companies. Recent studies have shown that digital transformation is linked to higher profits or efficiency in commercial banking. However, the relationship is often not linear and doesn't happen right away (Xiang & Jiang, 2023; Citterio et al., 2024; Ren et al., 2024; Ayadi et al., 2025; Zhu & Jin, 2025).

So, the research question isn't whether digital banking is important in theory, but when it actually helps commercial banks make more money. Some banks turn digital investments into lower cost-to-income ratios, faster customer growth, better operational efficiency, and more non-interest income. Others experience mixed or delayed returns because legacy systems, weak customer activation, fragmented governance, or cyber-resilience costs erode the expected gains. The European Central Bank has noted that digital banks may still remain less profitable than traditional banks on median measures because of high fixed costs, funding structure, and narrow business models, even while digitalization reshapes competition across the sector (European Central Bank, 2025).

This issue is important for at least three reasons. First, commercial banks are still very important for credit allocation, payments, and financial stability, so how well they do has a big effect on the economy as a whole. Second, digital challengers and fintech firms are intensifying competition for profitable fee pools and customer relationships. Third, investors and regulators increasingly expect banks to demonstrate that technology investment improves both resilience and financial results rather than simply increasing operating expense. The International Monetary Fund has also pointed out that cyber risk is becoming a bigger macrofinancial problem in a financial system that is becoming more digital (International Monetary Fund, 2024).

This article examines the influence of digital banking on the financial performance of commercial banks via a systematic analytical review of contemporary academic and institutional evidence. It addresses three questions : through which channels does digital banking affect profitability and broader performance; why do outcomes differ across banks and business models; and what strategic implications follow for managers and regulators? The article follows the manuscript template of the target journal. After this introduction, the methods section explains the desk-review design and analytical framework. The next part shows the results and discussion, which cover how they affect profits, costs, operations, customer growth, competition, and risk. The last part restates the main point: that digital banking works better when strategy, investment quality, governance, customer adoption, and risk management all get better at the same time.

2. Methods

This study uses a comparative analytical desk-review design. The choice of method follows the nature of the research question. The objective is to interpret how digital banking influences commercial bank performance across different institutional settings rather than

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to estimate a single-country causal coefficient. Review-based designs are especially useful when the literature is dispersed across countries, when empirical proxies for digitalization differ across studies, and when the relationship being examined operates through multiple channels rather than one direct mechanism (Felipe et al., 2025; Zhu & Jin, 2025).

The evidence base combines peer-reviewed journal articles and institutional reports published mainly between 2020 and 2025. Academic studies were prioritized when they directly examined digital banking, fintech adoption, digital transformation, or digital finance infrastructure in relation to profitability, efficiency, customer outcomes, or risk in commercial banking. Institutional sources were used to contextualize competition, digital maturity, cyber resilience, and the business-model economics of digital banking (International Monetary Fund, 2024; European Central Bank, 2025; McKinsey & Company, 2025). The review does not aim at statistical meta-analysis because the literature uses heterogeneous measures of digitalization, including digital transaction intensity, app usage, online-banking penetration, secure-server proxies, text-based transformation indices, and institution-specific digital maturity metrics.

The analytical logic proceeded in four steps. First, the study identified the main performance indicators repeatedly used in the literature, especially return on assets (ROA), return on equity (ROE), cost-to-income ratio, profit efficiency, fee-based income, customer acquisition, and operational efficiency. Second, the reviewed studies were coded by transmission channel: profitability and revenue, cost and operational efficiency, customer reach and competitiveness, and risk or resilience. Third, the findings were compared across bank types, market contexts, and strategic conditions. Fourth, convergent and divergent results were synthesized into an explanatory narrative suited to the journal format.

Because digital banking often affects intermediate processes before aggregate accounting ratios fully respond, the study evaluates performance using a broad indicator framework rather than a single metric. This is important because banks may improve service speed, lower unit transaction costs, or increase digital usage well before those changes appear clearly in ROA or ROE. The desk-review method therefore emphasizes timing, mechanism, and context, not merely direction of effect.

2.1. Data and indicator framework

Table 1.

Data and indicator framework used in the study

Dimension	Typical indicators	Interpretive focus	Expected relevance
Digital banking intensity	Mobile/online use; digital transaction share; app intensity	Degree of customer-channel and organizational digitalization	Higher reach, lower servicing cost, stronger data capture
Profitability	ROA; ROE; profit efficiency	Ability of assets and equity to generate returns	Usually positive in the medium term

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Cost efficiency	Cost-to-income ratio; overhead ratio	Whether digital channels lower average service cost	Strong positive effect if migration is real
Revenue diversification	Fee income; non-interest income share	Expansion beyond spread-based income	Positive where payment and platform services deepen
Operational efficiency	Turnaround time; automation; resolution speed	Productivity and workflow simplification	Often improves before accounting profitability
Customer growth	Active users; retention; products per customer	Commercial traction and franchise strength	Positive where trust and usability are strong
Risk and resilience	Cyber incidents; fraud losses; downtime	Sustainability of digital growth	Mixed without strong controls

Table 1 indicates that the financial effect of digital banking should not be assessed by a single ratio. Efficiency, customer migration, and non-interest income often improve before ROA and ROE fully respond.

