Management & Economics Research Journal
ISSN 2710-8856
ISSN 2676-184X
University of Djelfa - Algeria
https://www.asjp.cerist.dz/en/PresentationRevue/615

Vol. 06 No. 02 (2024). P. 589-609

# The evolution of digital wallets ecosystems: A comparative analytical study of the experience of India and Pakistan towards financial inclusion during 2010-2022

Bouziani Nour El Houda* [(1)]
Nourelhouda.bouzaini@univ-relizane.dz
University of relizane, (Algeria)

Tahraoui douma Ali [(2)]
Ali.tahraouidouma@univ-relizane.dz
University of relizane, (Algeria)

Benadda M'hamed [(3)]
Mhamed.benadda@univ-relizane.dz
University of relizane, (Algeria)

Received :25/01/2024 Accepted :28/05/2024

## Abstract

This research paper aims to study the development of digital wallet systems in India and Pakistan, and analyze their impact on financial inclusion during the period 2010-2022, using the comparative approach, and with the help of reports from the World Bank, the Reserve Bank of India, and the State Bank of Pakistan on the level of development of digital wallets, and user adoption rates, The volume of transactions, and their impact on financial inclusion in both countries.

The study found that, India has witnessed significant growth rates in the extent of adoption of digital wallets and the development of the financial inclusion index, due to the favorable regulatory environment and the state's contributions to promoting financial education and various financial inclusion initiatives, while

* Corresponding author:Bouziani nourelhouda, Tahraoui douma Ali, Benadda Mhamed .

Pakistan has witnessed steady growth rates due to initiatives that are still in their infancy around financial inclusion, despite gender access gaps and regulatory and infrastructure gaps, India's success factors include national digital platforms, private sector innovations, and financial inclusion drivers .

**Keywords** : digital wallets; *financial inclusion; financial technology.*

## 1. INTRODUCTION

The global financial landscape has witnessed a profound transformation over the past decade, driven by the relentless pace of technological innovation. Among the noteworthy developments, the rise of digital wallets has emerged as a pivotal force shaping the contours of financial ecosystems. This study embarks on a comparative analytical journey, delving into the evolution of digital wallet ecosystems in two dynamically evolving economies, India and Pakistan, during the period spanning 2010 to 2022.

The concept of digital wallets, also known as e-wallets, has evolved from a convenience tool for online transactions to a cornerstone of financial inclusion strategies. As both India and Pakistan grapple with the challenges of extending financial services to the unbanked and underbanked populations, the role of digital wallets has become increasingly prominent. These digital instruments not only offer a convenient means of conducting transactions but also serve as gateways to broader financial inclusion by providing access to a range of banking and financial services.

**Therefore, this research paper seeks to address the following problem:**

How has the development of digital wallet systems shaped the trajectory of financial inclusion in India and Pakistan from 2010 to 2022 ?

This comprehensive investigation includes a multi-faceted exploration of the technological innovations adopted and their impact on the level of financial Inclusion in these two South Asian countries.

**HYPOTHESIS:** Based on the information provided, the study proceeds from the following :

- **H0:** The adoption of digital wallets in India and Pakistan contributed significantly to improving the level of financial inclusion in both countries during the period 2010-2022.

**OBJECTIVE OF THE RESEARCH:** The research seeks to reveal the multifaceted dimensions of digital wallet systems in India and Pakistan, the study will examine the technological infrastructure and political interventions that shaped the path of digital financial inclusion in both countries, and by tracking the chronological development from 2010 to 2022, we seek To highlight the challenges and success stories that characterized the journey of these two countries in embracing digital wallets and benefiting from them as tools to improve the level of financial inclusion.

**RESEARCH METHODOLOGY:**

The main idea of this research is to find out how digital wallet systems contribute to shaping the path of financial inclusion in India and Pakistan. This research paper uses the comparative approach using the following tools:

- **Quantitative data:** Transaction volume, user base, bank account ownership, credit access data from central bank reports (RBI and SBP), World Bank Global Findex, and industry reports.

- **Qualitative data:** Insights from news articles, research papers, and policy documents on digital wallet initiatives in both countries.

**RESEARCH GAPS:**

There are few studies that compare digital wallet systems between India and Pakistan specifically, this study aims to fill this gap through comparative analysis, as most previous studies focused on adoption factors rather than the impact on financial inclusion, and this study analyzes the impact of digital wallets on financial inclusion indicators.

**STUDY STRUCTURE:** To answer the problem raised, the research was divided into:

This research paper is organized into four sections.

The second section presents a study of the literature related to the subject of the study, and the third section contains an overview of financial inclusion in India compared to Pakistan, while the fourth section focuses on comparing the level of development of digital wallets and their role in improving financial inclusion in India compared to Pakistan, the last section concludes the study and summarizes the main results reached, in addition to suggestions.

