



The Impact of Mobile Payments on Traditional Banks and the Countermeasures Adopted by Traditional Banks

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Abstract. This study seeks to investigate the influence of the accelerating adoption of mobile payments on traditional banking services, with particular emphasis on addressing pertinent challenges related to user acceptance, security and privacy protection, technological infrastructure, as well as regional differences and market demands. The importance of this issue lies in the necessity for banks to maintain competitiveness and for scholars to deepen their understanding of the effects of financial technology (fintech) on conventional financial institutions. To achieve this objective, the study employs systematic literature review and case analysis methodologies to assess the evolution of mobile payments across various global regions and to explore the responsive strategies enacted by traditional banks in these contexts. The findings reveal that the rise of mobile payments has profoundly transformed the operational landscape for traditional banks. In response to these transformations, banks must enhance user experience, bolster data security and privacy measures, upgrade technological infrastructure, and formulate strategies that cater to regional market requirements. The implications of this research encompass the provision of specific strategic recommendations for traditional banks to navigate the repercussions of mobile payments and the establishment of a new theoretical framework for future inquiries within the field of financial technology.

Keywords: Mobile Payments, Traditional Banking, User Acceptance, Security and Privacy, Technological Infrastructure, Regional Differences.

1 Introduction

The banking industry occupies an irreplaceable and significant position within the modern economy. As the centerpiece of the financial system, banks are not solely tasked with the storage and lending of funds; they also play a pivotal role in promoting economic growth, regulating the money supply, and providing payment services. Through a comprehensive array of financial services, banks facilitate the development of enterprises, the accumulation of personal wealth, and the stable operation of the national economy. The effective functioning of the banking industry serves as the cornerstone for maintaining economic order, ensuring the stability of financial markets, and advancing social progress. Consequently, the role of banks in

the social economy is essential. Nonetheless, recent years have witnessed the rapid advancement of science and technology, particularly with the proliferation of mobile Internet, leading to the emergence of mobile payment as a novel payment method. Characterized by high efficiency and convenience, mobile payment not only satisfies consumer demand for expedited transactions but also offers merchants flexible and diverse payment solutions. From shopping and dining to transportation, mobile payment has permeated all facets of daily life, rendering it an indispensable element. Data indicates that the market size of mobile payment is expanding rapidly on a global scale, especially in emerging economies such as China, where the prevalence and frequency of mobile payment have significantly surpassed traditional payment methods.

The swift evolution of payment methods has presented unprecedented challenges to the traditional banking sector. Firstly, the convenience and flexibility associated with mobile payment have attracted a substantial consumer base, thereby posing a risk of marginalization to the payment channels of traditional banks. Secondly, ongoing innovations in data security and privacy protection related to mobile payment have further diminished the competitiveness of traditional banks. Furthermore, mobile payment integrates big data and artificial intelligence technologies to provide personalized financial services, thereby exerting considerable pressure on banks that adhere to traditional business models. Consequently, this study will conduct a thorough analysis of the impact of mobile payment on traditional banks, focusing on user acceptance, security and privacy protection, and technical infrastructure, while also exploring the countermeasures implemented by traditional banks in response to these challenges, with the aim of providing robust support for the future transformation and development of the banking industry.

2 Literature Review

2.1 The Popularization of Mobile Payments and User Acceptance

Current research predominantly focuses on user experience and technological convenience, often overlooking the challenges posed by a lack of user education in the promotion of mobile payments. To mitigate the impact of mobile payments on traditional banks, it is imperative for banks to proactively enhance user acceptance by optimizing user experience and providing necessary support to maintain market competitiveness. Many users, particularly the elderly, express concerns about the security and complexity of mobile payment operations. Studies have shown that user education plays a crucial role in improving both the acceptance and trust in mobile payments [1]. Kenya's M-Pesa is a successful example of mobile payment, offering basic financial services through SMS, enabling a large number of unbanked individuals to deposit, transfer, and make payments. M-Pesa's success is largely attributed to its simple and intuitive interface, as well as its extensive agent network.

