THE ECONOMIC EFFICIENCY OF DIGITALIZING BANKING SERVICES

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Abstract

This thesis examines how digital transformation affects the economic efficiency of banking services through transaction-cost reduction, process automation, improved service accessibility, and data-driven decision-making. It synthesizes scholarly and institutional evidence and proposes a practical framework for evaluating efficiency that includes cost per transaction, processing time, digital adoption, operational resilience, and customer outcomes. World Bank Global Findex data demonstrate widespread use of digital payments, although adoption alone cannot establish bank-level profitability. A comparative table differentiates efficiency gains from investment and cyber-risk costs. The study concludes that digitization improves economic performance when technological investments are accompanied by process redesign, cybersecurity, staff development, and inclusion-oriented policies.

Keywords: digital banking, economic efficiency, fintech, operational costs, financial inclusion, automation, return on investment, digital payments.

Introduction

Digitalization has transformed the value chain of commercial banking. Mobile applications, internet banking, instant payment rails, electronic identification, cloud services, and automated credit assessment allow banks to deliver standardized transactions with less dependence on physical branches. Digital transformation nevertheless requires substantial upfront expenditure and creates new dependencies on technology providers. Economic efficiency should therefore be understood as the relationship between measurable economic benefits and the complete life-cycle costs of technology adoption, rather than as the mere number of customers using an app (Vives, 2019; Basel Committee on Banking Supervision [BCBS], 2024).

The relevance of the topic is reinforced by the expansion of financial-service usage. The World Bank reported that 64% of adults worldwide made or received a digital payment in 2021, including 95% in high-income economies and 57% in developing economies (Demirgüç-Kunt et al., 2022). These figures describe consumer behavior, not direct savings attributable to particular banks. The objective of this thesis is to identify economic-efficiency channels and formulate a balanced set of indicators for assessing digital banking investments.

Main Body

1. Sources of economic gains. Digital self-service can lower the marginal cost of routine transfers, statements, account servicing, and bill payments by reducing manual work, paper handling, and branch traffic. Straight-through processing reduces duplicated data entry and may shorten turnaround times. Automated onboarding and authentication can improve scale, while analytical systems may support fraud detection and risk screening. The benefit depends on transaction volumes, system integration, and whether legacy expenses are actually eliminated (Gomber et al., 2017; Vives, 2019).

2. Revenue, access, and competition. Twenty-four-hour mobile access can increase convenience and improve customer retention. Digital distribution broadens geographic reach without requiring a proportional increase in branch facilities; however, it can also strengthen price competition and compress fee income. Financial inclusion is an important social outcome but should not automatically be counted as a bank profit. Evidence suggests effects differ across instruments and countries, and vulnerable users may remain excluded without digital literacy and accessible design (Ozili, 2018; Tok & Heng, 2022; Cevik, 2024).

3. Measurement framework. Banks should compare pre- and post-implementation performance against a credible baseline, using volume-adjusted indicators. One useful operating metric is cost per

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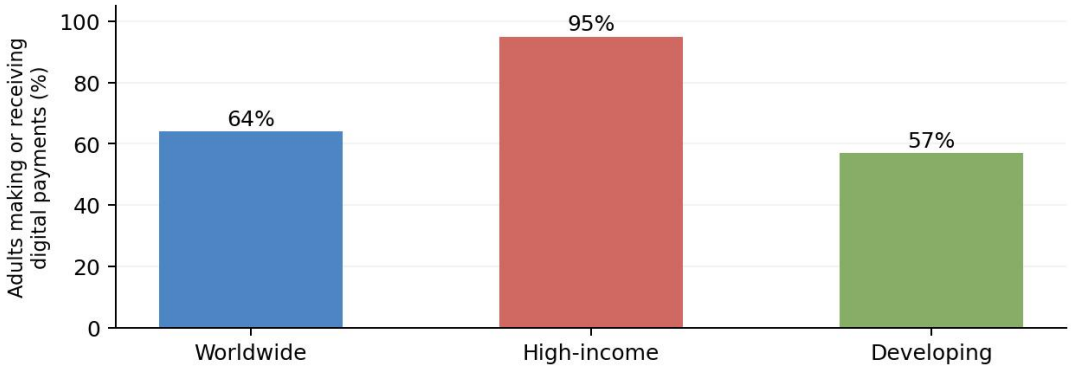
successfully completed transaction: direct and attributable operating expenditure divided by completed transactions. The cost-to-income ratio, average fulfillment time, error/reversal rate, fraud loss rate, customer retention, and digital completion rate offer complementary perspectives. A return-on-investment estimate may be expressed as (discounted incremental benefits minus investment and incremental operating costs) divided by total investment. Attribution requires adjustments for inflation, transaction mix, business growth, and simultaneous reforms (BCBS, 2024).