## 2. LITERATURE REVIEW

The primary objective of this research paper is to enhance our understanding of the motivations and challenges related to the adoption of Digital Financial Transactions (DFTs). Through a comprehensive review of existing literature on DFTs, specifically focusing on empirical studies published between 2009 and 2020, the study aims to identify factors influencing DFT adoption and pinpoint research gaps. The researchers have identified fifteen factors that drive the adoption of DFTs, such as perceived usefulness, ease of use, compatibility, trust, security, effort expectancy, and performance expectancy. Additionally, the study highlights five barriers to adoption, including the cost of use, perceived risk, complexity, resistance to change, and privacy concerns. The findings lay the foundation for a future research agenda in this area. (K. Kajol, singh, & paul, 2022); As for Ricardo Heredia, he seeks to evaluate the popularity and impact of Apple Pay and digital wallets since the fall of 2014 on the development of the payment system in Mexico and the United States. The study uses a comprehensive methodology that includes a detailed analysis of Apple Pay's features, regulatory frameworks, literature review, and exploration of specific elements that contribute to its potential as a financial revolution. The research integrates both technological and legal perspectives to provide a comprehensive understanding, ultimately concluding that rather than constituting an ongoing financial revolution, Apple Pay and digital wallets mark an evolutionary stage in the payment system in Mexico and the United States. The study confirms that current financial systems lack strict implementation, leading to regulatory gaps. Therefore, the report recommends that the financial authorities in both countries issue appropriate guidelines or enact amendments to correct these loopholes within the financial systems. This proactive approach is crucial to paving the way towards a potentially transformative financial revolution in the future. (SALAZAR, 2017), The study by Cass Hanna, Lyons and Liu aims to explore the relationship between multidimensional measures of financial and digital literacy and financial behaviors associated with enhancing resilience, with a particular focus on saving, borrowing and risk management. Using data from InterMedia Financial Inclusion Insights (FII) studies across seven countries in South Asia and Sub-Saharan Africa, the research uses Probit models to empirically investigate the relationship between financial and digital literacy and various financial behaviors to build resilience. These behaviors are categorized into saving, borrowing, insurance coverage, and preparing an emergency fund. Consistent findings suggest that financial and digital literacy play critical roles in shaping financial behaviors that help build resilience. The observed differences between regions and population groups underscore the need to take into account social and economic factors when designing effective financial education initiatives. ( Kass-Hanna, Lyons, & Liu, 2021), Digital Financial Inclusion in Southeast Asia The main goal is to identify a path through which diverse countries in Southeast Asia can leverage the ongoing technological revolution to accelerate financial inclusion. The paper begins by defining financial inclusion and engaging in a dialogue about digital technology that facilitates efforts in this area. Next, the report reviews the recent status of digital financial inclusion in Southeast Asian countries based on the results of the Global Financial Inclusion Survey. The paper examines the initiatives taken by Southeast Asian countries to move towards an inclusive digital economy, and analyzes these initiatives in light of the different stages of evolutionary development. In addition, the research provides a planning framework and roadmap tailored to each country, taking into account its current circumstances and identifies the actions, resources, processes and regulatory frameworks needed to advance the integration of digital finance. (Koh, Phoon, & Ha, 2018), The study ( Durai & Stella, 2019) investigated the impact of digital finance, encompassing online banking, mobile banking, mobile wallets (apps), credit cards, and debit cards, on achieving financial inclusion. The findings indicated that mobile banking benefited positively from factors such as ease of use, convenience, precise timing, and easy inter-bank account facilities, additionally, mobile wallets (apps) were significantly influenced in a positive manner by low service fees and precise timing, Furthermore, credit cards showed a noteworthy positive impact specifically from low service fees, the primary data for this analysis were collected using a questionnaire, and the Statistical Package for the Social Sciences (SPSS) version 20.0 was employed, utilizing one-way analysis of variance (ANOVA) for statistical analysis, Arvind Panagariya sought to examine the digitalization of finance in India, with a particular focus on two key areas: the role of biometric identification (Aadhaar) in simplifying financial transactions and the impact of digital finance on entrepreneurship, particularly in the fintech and digital technology sectors, Using a qualitative analysis approach, this paper delves into the complexities of these two aspects. The analysis includes a comprehensive examination of how Aadhaar impacts financial transactions and an assessment of the broader impact of digital finance on entrepreneurial endeavors. Aadhaar is emerging as an important asset in the digitization of finance, providing comprehensive identity verification through biometric means and simplifying electronic transfer processes. Despite current legal concerns regarding data privacy, both government and private entities are actively exploring innovative applications for Aadhaar. The study indicates a relatively modest success rate in digital technology entrepreneurship, especially in the manufacturing sector. However, in the field of digital entrepreneurship, there is a more positive trajectory, with many startups expanding their influence and entering into foreign markets. ( Panagariya, 2022), In Pakistan, the Ramzan, Amin, Abbas paper examines the influence of corporate social responsibility (CSR) on financial performance, financial inclusion and financial stability within the banking sector, focusing on annual data for twenty Pakistani commercial banks spanning the years 2008 to 2017. The study uses a panel data approach , which includes annual data from 20 banks listed on the Pakistan Stock Exchange over a ten-year period. The results reveal that CSR, along with factors such as age and size, has a positive impact on all three criteria. However, high levels of financial leverage are associated with lower financial inclusion and financial stability. In addition, financial inclusion shows a negative relationship with asset tangibility. ( Ramzan, Amin, & Abbas , 2021)

## 3. RESULTS AND DISCUSSION

### 3.1 Overview Of Financial Inclusion In India Vs Pakistan

Financial inclusion, as various academics and financial institutions have defined it, encompasses different dimensions related to access to financial services, one proposed definition emphasizes universal access to affordable financial services, covering saving, investing, borrowing, and insurance, facilitated by sustainable institutions ( BELKACEMI, 2023), India, despite being one of the fastest-growing and most populous countries globally, faces challenges in providing formal banking services to a significant portion of its rural and tribal areas, the financially deprived individuals, often with unpredictable incomes, struggle to manage their finances and require easy access to savings, small loans, insurance, and payment and transfer services to meet a diverse range of financial needs ( Asif, Naved Khan, Tiwari, Wani, & Alam, 2023), In contrast, Pakistan has a very low level of financial inclusion with only a fifth of the adult population having access to formal bank accounts (Hassnian & Rose, 2017, p. 163), the following is an analysis of the development of financial inclusion indicators in India and Pakistan.

