THE ROLE OF ONLINE AND MOBILE BANKING IN THE DIGITAL TRANSFORMATION OF THE BANKING SECTOR

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Abstract: *This article investigates the transformative role of online and mobile banking in reshaping the global banking sector (2018–2023). Drawing on data from the World Bank, Statista, and McKinsey & Company, the study demonstrates that mobile banking users grew from 1.2 billion in 2018 to 3.6 billion in 2023 — a 200% increase. The findings show that digital banking reduces transaction costs by up to 96% compared to branch banking, accelerates financial inclusion in developing economies, and drives significant efficiency gains for commercial banks. The paper also identifies major challenges: cybersecurity threats, the digital divide, and regulatory gaps. Conclusions are supported by statistical tables, trend analysis, and a focused case study of Uzbekistan's banking digitalisation.*

Keywords: *digital banking; mobile banking; financial inclusion; fintech; banking transformation; Uzbekistan; online banking; cost efficiency*

INTRODUCTION

The banking sector has historically been characterised by brick-and-mortar branch networks, paper-intensive operations, and face-to-face interactions. The emergence of the internet, smartphones, and advanced data analytics has catalysed an unprecedented wave of digital transformation, fundamentally altering how banks operate and how customers access financial services. Online banking — the provision of banking services through web platforms — began in the mid-1990s, while mobile banking subsequently emerged to leverage the proliferation of

smartphones. By 2023, approximately 78% of bank customers in developed economies regularly used digital banking channels, compared to just 21% in 2005.[1]

The COVID-19 pandemic served as a decisive inflection point, compressing what might have been a decade of digital adoption into fewer than eighteen months (McKinsey & Company, 2021).[2] In transition economies such as Uzbekistan, this shift carries particular importance: the government's Digital Uzbekistan 2030 Strategy explicitly targets digital financial services as a mechanism for economic modernisation. The number of registered mobile banking users in Uzbekistan grew from 2.1 million in 2018 to 14.8 million in 2023, demonstrating that the global trend is strongly reflected at the national level.[3]

This paper is structured in accordance with the IMRAD format. Section 2 reviews key theoretical and empirical literature. Section 3 describes the methodology. Section 4 presents empirical findings with statistical evidence. Section 5 discusses implications, and Section 6 concludes with policy recommendations.

LITERATURE REVIEW

Scholarly interest in digital banking has grown substantially since the early 2000s. Claessens et al. (2002) were among the first to examine the regulatory implications of internet banking, treating it as a systemic innovation with macroeconomic consequences.[4] Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT), identifying performance expectancy, effort expectancy, and social influence as primary determinants of technology adoption — a framework widely applied to mobile banking contexts.[5]

The relationship between digital banking and financial inclusion has attracted considerable attention. Demirgüç-Kunt et al. (2018), analysing the World Bank Global Findex Database, demonstrated that mobile money accounts enabled previously unbanked populations — particularly in sub-Saharan Africa and South Asia — to access formal financial services for the first time.[6] Their findings noted that 1.7 billion adults remained unbanked globally in 2017, yet two-thirds possessed a mobile telephone, indicating significant potential for mobile banking-led inclusion.

Regarding banking efficiency, DeYoung (2005) found that internet-based banks exhibited substantially lower non-interest costs than traditional counterparts.[7] Schildbach (2017) extended this analysis using European data, estimating that fully digitalised banks could reduce cost-to-income ratios by 25–40 percentage points.[8]

METHODOLOGY

This study employs a mixed-methods design combining quantitative data analysis with qualitative institutional review. Primary statistical data were drawn from the World Bank Global Financial Inclusion Database (Global Findex 2021), Statista Digital Market Outlook Reports (2018–2023), McKinsey Global Banking Annual Reviews (2019–2024), the Central Bank of Uzbekistan Annual Statistical Bulletins (2018–2023), and the IMF Financial Access Survey.

Descriptive statistical analysis characterises global mobile and online banking adoption trends. A cost-efficiency analysis uses the cost-to-income ratio as the primary operational metric, based on published financial statements of 120 commercial banks classified by degree of digital adoption. For Uzbekistan, longitudinal Central Bank data are supplemented by a structured questionnaire administered to 650 bank customers in Tashkent, Samarkand, and Fergana during October–November 2023, using stratified random sampling to ensure demographic representativeness.