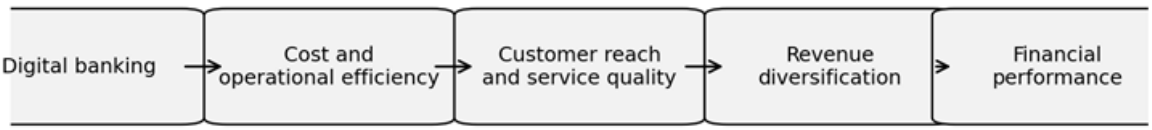


Figure 1. Analytical lens linking digital banking to commercial bank financial performance

3. Results and Discussion

3.1. Results

The reviewed evidence points to a broadly positive but conditional relationship between digital banking and the financial performance of commercial banks. Across the literature, cost efficiency is the most consistent positive outcome, while profitability measures such as ROA and ROE show stronger variation across time and institutions. This pattern makes both theoretical and empirical sense. Banks usually realize direct savings from digitizing transactions, documentation, payments, and service delivery earlier than they realize full profitability gains, because profitability depends on investment timing, funding structure, asset quality, and the speed with which customers migrate to lower-cost channels (Doran et al., 2022; Ren et al., 2024; Ayadi et al., 2025).

Recent studies also show that digital banking should be understood as a performance architecture rather than a single technology variable. When banks only digitize the customer interface, the financial effect may remain limited. When they redesign back-office processes, integrate data systems, automate routine work, and connect digital channels to cross-selling and pricing logic, the performance effect becomes broader and more durable (Citterio et al.,

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2024; Felipe et al., 2025). The literature therefore supports a capability-based view: digital investments create financial value when they are absorbed into the operating model.

Results on profitability and revenue generation are encouraging but nuanced. Ren et al. (2024) find that digital transformation increases bank profit efficiency through both higher revenue and lower cost. Citterio et al. (2024) report that digital transformation is associated with higher profitability among EU-27 banks, with IT and network efficiency acting as important drivers. Zhu and Jin (2025) likewise find a positive impact of bank digital transformation on the financial performance of commercial banks, with efficiency and operational capability acting as mediating channels. These findings suggest that digital banking can improve profitability not only through cost reduction but also through better customer economics, deeper digital engagement, and more diversified income streams.

At the same time, the relationship is often nonlinear. Xiang and Jiang (2023) identify a U-shaped effect of digitalization on commercial bank performance, meaning that early investment and adjustment costs may inhibit results before later benefits emerge. Ayadi et al. (2025) similarly identify nonlinearities in the efficiency relationship. Such findings explain why some banks report mixed short-term financial outcomes despite high digital activity. Up-front spending on core-system modernization, cybersecurity, compliance adaptation, retraining, and platform integration can temporarily suppress visible gains. In effect, digital banking often follows a J-curve in which performance improves after the bank moves beyond adoption toward process integration and monetization.

Cost reduction and operational efficiency remain the strongest and most recurrent gains. Digital channels lower the average cost of routine transactions, especially when customers complete tasks through self-service rather than branch assistance. Automation can reduce paperwork, accelerate approvals, improve consistency, and lower error rates. These process improvements matter because they allow banks to handle larger volumes without proportionate increases in staff or branch expense. Zhu and Jin (2023a, 2023b) show that digital transformation improves operational capability and efficiency, while Doran et al. (2022) show that internet-banking usage and secure digital infrastructure support banking-sector performance in Central and Eastern Europe.

Customer reach, service quality, and competitiveness also improve through digital banking. Digital channels reduce geographical and temporal barriers to access, allowing banks to reach customers beyond branch networks and to serve users continuously. This can make the market bigger, make people happier, and keep them longer, especially if the service journeys are reliable and easy to understand. Deloitte's global Digital Banking Maturity 2024 study of 349 banks in 44 countries found that the level of sophistication of digital channels varies widely. It also found that digital maturity is becoming more important for competitive positioning in retail banking (Deloitte, 2024). Digital banking affects competition in business when it helps a bank get, serve, and keep profitable customers better than other banks.

Another important way is to diversify your income. Digital banking helps non-interest income by increasing payments, card use, merchant services, insurance sales, remittances, subscriptions, and services based on partnerships. This matters because traditional spread income faces pressure in many banking markets. Studies on fintech and digital transformation increasingly suggest that banks with stronger digital capabilities can

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broaden their fee-based revenue base, although the magnitude of the benefit depends on product relevance and the ability to monetize customer activity rather than simply attract digital registrations (Li et al., 2023; Tong & Yang, 2025; Yuan et al., 2025).