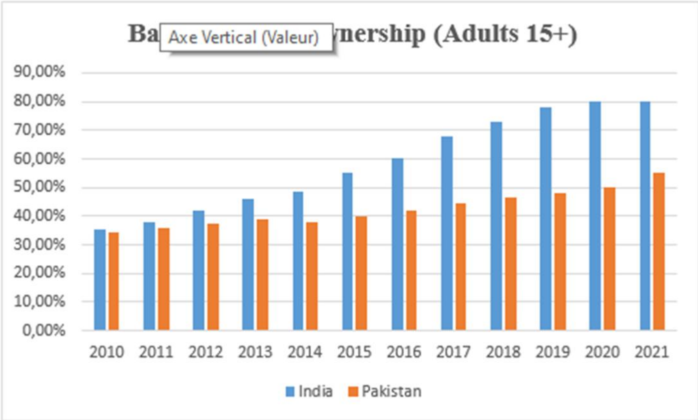
#### 3.1.1 Bank Account Ownership (Adults 15+)

**Table 1. Bank Account Ownership (Adults 15+) in (India vs، Pakistan)**

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **India** | 35.5 % | 38.0 % | 42.0 % | 46.0 % | 48.6 % | 55.0 % | 60.0 % | 67.7 % | 73.0 % | 78.0 % | 80.0 % | 80.0 % |
| **Pakistan** | 34.2 % | 35.8 % | 37.4 % | 39.0 % | 38.0 % | 40.0 % | 42.0 % | 44.6 % | 46.4 % | 48.2 % | 50.0 % | 55.0 % |

**Source:** (Global Findex Database, 2010-2021)

**Fig.1. Bank Account Ownership (Adults 15+)**




**Source:** prepared by researchers based on table 1 data.

The table and graph illustrate the percentage of adults aged 15 and above in India and Pakistan who own a bank account during the period from 2010 to 2021; The data reveals an increase in bank account ownership in both India and Pakistan over the study period, with a faster growth rate in India compared to Pakistan, In 2010, 35.5% of adults in India and 34.2% in Pakistan had a bank account, and by 2021, the ownership rates reached 80.0% in India and 55.0% in Pakistan, the growth rate in India was particularly rapid between 2016 and 2017, attributed to government initiatives such as Jan Dhan Yojana,These political efforts in India contributed to accelerating the progress of financial inclusion. Despite progress in account ownership in Pakistan, there remains a gap in bank account ownership compared to India.

The increase in account ownership reflects positive trends, with both countries showing efforts toward financial inclusion. However, India's growth has been more pronounced, especially during the 2016-2017 period, thanks to government initiatives. It is worth noting that the ownership percentages may not fully capture the quality of financial services or the active usage of these accounts..

### 3.1.2 Number of Bank Branches

**Table.2. Number of Bank Branches in (India vs، Pakistan)**

| Year | *2010* | *2011* | *2012* | *2013* | *2014* | *2015* | *2016* | *2017* | *2018* | *2019* | *2020* | *2021* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| India | 63,000 | 65,000 | 68,000 | 72,000 | 76,000 | 80,000 | 84,000 | 88,000 | 92,000 | 96,000 | 100,000 | 104,000 |
| Pakistan | 12,000 | 12,500 | 13,000 | 13,500 | 14,000 | 14,500 | 15,000 | 15,500 | 16,000 | 16,500 | 17,000 | 17,500 |

**Source: Prepared by researchers based on:** (reserve bank of India, 2010-2021)**,** (state bank of Pakistan, 2010-2021)

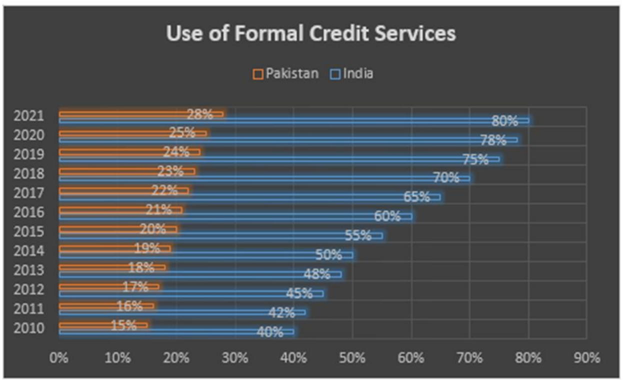
The table illustrates the number of bank branches in India and Pakistan for the years 2010 to 2021.

**In India:** The number of bank branches in India has consistently and steadily increased over the years. In 2010, there were 63,000 bank branches, and by 2021, this number had risen to 104,000, this growth reflects the expansion of the banking sector in India, the large population in India and the increasing demand for financial services could also contribute to this increase.

**In Pakistan:** Pakistan has also seen an increase in the number of bank branches, although the growth rate appears slightly slower. In 2010, there were 12,000 bank branches in Pakistan, and by 2021, the number had increased to 17,500, despite positive growth, the total number of bank branches in Pakistan is significantly lower than that in India

### 3.1.3 Use of Formal Credit Services:

**Figure.2.Use of Formal Credit Services (India vs، Pakistan)**




**Source:** (Global Findex Database, 2010-2021)

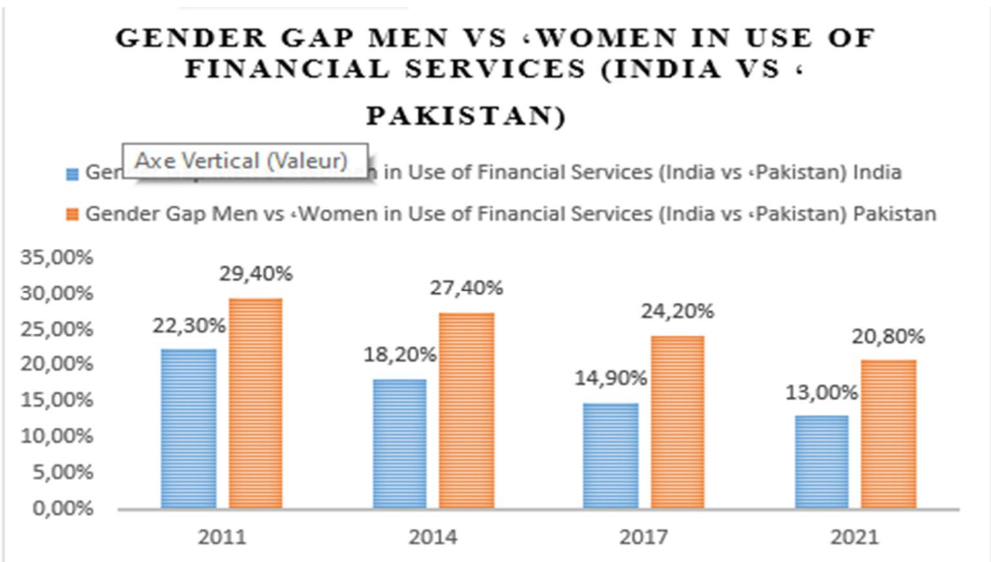
The graph presents data on the use of formal credit services in India and Pakistan from 2010 to 2021.