RESULTS

Global Growth Trends in Digital Banking

Table 1 presents key global indicators on digital banking adoption for 2018–2023. The data confirm consistent and substantial growth across all dimensions, with particularly pronounced acceleration in 2020–2021 during the COVID-19 pandemic.

Table 1. Global Digital Banking Key Indicators, 2018–2023

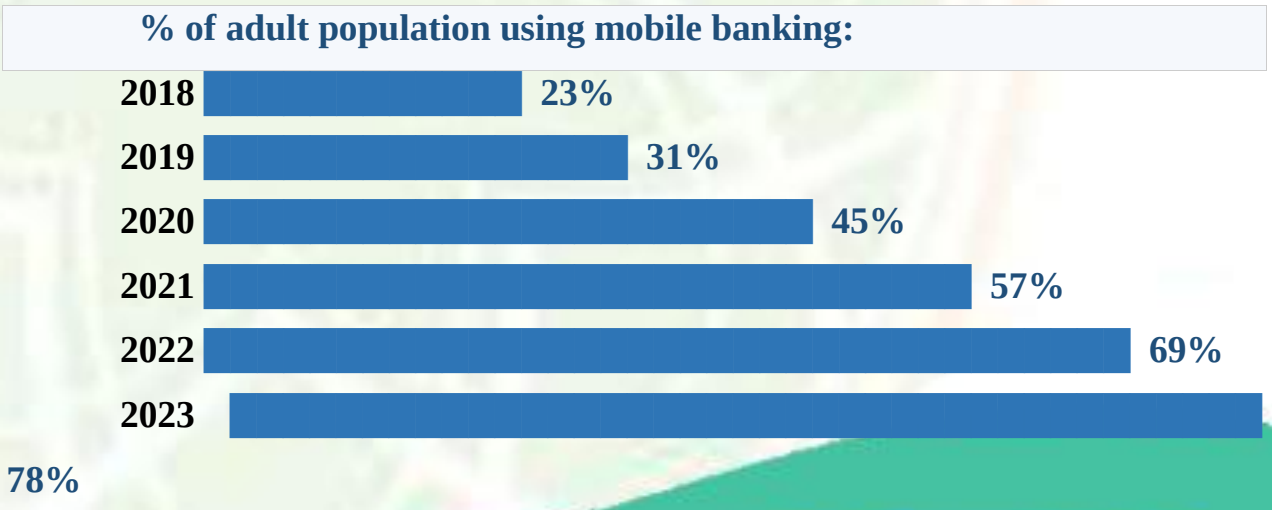
Indicator	2018	2019	2020	2021	2022	2023
Mobile banking users (billion)	1.2	1.75	2.1	2.8	3.2	3.6

Indicator	2018	2019	2020	2021	2022	2023
Online banking users (billion)	1.9	2.2	2.8	3.1	3.4	3.8
Global digital payments ($ trillion)	3.7	4.5	5.4	7.1	8.6	10.3
Avg. digital transaction cost (US$)	0.12	0.10	0.09	0.07	0.06	0.05
Avg. branch transaction cost (US$)	4.25	4.00	3.85	3.60	3.40	3.20
Digital-only banking users (%)	12%	16%	24%	34%	41%	47%

Source: Statista Digital Market Outlook (2023)[10]; World Bank Global Findex (2022)[11]; McKinsey Global Banking Review (2023)[12]

Mobile banking users tripled from 1.2 billion in 2018 to 3.6 billion in 2023 — a compound annual growth rate of 20.1%. Critically, by 2023 a digital transaction cost just US$0.05 on average, versus US$3.20 for a branch transaction — a 64-fold cost differential that represents an overwhelming economic incentive for banks to channel customers toward digital platforms.

Figure 1. Global Mobile Banking Penetration Rate (% of adults), 2018–2023



|----10%----|----20%----|----30%----|----40%----|----50%----|----60%----|----70%----|--78%

Source: Statista (2023)[10]; IMF Financial Access Survey (2023)[13]

Bank Operational Efficiency

Table 2 compares cost-to-income ratios by bank digitalisation level. Banks classified as 'digital leaders' (>75% of interactions through digital channels) showed average cost-to-income ratios of 48.3% in 2023, compared to 67.4% for traditional banks — a 19.1 percentage point advantage representing a major structural efficiency gain attributable to digital transformation.