Table 1. Economic efficiency pathways of digital banking

Dimension	Potential benefit	Countervailing cost / KPI
Routine transactions	Lower staff and paper costs	IT maintenance; cost per transaction
Digital onboarding	Shorter account-opening time	Identity verification; completion time
Credit analytics	Faster initial screening	Model validation; loss / error rate
Mobile distribution	Wider reach, 24/7 service	Cybersecurity; active user share
System integration	Fewer manual reconciliations	Migration expense; failed transactions

The table illustrates why no single metric can establish efficiency. Cost reduction may coincide with higher fixed technology expenditures, and faster onboarding may be offset by additional compliance burdens. In practice, management should evaluate efficiency at product and customer-segment level, rather than relying exclusively on organization-wide averages.

Figure 1. Adults who made or received a digital payment in 2021



Source: World Bank Global Findex Database 2021 (Demirgüç-Kunt et al., 2022). Population-level adoption percentages; not bank profitability or operational cost data.

Figure 1 indicates a meaningful adoption gap between income groups. It provides context for the business case for digital channels, but it does not establish that a specific digital project achieves a particular return. A suitable empirical assessment would compare bank-level costs, transaction volumes, and risk-adjusted returns over time with a matched benchmark.

4. Risks and implementation conditions. Technology may reduce unit costs but can increase exposure to fraud, data breaches, outages, vendor concentration, and model errors. Digital investments can also create temporary dual-running costs when branch and legacy systems remain open. Regulators emphasize operational resilience, third-party oversight, governance, and sound controls as central to responsible digital transformation (BCBS, 2024). Thus, projects should include measurable benefit targets, a phased rollout, independent security testing, and review of accessibility for digitally underserved clients.

Conclusion

Digitalization can improve banking efficiency by scaling routine transactions, accelerating processing, and expanding access. The size and persistence of the gain depend on process redesign,

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utilization rates, legacy-system retirement, regulatory compliance, and cyber resilience. Economic assessments should combine unit costs, revenue effects, user outcomes, and risk-adjusted investment appraisal. Because the evidence summarized here is conceptual and secondary, future research should test these mechanisms using bank-level panel data and transparent comparison groups. For management, the priority is not digitization for its own sake but verifiable improvements in service quality and total economic value.

References :

1. Basel Committee on Banking Supervision. (2018). Sound practices: Implications of fintech developments for banks and bank supervisors. Bank for International Settlements. https://www.bis.org/bcbs/publ/d431.htm
2. Basel Committee on Banking Supervision. (2024). Digitalisation of finance. Bank for International Settlements. https://www.bis.org/publications/digitalisation-finance
3. Cevik, S. (2024). Promise (un)kept? Fintech and financial inclusion (IMF Working Paper No. 2024/131). International Monetary Fund. https://doi.org/10.5089/9798400279195.001
4. Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022). The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19. World Bank. https://doi.org/10.1596/978-1-4648-1897-4
5. Gomber, P., Koch, J.-A., & Siering, M. (2017). Digital finance and FinTech: Current research and future research directions. Journal of Business Economics, 87, 537–580. https://doi.org/10.1007/s11573-017-0852-x
6. Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. Borsa Istanbul Review, 18(4), 329–340. https://doi.org/10.1016/j.bir.2017.12.003
7. Tok, Y. W., & Heng, D. (2022). Fintech: Financial inclusion or exclusion? (IMF Working Paper). International Monetary Fund. https://doi.org/10.5089/9798400208645.001
8. Vives, X. (2019). Digital disruption in banking. Annual Review of Financial Economics, 11, 243–272. https://doi.org/10.1146/annurev-financial-100719-120854
9. World Bank. (2022, July 21). COVID-19 boosted the adoption of digital financial services. https://www.worldbank.org/en/news/feature/2022/07/21/covid-19-boosted-the-adoption-of-digital-financial-services
10. World Bank. (2022). Global financial inclusion (Global Findex) database 2021 [Data set]. https://datacatalog.worldbank.org/search/dataset/0063277/global-financial-inclusion-global-findex-database-2021

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