The percentage of individuals in India utilizing formal credit services has demonstrated a consistent and substantial increase during the study period. In 2010, 40% of the population used formal credit services, and by 2021, this percentage had surged to 80%. The steady growth points to a rising reliance on official credit services in India, reflecting a positive trend in financial inclusion driven by the country's economic development and government efforts.

Pakistan has also witnessed growth in the utilization of formal credit services, although the rate of increase is slower compared to India. In 2010, 15% of the population in Pakistan used formal credit services, and by 2021, this percentage had risen to 28%. Despite the progress made, the overall use of formal credit services in Pakistan remains lower than that in India, attributed to a slower pace of economic development and a lack of government initiatives to enhance financial literacy.

### 3.1.4 The Gender Gap:

**Figure.3. Gender Gap Men vs ‹Women in Use of Financial Services (India vs‹ Pakistan)**




**Source:** (Global Findex Database, 2010-2021)

The above graph illustrates the gender gap in the usage of financial services (India vs. Pakistan) during the period 2011-2021. The figure shows that the gender gap in financial services usage was consistently smaller in India compared to Pakistan, reflecting cultural shifts, and significantly narrowing over time in both countries due to social initiatives.

In India, the gender gap in financial services usage was 13% in 2021, down from 22.3% in 2011. This decline suggests a positive trend of decreasing disparities between men and women in accessing financial services, possibly driven by social and governmental initiatives.

Similarly, in Pakistan, the gender gap in financial services in 2021 was 20.8%, a decrease from 29.4% in 2011. This indicates a notable reduction in the gender gap over the years, likely influenced by social interventions and efforts to promote financial inclusion for women.

### 3.1.5 Development of the financial inclusion index

**Table.3.development of the financial inclusion index in India and Pakistan during the period 2010-2022(%)**

| Indicator/Index | Year | India | Pakistan |
|---|---|---|---|
| **Findex Access to Finance Score** | 2011 | 59.7 | 34.4 |
| | 2014 | 60.8 | 36.7 |
| | 2017 | 67.0 | 40.2 |
| | 2021 | 81.0 | 50.7 |
| **Findex Use of Formal and Informal Savings Score** | 2011 | 63.5 | 28.1 |
| | 2014 | 68.1 | 32.5 |
| | 2017 | 73.2 | 37.6 |
| | 2021 | 75.4 | 44.0 |
| **Microfinance Depth Index** | 2012 | 7.0 | 5.1 |
| | 2015 | 9.4 | 5.2 |
| | 2018 | 17.1 | 7.2 |
| | 2021 | N/A | N/A |
| **Findex Account Ownership (Adults 15+)** | 2011 | 35.5 | 34.2 |
| | 2014 | 48.6 | 38.0 |
| | 2017 | 67.7 | 44.6 |
| | 2021 | 80.0 | 55.0 |

**Source:** (Global Findex Database, 2010-2021)

The table provides data on the development of the financial inclusion index in India and Pakistan across different indicators from 2010 to 2022:

**Findex Access to Finance Score:** Both India and Pakistan have shown improvement in the Findex Access to Finance Score over the years, In 2011, India scored 59.7%, rising to 81% in 2021, Pakistan's score increased from 34.4% in 2011 to 50.7% in 2021, this substantial improvement in both countries indicates increased accessibility to financial services.

**Findex Use of Formal and Informal Savings Score:** Both countries exhibit an increase in the Findex Use of Formal and Informal Savings Score over the years, with India consistently outperforming, Pakistan, India's score increased from 63.5% in 2011 to 75.4% in 2021, while Pakistan's score increased from 28.1% in 2011 to 44% in 2021, the rising scores suggest enhanced utilization of both formal and informal savings mechanisms, with India leading in overall performance.

**Microfinance Depth Index:** Both India and Pakistan experienced growth in the Microfinance Depth Index, indicating increased depth and outreach of microfinance services, India's index increased from 7 in 2012 to 17.1 in 2018, Pakistan's index also showed growth from 5.1 in 2012 to 7.2 in 2018, the higher indices reflect a deeper penetration of microfinance services in both countries.

**Findex Account Ownership (Adults 15+):** Both countries demonstrated significant improvement in Findex Account Ownership over the years, In 2011, India had 35.5% account ownership, which increased to 80% in 2021, Pakistan's account ownership increased from 34.2% in 2011 to 55% in 2021, the higher percentages in 2021 indicate widespread ownership of bank accounts among adults, with India leading in account ownership.

The table showed a positive trend in financial inclusion in both India and Pakistan, with India generally performing better across various indicators. The data indicates that efforts aimed at improving access to financial services have been successful in both countries, albeit with differences in the pace and depth of progress