The literature nevertheless warns against treating digital banking as an automatic financial success. Cybersecurity is a major offsetting factor. The 2024 Global Financial Stability Report from the IMF says that the financial sector is very vulnerable to cyber risk. It also says that major financial institutions could threaten macrofinancial stability through confidence effects and service disruption (International Monetary Fund, 2024). Digital banking also makes people more dependent on outside tech companies, cloud services, APIs, and data ecosystems, which can lead to concentration and outsourcing risks. These risks are important because they can lead to direct financial losses and high costs for building resilience.

Different patterns of behavior in institutions also show up. Big banks that have been around for a while often have an advantage because they have a lot of customers, a lot of different sources of income, and more trust from customers. This helps them better handle digital investments and make money from digital data. Small and medium-sized banks can still gain a lot from digital channels that make up for their limited physical reach or support niche strategies. Digital-only banks, on the other hand, don't always make more money than traditional banks. The ECB reports that euro area digital banks are characterized by narrow business models and remain less profitable than traditional banks on median ROE, despite their role in intensifying competition and innovation (European Central Bank, 2025). This finding is important because it shows that digital delivery alone does not guarantee superior banking economics.

Overall, seven result patterns are evident. First, digital banking is more reliably associated with cost and process efficiency than with instant profitability. Second, profitability gains strengthen over time when digital investment is combined with operational redesign and data capability. Third, customer growth and non-interest income are major performance channels. Fourth, the relationship between digital performance and other factors is often not straight. Fifth, the results depend on the size of the bank, the business model, and how mature the market is. Sixth, cyber risk and reliance on technology are two important factors that balance each other out. Seventh, digital-only banks and digitally transformed incumbents should not be conflated because their economics differ materially.

Table 2.

Comparative effects of digital banking on commercial bank performance

Performance dimension	Observed direction	Primary mechanism	Key caution
Profitability (ROA/ROE)	Usually positive over time, but often lagged	Improves after migration, scale, and monetization	High up-front technology cost
Cost efficiency	Strong positive effect	Lower servicing cost and less manual processing	Parallel legacy systems can dilute gains

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Operational efficiency	Strong positive effect	Faster turnaround and automation	Requires redesign, not just new interfaces
Customer growth	Generally positive	Wider reach, convenience, retention	Depends on trust, literacy, and usability
Non-interest income	Moderate to strong positive effect	Payments, cards, subscriptions, platform services	Weaker if products remain undifferentiated
Competitiveness	Positive but relative	Better customer proposition and data use	Benefits decline if all rivals converge
Risk profile	Mixed	Better analytics can improve controls	Cyber and concentration risks can rise

The comparison confirms that digital banking improves performance most clearly through cost efficiency and operational productivity. Profitability gains are typically stronger after customer migration, process redesign, and monetization become visible in the operating model.

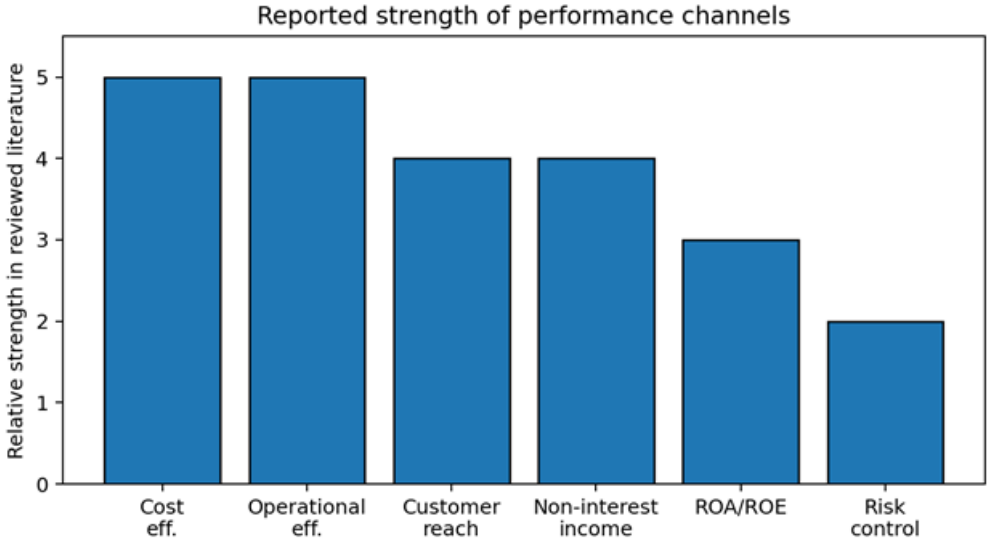


Figure 2. Relative strength of reported performance channels in the reviewed literature

3.2. Discussion

The conversation suggests that the best way to explain why different banks have different outcomes is to look at five related factors: strategy, investment quality, governance, customer adoption, and risk management. Digital banking is useful when it is linked to clear financial goals like lowering the cost of getting a loan, lowering the cost of service, increasing fee income, keeping customers, or improving risk control. When a bank's digital strategy is unclear, symbolic, or not in line with its business goals, it may spend a lot of money on technology without seeing any real improvements in performance. Alqararah et

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al. (2025) stress that improving banking performance depends on more than just buying new technology; it also depends on having the skills to use it.