However, other African countries attempting to replicate the M-Pesa model have faced slower adoption rates due to insufficient technological infrastructure and inadequate user education. To respond to the competition posed by mobile payments,

traditional banks should adopt the following measures to enhance user acceptance of their mobile payment services: (1) Optimize User Experience: Design simple and intuitive user interfaces, reduce operational steps, and improve the overall usability of mobile payment applications. (2) User Education: Regularly organize user education activities, provide clear and concise educational materials, and offer one-on-one guidance, particularly targeting elderly users. (3) Customer Support: Establish an efficient customer support system, offering 24/7 technical assistance and advisory services to help users resolve any issues encountered during mobile payment usage. In emerging markets, user acceptance of mobile payments is driven by perceived convenience, cost of use, and social influence. In particular, user education and market promotion have been proven to be effective means of increasing user acceptance [2]. Future research should place greater emphasis on exploring user behavior and psychology to better understand users' actual needs and pain points in mobile payments, thereby offering traditional banks more targeted recommendations for improvement. By implementing these strategies, traditional banks can enhance user acceptance of their mobile payment services while simultaneously mitigating the impact of mobile payments on their business, thus maintaining their market competitiveness.

2.2 Security and Privacy Concerns

As mobile payments become increasingly widespread, issues surrounding data security and privacy protection have come to the forefront. Shaikh and Karjaluoto noted that while mobile payments have improved transaction efficiency, they have also introduced technical risks and data privacy challenges [3]. Alqudah further emphasized the critical importance of data security and user privacy protection [4]. Despite the widespread adoption of data encryption and multi-factor authentication by banks to promote mobile payments, concerns about data breaches among users remain persistent. Current research primarily focuses on the implementation of security technologies and privacy protection measures, but lacks a deeper analysis of user psychology and behavior. Future studies should explore users' acceptance of various security measures, such as biometric authentication and multi-factor authentication, and evaluate the effectiveness of these measures in practice. Additionally, research should investigate how transparent communication and user education can be used to build trust. For example, banks can issue regular security reports to inform users about the measures in place to protect their data and the effectiveness of those measures, alleviating concerns about data breaches. Data security and privacy protection remain top concerns for users when it comes to mobile payments. Suryono and Purwandari pointed out that fears of data breaches are a major barrier to the further adoption of mobile payments [5]. Apple Pay, as an emerging mobile payment system, has strengthened payment security through biometric technologies such as fingerprint and facial recognition.

However, despite these innovations, concerns about the security of biometric data persist. In response, traditional banks collaborating with Apple Pay have enhanced data encryption and privacy protection. For instance, Citibank has partnered with Apple Pay to provide users with multi-layered security protection, including real-time

transaction monitoring and fraud detection systems, to ensure the safety of users' funds and personal information. Traditional banks should further invest in the development of data encryption technologies, improve privacy protection standards, and explore the application of blockchain technology to enhance data transparency and security, thereby increasing user trust in mobile payments. Future research should focus on developing more effective technical measures and user education strategies to ensure data security and privacy protection, thereby reducing the disruptive impact of mobile payments on traditional banking. Specific measures include developing more advanced encryption technologies, implementing multi-layered authentication mechanisms, and leveraging blockchain technology to improve transaction transparency. Additionally, studies should explore how regular security report releases and transparent communication strategies can enhance user trust in mobile payments, helping traditional banks maintain a competitive edge.

2.3 Technological Infrastructure and Innovation

The widespread adoption of mobile payments necessitates continuous upgrades in banks' technological infrastructure. Yiping Huang and Xue Wang suggest that banks should strengthen their collaborations with tech companies to optimize payment systems, enhance transaction speed, and improve reliability [6]. By incorporating technologies such as blockchain and cloud computing, banks can decentralize transaction processing, reduce costs, and increase transparency. However, banks currently face challenges and limitations in upgrading their technological infrastructure. While existing research highlights the importance of robust infrastructure, many banks, particularly in resource-constrained environments, lack sufficient funding and technical capabilities to implement these innovative technologies. Omarini pointed out that regional policy environments and market demands play a critical role in the development of mobile payments, but many areas lack adequate policy support and market incentives, resulting in slow technological upgrades [7]. While blockchain and cloud computing hold great potential, their practical application still faces several challenges. For example, the performance and efficiency of blockchain in handling large-scale transactions need further refinement, and the cost-effectiveness of cloud computing across different market environments has yet to be fully evaluated. Patil noted that despite significant research on technological infrastructure, banks continue to face numerous technical and non-technical barriers in practical implementation [8].