### 3.2 The development of digital wallets and their role in improving financial inclusion in India vs Pakistan

A digital wallet, also known as an e-wallet, is a consumer device created for the storage and management of electronic money (e-cash). It facilitates the transfer of funds from a bank account, storage of those funds within the e-wallet, and the ability to transfer specified amounts to other e-wallets ( Bleumer, 2003, p. 01), India has made significant development progress in digital wallets by adopting a Digital Public Infrastructure (DPI) approach, the Aadhaar identity layer, a key component of DPI, has dramatically enhanced access to payment and financial services since 2011, Financial inclusion has doubled, and digital payments have increased by 12% in four years. The Aadhaar infrastructure facilitates the onboarding process for financial institutions, and platforms operated by the National Payments Corporation of India (NPCI) support low-cost payment solutions. The Aadhaar Enabled Payment System (AePS) allows transactions using Aadhaar authentication, and the Aadhaar Payment Bridge enables direct government payments. The Unified Payments Interface (UPI) completes the system, facilitating instant and cost-effective payments for merchants and businesses. (Alonso, et al., 2023, pp. 19-20), Pakistan lags significantly behind India in fintech development, and the country is aiming for 65 million people to have digital accounts, including digital wallets and online banking accounts, by the end of 2023. This shift is also supported by companies adopting technology to cut costs amid challenges such as Inflation affecting the Pakistani economy ( AAMIR, 2022), the State Bank of Pakistan, in collaboration with the Department for International Development (DFID), has launched the Innovation Challenge Facility (ICF) for Digital Financial Services (DFS). This program aims to identify and promote innovative financial technology solutions to improve digital financial services in the country, and thus expand access to individuals in the low-income segment. ICF also seeks to enable market players to create innovative solutions for Pakistani consumers and businesses, and foster a customer-centric and user-friendly digital financial services ecosystem to enhance overall access and usage (state bank of pakistan , 2019), below we trace the development of digital wallets and their impact on financial inclusion in both India and Pakistan.

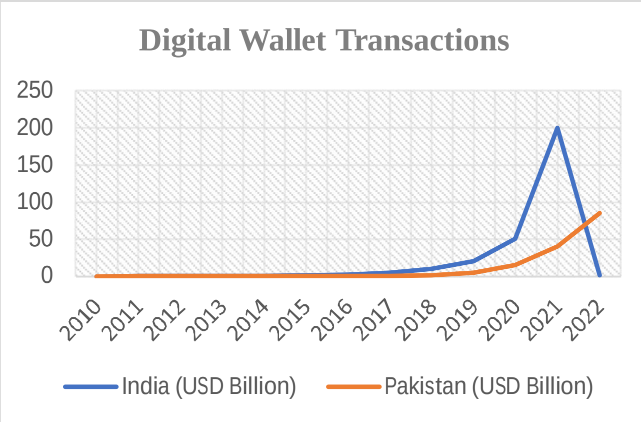
### 3.2.1 Transaction Volume:

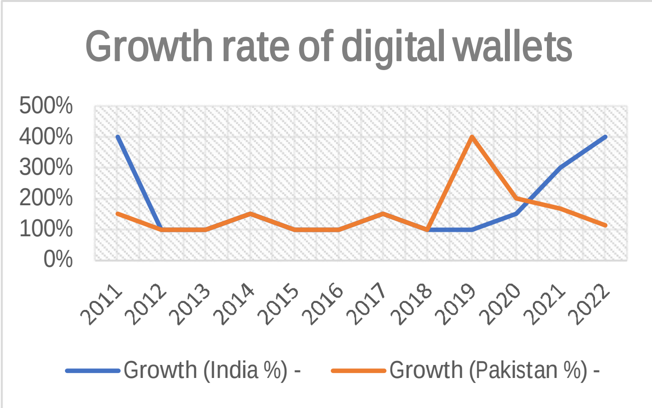
**Table.4. Evolution of Digital Wallet Transactions (2010-2022)**

| **Year** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **India(USD Billion)** | 0.01 | 0.05 | 0.1 | 0.2 | 0.5 | 1 | 2 | 5 | 10 | 20 | 50 | 200 | 1,000 |
| **Pakistan(USD Billion)** | 0.002 | 0.005 | 0.01 | 0.02 | 0.05 | 0.1 | 0.2 | 0.5 | 1 | 5 | 15 | 40 | 85 |
| **Growth (India %)** | - | 400% | 100% | 100% | 150% | 100% | 100% | 150% | 100% | 100% | 150% | 300% | 400% |
| **Growth (Pakistan %)** | - | 150% | 100% | 100% | 150% | 100% | 100% | 150% | 100% | 400% | 200% | 166% | 112% |

**Source :** (Global Findex Database, 2010-2021)

**Figure 4: Digital Wallet Transactions trend (2010-2022)**




**Source: prepared by researchers based on table 4 data.**

The table displays data on the evolution of digital wallet transactions in India and Pakistan from 2010 to 2022, along with percentage growth rates where:

**Digital wallet transactions (billion USD):** Digital wallet transactions in India have shown significant growth over the years, from 2010 to 2022 transactions increased from $0.01 billion to $1 billion. Growth rates range from 100% to 400% annually, with the highest growth being recorded in 2022. Likewise, Pakistan has seen significant growth in digital wallet transactions, from $0.002 billion in 2010, transactions have grown to $85 billion in 2022. Growth rates range between 100% and 400%, with the highest growth in 2019; The figure shows this.

**Percent growth rates:** India has consistently shown high growth rates ranging from 100% to 400% annually. Growth rates indicate rapid expansion, with the steepest increase in 2022, with transactions growing by 400%. In contrast, Pakistan has also seen significant growth, with rates ranging from 100% to 400%, and the highest growth was observed in 2019, when transactions increased by 400%; The figure shows this.

The significant growth in digital wallet transactions has been attributed to factors such as increased smartphone penetration, improved digital infrastructure, and a shift in consumer preferences towards digital payments.