It's common in practice to think that adopting digital technology will lead to real improvements in financial performance. Metrics such as app registrations, website visits, or nominal digital transaction counts may look impressive, but they do not by themselves show whether the bank has improved its economics. The more relevant questions are whether high-cost assisted transactions have migrated to lower-cost channels, whether digitally active customers hold more products, whether service workflows have been simplified, and whether data are being used to deepen fee-based income and improve risk decisions. In other words, digital adoption matters only when it becomes economic conversion.

The managerial implication is clear. Commercial banks should treat digital banking as a bank-wide strategic performance agenda rather than a stand-alone information-technology project. Each digital initiative should be linked to a defined value hypothesis, a time horizon, and measurable outcomes. Core modernization, cybersecurity, data quality, and architecture are all examples of foundational investments that make assets possible. There are ways to make money through customer analytics, digital sales, and partnerships with other businesses. Banks that mix up these layers often expect to make more money too soon or don't realize where the real value of digitalization comes from.

The results show that regulators have two problems to deal with. On the one hand, policy should make it possible for digital finance ecosystems to be innovative, work together, and compete with each other. On the other hand, regulators must monitor cyber resilience, outsourcing concentration, data governance, and consumer protection. The rise of digital banking changes not only how services are delivered but also how systemic vulnerabilities may emerge. A sound digital-banking policy framework therefore requires both openness to innovation and stronger operational-resilience oversight (Feyen et al., 2021; International Monetary Fund, 2024; European Central Bank, 2025).

The article also talks about lessons that can and can't be used in other situations. The most transferable lesson across contexts is that digital banking is most beneficial when it increases efficiency, attracts new customers, and brings in more money from different sources. Another lesson that can be applied to many situations is that data governance and cyber resilience must be built in from the start. However, the optimal pace of branch rationalization, the economics of digital-only banking, and the speed of customer migration vary widely by country, market maturity, infrastructure, and regulation. Therefore, the strategic principle is transferable, but the operating playbook is not fully universal.

Table 3.

Strategic policy matrix derived from the article's findings

Policy or managerial area	Priority action	Performance implication	Review horizon
Strategy and board oversight	Tie digital initiatives to explicit financial hypotheses	Higher investment discipline and clearer ROE logic	Quarterly

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Core technology and data	Modernize architecture and improve data quality	Lower cost-to-income ratio and better operations	Continuous
Customer migration	Track active usage, self-service share, and conversion	Higher revenue per customer and lower servicing cost	Monthly
Revenue diversification	Expand payments, merchant, insurance, and partnership services	Stronger non-interest income	Quarterly
Cyber resilience	Strengthen cyber controls and third-party oversight	Protects gains by reducing loss events	Continuous
Regulatory ecosystem	Promote interoperability and concentration-risk monitoring	Safer and more sustainable innovation	Annual review

The strategic policy matrix shows that digital banking creates durable financial value when banks sequence core modernization, customer migration, monetization, and cyber resilience as complementary priorities.

4. Conclusions

This article examined the impact of digital banking on the financial performance of commercial banks through a comparative analytical review of recent evidence. The main conclusion is that digital banking generally strengthens financial performance, but the most reliable gains appear first in cost efficiency, operational productivity, customer reach, and revenue diversification. Profitability gains measured by ROA, ROE, and profit efficiency are also frequently observed, yet they are more conditional and often lag behind the initial investment phase.

The central argument of the article is that digital banking should be understood as a strategic transformation of banking economics rather than a simple change in service channels. Banks improve performance when digital interfaces are linked to redesigned processes, better data use, stronger customer economics, diversified fee income, and robust risk controls. Where digitalization remains front-end focused, weakly governed, or insufficiently adopted by customers, the gains are smaller and more volatile.

The broader implication is balanced rather than simplistic. Digital banking can materially improve the financial performance of commercial banks, but results depend on strategy, investment quality, governance, customer adoption, and risk management. Banks that sequence digital investment carefully, simplify processes, build trusted digital journeys, protect resilience, and measure transformation with financial discipline are more likely to convert digital ambition into sustainable performance.

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