A notable example is India's Unified Payments Interface (UPI), developed by the National Payments Corporation of India (NPCI), which allows users to perform various banking transactions through a single interface. While UPI significantly simplified payment processes and improved transaction speed, replicating its success in other countries may face technical and policy challenges. In response to the competitive pressure from UPI, traditional banks in India have invested heavily in upgrading their technological infrastructure. For instance, the State Bank of India (SBI) has not only integrated with the UPI platform but has also launched its own mobile payment app, "YONO," which leverages artificial intelligence and big data analytics to provide personalized financial services. However, implementing these

innovations in resource-limited environments can pose even greater challenges. By collaborating with tech companies, traditional banks can effectively leverage emerging technologies such as blockchain and cloud computing to enhance their technological infrastructure and maintain competitiveness amidst the growing impact of fintech [9]. Future research should focus more on strategies for implementing technology in practical applications, particularly in resource-constrained environments. Specific strategies include enhancing system efficiency by sharing technological resources and costs through collaboration, developing localized technological solutions to address challenges in different market conditions, and evaluating the real-world applications and cost-effectiveness of blockchain and cloud computing in diverse market environments. Moreover, research should also investigate how to overcome the performance bottlenecks of technology in large-scale transactions, ensuring that technological innovations can genuinely help traditional banks respond to the disruption caused by mobile payments and retain their competitive edge and market share.

2.4 Regional Differences and Market Demand

The development of mobile payments exhibits significant regional differences across the globe. Huong Ha and Peter Chuah's research on Southeast Asia reveals a lack of policy support and insufficient market demand in that region [10]. In contrast, Yiping Huang and Xue Wang argue that government backing and robust market demand are key drivers behind the success of mobile payments in China [6]. These studies suggest that the policy environment and market demand in different regions play a critical role in shaping the development of mobile payments. While current research has identified the impact of regional differences, there is a lack of detailed analysis on specific policy and market strategies. Future studies should further analyze successful cases to extract promotional strategies applicable to different regions. For example, in areas with insufficient market demand, research should explore how policy incentives and marketing campaigns can increase user adoption. Furthermore, researchers should investigate how market research and user feedback mechanisms can be used to design mobile payment products and services tailored to local needs, ensuring their feasibility and sustainability across different cultural and economic environments.

In China, the rapid proliferation of mobile payments has been driven by strong government support and massive market demand. Alipay and WeChat Pay dominate the market, allowing users to integrate mobile payments into almost every aspect of daily life, from shopping and public transportation to healthcare payments. In response to this competition, traditional banks such as China Construction Bank and Bank of China have made significant investments in developing their own mobile payment applications and have partnered with Alipay and WeChat Pay to offer more convenient services. For instance, China Construction Bank launched the "Dragon Pay" platform, integrating various payment methods to enhance user experience. Additionally, government policies promoting cashless cities have accelerated the transformation of traditional banking operations. In Europe, however, the highly regulated environment has had a significant impact on the development of mobile payments. Traditional banks such as Deutsche Bank and Barclays must ensure

compliance with local legal requirements when promoting mobile payment services, but they also leverage this regulatory framework to build user trust. For example, Barclays launched the "Pingit" App, which not only offers fast money transfers but also emphasizes its security features, attracting a large user base. Future research should delve deeper into how policy incentives and marketing campaigns can improve user adoption in regions with low market demand, thereby reducing the negative impact of mobile payments on traditional banks. Governments can offer financial support or tax incentives to encourage private companies to invest in payment infrastructure development. Additionally, research should examine how mobile payment products and services can be designed based on local needs through market research and user feedback, ensuring their feasibility and sustainability in different cultural and economic environments. These strategies will help traditional banks maintain their competitiveness and market share in an increasingly mobile payment-driven landscape.

3 Conclusion

This study examines the multifaceted impact of the rapid development of mobile payments on traditional banking and provides an in-depth analysis of strategies banks can employ to address these challenges. Through a detailed exploration of factors such as user acceptance, data security and privacy protection, technological infrastructure upgrades, and regional differences, the paper concludes that the widespread adoption of mobile payments has significantly transformed the operational landscape of traditional banks, compelling them to make strategic adjustments to remain competitive. The findings suggest that banks should focus on enhancing user experience, strengthening data security measures, investing in emerging technological infrastructures, and developing strategies that align with regional market demands to effectively respond to the challenges posed by mobile payments. Moreover, this study offers practical and theoretically valuable recommendations for how traditional banks can maintain competitiveness in a mobile payment-driven environment.

However, there are several limitations to this study. First, due to constraints in data availability and time, the research primarily relies on existing literature and case studies, lacking fieldwork and first-hand data. Additionally, the study only covers a portion of the impacts that mobile payments have on traditional banking. Future research could further explore the long-term effects of other fintech innovations, such as blockchain technology and the application of artificial intelligence in the financial sector. Future studies should also place greater emphasis on the specific needs and policy environments of different regional markets, providing traditional banks with more localized and targeted strategies on a global scale. By overcoming these limitations, future research will be better positioned to understand and address the ongoing impact of rapid fintech development on the traditional banking industry.

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