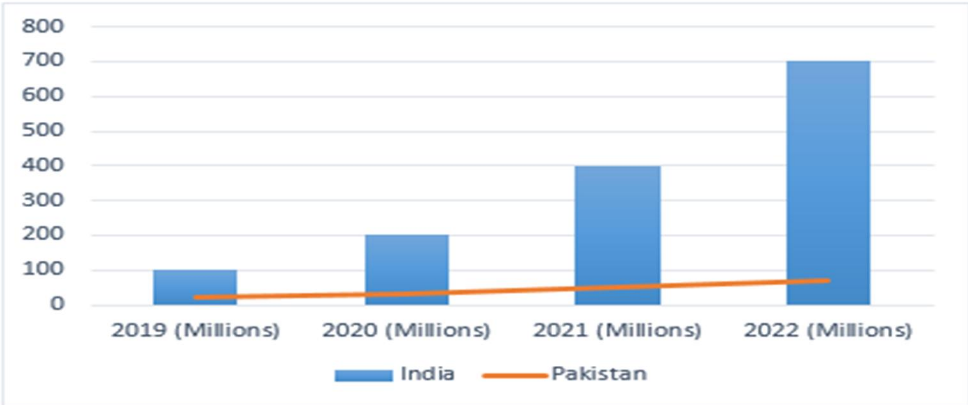
### 3.2.2 Numbr of Users:

**Table.5.Digital Wallet User Growth (2019-2022)**

| Country | 2019 (Millions) | 2020 (Millions) | 2021 (Millions) | 2022 (Millions) | Growth (2019-2022) |
|---|---|---|---|---|---|
| **India** | 100 | 200 | 400 | 700 | 700% |
| **Pakistan** | 20 | 30 | 50 | 70 | 350% |

**Source : Prepared by researchers based on** (reserve bank of India, 2010-2021)**,** (state bank of Pakistan, 2010-2021)

**Figure.5. Digital Wallet User Growth Trend (2019-2022)**



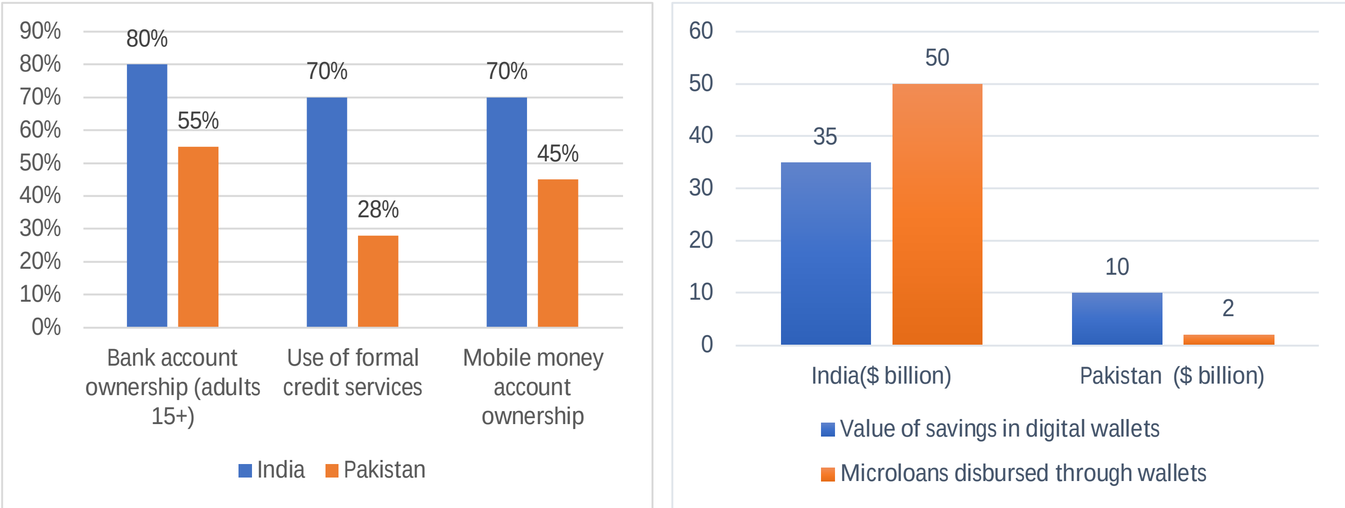

**Source: Prepared by researchers based on table 6 data**

The table illustrates the evolution of digital wallet usage in India and Pakistan from 2019 to 2022; In India, the number of digital wallet users experienced significant growth, increasing from 100 million in 2019 to 700 million in 2022. The growth rates during this period indicate a significant rise of 700%, highlighting a pronounced reliance on digital financial services, likewise, Pakistan also witnessed substantial growth in digital wallet users, rising from 20 million in 2019 to 70 million in 2022. The growth rates for Pakistan during this period were 350%, which is significantly lower than India.

This accelerated growth signifies a notable shift towards digital payment methods and an increasing acceptance of digital wallets in Pakistan. The positive impact on financial inclusion, accessibility, and the need for robust digital infrastructure to support the growing user base is evident. The graph further confirms these trends.

### 3.2.3 Impact of Digital Wallets on Financial Inclusion

**Figure.6. Impact of Digital Wallets on Financial Inclusion Indicators (2020-2022)**




**Source: Prepared by researchers based on** (world bank, 2021)**,** (GSMA Association, 2022)

**Bank account ownership (adults 15+):** Bank account ownership among adults in India is at a high level, at 80%. This indicates widespread access to traditional banking services, which can be supplemented with digital wallets, Pakistan has a lower bank account ownership rate of 55%, indicating a potential reliance on alternative financial services such as digital wallets.

**Using official credit services:** India shows a relatively high use of formal credit services, with 70% of adults accessing these services, indicating a strong credit infrastructure and financial inclusion through traditional banking channels, Pakistan uses formal credit services 28% less, highlighting potential challenges in accessing traditional credit avenues.