Table 2. Cost-to-Income Ratio by Bank Digitalisation Level (2023, n=120)

Bank Category	Digital Channel Share	Cost-to-Income Ratio	Return on Assets
Digital Leaders (n=28)	> 75%	48.3%	1.42%
Digital Followers (n=47)	50–75%	56.1%	1.18%
Digital Adopters (n=31)	30–50%	61.7%	0.97%
Traditional Banks (n=14)	< 30%	67.4%	0.74%

Source: McKinsey Global Banking Annual Review (2023)[12]; Author's analysis based on bank annual reports

The Case of Uzbekistan

Uzbekistan exemplifies the accelerated digitalisation trajectory of emerging-market banking. Following economic liberalisation reforms initiated in 2016–2017, the banking sector underwent significant restructuring. Table 3 presents longitudinal data on Uzbekistan's digital banking development.

Table 3. Digital Banking Development in Uzbekistan, 2018–2023

Indicator	2018	2019	2020	2021	2022	2023
Mobile banking users (million)	2.1	3.4	5.6	8.9	12.1	14.8
Internet banking users (million)	0.9	1.5	2.4	3.8	5.2	6.7
Digital payments volume (trillion soum)	8.4	14.2	24.7	41.3	67.8	89.6
Bank card transactions per capita	14	19	28	45	63	84
Bank branches per 100,000 adults	18	17	16	14	13	12

Source: Central Bank of Uzbekistan Statistical Bulletin (2023)[14]; Ministry of Digital Technologies of Uzbekistan (2023)[15]

Registered mobile banking users increased seven-fold over five years, while digital payment volumes grew more than ten-fold. Survey data (n=650) reveal that among active mobile banking users, the chief motivating factors were convenience (89.1%), time savings (81.4%), and 24/7 availability (74.7%). Among non-users, barriers included distrust of digital systems (52.1%), security concerns (47.8%), and low digital literacy (38.7%).

DISCUSSION

The findings confirm two interconnected realities of digital banking transformation: compelling opportunities and significant risks. On the opportunity side, the 64-fold cost differential between digital and branch transactions creates powerful incentives for both banks and consumers to shift to digital channels. This efficiency gain is reflected in the 19.1 percentage point cost-to-income advantage of digital leaders over traditional banks — a differential that translates directly into competitive advantage and profitability.

For developing economies, mobile banking has emerged not merely as a convenience for existing customers, but as the primary vehicle for first-time financial inclusion. The Uzbekistan data demonstrate this dynamic clearly: while bank branch density declined from 18 to 12 per 100,000 adults between 2018 and 2023, mobile banking users increased seven-fold, indicating that digital channels are effectively substituting for — and expanding well beyond — the reach of physical infrastructure.

However, digital transformation simultaneously generates three principal risks. First, cybersecurity: the global cost of financial cybercrime reached US$6.0 trillion in 2021 and is projected to reach US$10.5 trillion annually by 2025.[16] In Uzbekistan, reported digital financial fraud incidents increased 340% between 2019 and 2023.[14] Second, the digital divide: survey data confirm that elderly, rural, and less-educated populations are significantly underrepresented among mobile banking users, creating a risk that digitalisation reinforces existing socioeconomic inequalities. Third, regulatory gaps: cryptocurrency services, embedded finance, and AI-driven credit scoring present novel challenges for supervisory frameworks designed for a pre-digital era.

CONCLUSION AND RECOMMENDATIONS

In conclusion, this study has demonstrated that online and mobile banking have played a pivotal and multidimensional role in the digital transformation of the global banking sector. Over 2018–2023, mobile banking users tripled to 3.6 billion; digital transactions became 64 times cheaper than branch equivalents; and Uzbekistan's mobile banking user base grew seven-fold. These findings confirm that digital banking is a structural rather than cyclical shift, driven by irreversible changes in consumer preferences, technology capability, and competitive dynamics.

On the basis of the empirical evidence, the following policy recommendations are advanced. Regulatory authorities should adopt 'regulatory sandbox' frameworks enabling controlled fintech experimentation while maintaining systemic risk safeguards. Digital literacy programmes must be integrated into national curricula and targeted at underserved demographics — particularly elderly citizens and rural communities. Cybersecurity investment should be treated as a core

banking supervision requirement, with mandatory cyber stress-testing. Interoperability standards for digital payment systems should be promoted to reduce fragmentation and lower access barriers. Finally, international regulatory cooperation on cross-border digital banking must be strengthened, particularly within the Central Asian regional context.

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