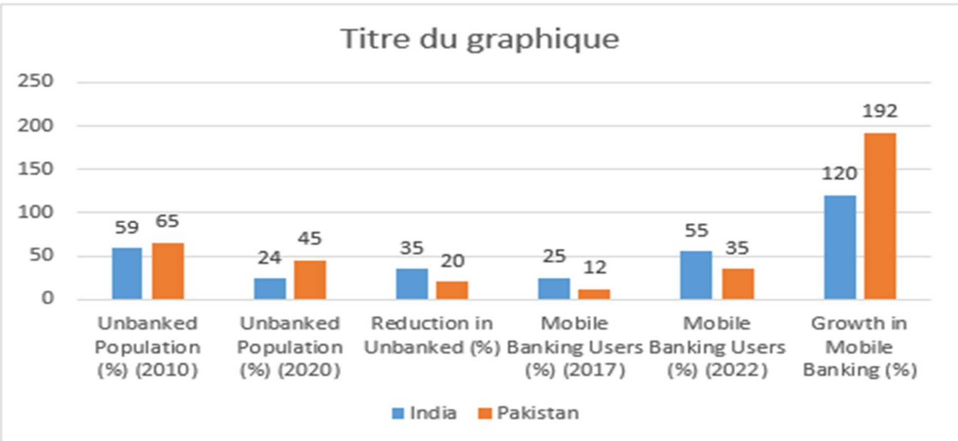
**Mobile Money account ownership:** Although bank account ownership is high in India, mobile money account ownership is also large at 70%. This indicates a significant adoption of mobile-based financial services, likely driven by digital wallets, Pakistan has a higher rate of mobile money account ownership at 45%, indicating a high reliance on mobile-based financial transactions.

**The value of saving in digital wallets:** the value of savings in digital wallets in India is large, reaching $35 billion, and this reflects a high level of trust and use of digital wallets for savings purposes, On the other hand, Pakistan also has a large value of savings in digital wallets, totaling $10 billion.

**Small loans disbursed through portfolios:** In India, microloans disbursed through digital wallets amount to a whopping $50 billion. This demonstrates the role of digital wallets in facilitating microfinance and small-scale lending, Pakistan has a smaller value for small loans disbursed through portfolios, totaling $2 billion.

The data indicates that although both India and Pakistan rely on digital wallets, there are differences in the adoption and use of traditional banking services, as India; despite having a high percentage of bank account ownership shows a high dependence on mobile money services. Mobile phones and digital wallets, which indicates a complementary relationship between traditional and digital financial services. As for Pakistan, with a low rate of bank account ownership, there is a heavy reliance on mobile phone-based financial transactions, as evidenced by the high rate of ownership of mobile money accounts.

**Figure.7. India and Pakistan's unbanked population reduction from 2010 to 2020**




**Source: Prepared by researchers based on** (Global Findex Database, 2010-2021)**,** (state bank of Pakistan, 2010-2021)**,** (reserve bank of India, 2010-2021)

graph showing decline in unbanked population in India and Pakistan from 2010 to 2020

**Unbanked Population Reduction (2010-2020):** In 2010, 59% of the population in India was unbanked, and this percentage decreased significantly to 24% by 2020. The decline in the number of unbanked residents during the decade was 35 percentage points, Pakistan began to rise the unbanked population reached 65% in 2010, then fell to 45% by 2020. The decline in the unbanked population over the decade is 20 percentage points, which demonstrates the success of financial inclusion efforts in both countries.

India has seen a greater decline in unbanked percentages than Pakistan over the period

**Growth of mobile banking users (2017-2022):** In 2017, 25% of the population in India used mobile banking, and this percentage will rise to 55% by 2022. The growth in mobile banking users over the five-year period was 120 percentage points, in 2017, 12% of the population in Pakistan used mobile banking, and this percentage will rise to 35% by 2022. The growth in mobile banking users over the five-year period was 192 percentage points, indicating increased potential. Access and accept mobile based transactions, Pakistan showed a higher growth rate, but India had a higher percentage of mobile banking users during the study period.

### 3.3 Factors for the success of India’s experience towards financial inclusion vs Pakistan’s experience:

India has achieved greater success compared to Pakistan in leveraging digital wallets to improve financial inclusion, The key factors underlying India's successes based on the given document are:

#### 1. Supportive government policies and national digital infrastructure

The document highlights that India adopted a "Digital Public Infrastructure approach", including the foundational Aadhaar digital identity system, national payment platforms, and cost-effective payment solutions facilitated by public sector leadership (Alonso, et al., 2023, pp. 19-20), this national infrastructure and policy push enabled rapid ecosystem growth.

#### 2. Rapid economic expansion enabling private sector innovation

The analysis notes that India's economic growth and thriving technology sector supported the rise of innovative private sector payment solutions like digital wallets ( Panagariya, 2022, p. 8), Fintech innovations were able to flourish.

### 3. Multiple initiatives to promote financial inclusion

The study outlines inclusive programs like the Pradhan Mantri Jan Dhan Yojana that brought unbanked and underserved groups into the formal financial system (Asif et al, 2023, p. 2), Combined with digital finance growth, financial inclusion accelerated.

In contrast, Pakistan's ecosystem faces greater challenges around underdeveloped infrastructure, regulatory gaps, and slow pace of financial inclusion initiatives compared to India (Hassnian & Rose, 2017, p. 163), while showing consistent promise, supportive policies and national infrastructure development are critical for Pakistan to reflect India's success in harnessing digital wallets for financial inclusion.

Pakistan's experience in leveraging digital finance to promote financial inclusion, while lagging India's robust progress, shows steady promise. Some key success factors evident for Pakistan based on the document include:

#### a) Private sector innovation building digital finance capacity

The analysis notes rising investment by fintech firms and telecom companies developing digital financial services in Pakistan, despite infrastructure gaps ( AAMIR, 2022), this is expanding digital capacity.

#### b) Regulatory support mechanisms such as the Innovation Challenge Fund

Pakistan's central bank has sponsored initiatives like the Innovation Challenge Fund to nurture home grown fintech innovations for financial inclusion (state bank of pakistan , 2019), this signals supportive policies.

#### c) Growing reliance on mobile money accounts beyond traditional banks

Over 45% of adults in Pakistan use mobile money accounts, indicating substantial adoption of digital financial tools compared to formal banking (Figure 6), this points to favorable consumer conditions.

#### d) Expanding agent networks to grow digital transaction touchpoints

Reports show that agent networks facilitating cash-in/cash-out digital transactions are growing steadily in Pakistan (Hassnian & Rose, 2017, p. 163), this is expanding the digital finance ecosystem reach.

While India has seen more rapid success, Pakistan's private sector developments, nascent regulatory backings, mobile money adoption trends and distribution networks display promising foundations and growth impetus to utilize digital solutions for financial inclusion. Addressing gender gaps and interoperability challenges can further aid Pakistan’s progress.

## 4. CONCLUSION

In conclusion, the journey of the digital wallet ecosystems in India and Pakistan over the past decade reflects a dynamic landscape influenced by many factors. The comparative analysis presented in this study shows the growth path and the similarities and differences between the two countries. The study reached the following results:

- India has witnessed a notable boom in digital wallet transactions, with significant growth rates attributed to the favorable regulatory environment, technological advancements, and proactive financial education initiatives, the development of India's ecosystem reflects the rapid economic growth and technological innovation witnessed in this period.
- In contrast, the digital wallet landscape in Pakistan has shown a progressive trajectory, marked by steady growth rates, emerging regulatory frameworks, and a gradual increase in consumer awareness.
- The comparative analysis revealed that in both countries there is a positive relationship between economic growth and digital wallet adoption, with an emphasis on the role of financial prosperity in promoting the appropriate ecosystem. While India saw more pronounced growth rates, Pakistan showed a steady and significant increase, indicating a gradual but promising digital transformation.
- Financial inclusion initiatives played a major role in shaping digital wallet impact. India's drives like Jan Dhan Yojana accelerated progress, while Pakistan, despite its nascent initiatives, has shown notable improvement in financial inclusion.
- The evolution of digital wallet ecosystems in India and Pakistan reflects the innovative drive and regulatory maturity towards shaping the future of digital finance in the region, promoting financial inclusion, and driving economic development.
- The evolution of digital wallets in both countries reflects innovative momentum towards advancing digital finance and inclusion, but differences in maturity indicate need for ecosystem-specific focus areas.

## 5. Bibliography List :


AAMIR, A. (2022, octobre 28). *Digital wallets, other apps drive Pakistan's fintech ambitions.* Retrieved from Nikkei Asia: https://asia.nikkei.com/

Asif, M., Naved Khan, M., Tiwari, S., Wani, S., & Alam, F. (2023). The Impact of Fintech and Digital Financial Services on Financial Inclusion in India. *Risk Financial Management*. doi: https://doi.org/10.3390/jrfm16020122

BELKACEMI, S. (2023). Financial Inclusion in Algeria and Tunisia : A Comparative Study. *human&social sciences, 9*(1).

Bleumer, G. (2003, 08 11). Electronic Wallet. *Advances in Cryptology, Proceedings of CRYPTO '83*. doi:DOI: 10.1007/978-1-4684-4730-9_28

Durai, T., & Stella, G. (2019). DIGITAL FINANCE AND ITS IMPACT ON FINANCIAL INCLUSION. *Journal of Emerging Technologies and Innovative Research (JETIR), 6*(1). Retrieved from https://mpra.ub.uni-muenchen.de/84771/

Kass-Hanna, J., Lyons, A., & Liu, F. (2021). Building financial resilience through financial and digital literacy in South Asia and Sub-Saharan Africa. *Emerging Markets Review*. doi: https://doi.org/10.1016/j.ememar.2021.100846

Panagariya, A. (2022). Digital revolution, financial infrastructure and entrepreneurship: The case of India. *Asia and the Global Economy*(2). doi:https://doi.org/10.1016/j.aglobe.2022.100027

Ramzan, M., Amin, M., & Abbas , M. (2021). How does corporate social responsibility affect financial performance, financial stability, and financial inclusion in the banking sector? Evidence from Pakistan. *Research in International Business and Finance*(55). doi:https://doi.org/10.1016/j.ribaf.2020.101314

Alonso, C., Bhojwani, T., Hanedar , E., Prihardini, D., Uña, G., & Zhabska, K. (2023). *Stacking up the Benefits: Lessons from India's digital journey.* International Monetary Fund.

Asif et al. (2023). The Impact of Fintech and Digital Financial Services on Financial Inclusion in India. *Risk Financial Management*. doi: https://doi.org/10.3390/jrfm16020122

Global Findex Database. (2010-2021). *Global Financial Inclusion.* world bank. Retrieved from https://www.worldbank.org/

GSMA Association. (2022). *State of the Industry Report on Mobile Money.* Retrieved from https://www.gsma.com/

Hassnian, A., & Rose, A. (2017, 12). Fintech and Financial Inclusion in Pakistan: An Exploratory Study. *Thematic Workshop on Enhancing Poor's Capability and Financial Inclusion From Islamic Perspective, 1*.

K. Kajol, singh, r., & paul, j. (2022). Adoption of digital financial transactions: A review of literature and future research agenda. *Technological Forecasting & Social Change*(184). doi:https://doi.org/10.1016/j.techfore.2022.121991

Koh, F., Phoon, K. F., & Ha, C. D. (2018). Digital Financial Inclusion in South East Asia. In *Handbook of Blockchain, Digital Finance, and Inclusion* (Vol. 2). Elsevier Inc. doi:DOI: 10.1016/B978-0-12-812282-2.00015-2

reserve bank of India. (2010-2021). *Annual reports.* indian. Retrieved from https://www.rbi.org.in/

SALAZAR, R. (2017). APPLE PAY & DIGITAL WALLETS IN MEXICO AND THE UNITED STATES: ILLUSION OR FINANCIAL REVOLUTION? *MEXICAN LAW REVIEW*(2). doi:DOI: http://dx.doi.org/10.22201/iij.24485306e.2017.18.10775

state bank of pakistan . (2019, juin ). *innovation challenge facility for digital financial services.* Retrieved from https://www.sbp.org.pk/Finc/Innovation.asp

state bank of Pakistan. (2010-2021). *Annual reports.* Pakistan. Retrieved from https://www.sbp.org.pk/index.html

world bank. (2021). *global findex database.* Retrieved from https://www.worldbank.org/