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Studying the Differences in Digital Transaction Adoption Rates Among the Poorest and the Rich in India

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ABSTRACT

This paper investigates differences in digital transaction adoption across wealth groups in India, using data from the 80th National Sample Survey (CMST). The study identifies substantial disparities in smartphone access, internet usage, digital skills, and online banking capabilities between the poorest and richest households. In addition to income-based differences, the analysis highlights persistent gender disparities in digital financial participation.

The findings are interpreted through the lens of overlapping structural disadvantage, where income inequality and gender-based barriers interact to shape digital access and usage. While financial inclusion policies have expanded bank account ownership, they have not translated into equitable digital participation. The results indicate that recent growth in digital payments has disproportionately benefited wealthier and male populations.

The paper concludes that improving digital inclusion in India requires policy interventions that simultaneously address affordability, digital literacy, and gender-based constraints.

Keywords

Digital Transaction Adoption; Digital Transactions; Digital Financial Inclusion; Digital Divide; Richest and Underprivileged Households; Wealth Inequality; Gender Disparities; Smartphone Ownership; Internet Access; Digital Skills; Online Banking; Unified Payments Interface (UPI); BHIM App; Pradhan Mantri Jhan-Dhan Yojana; Digital India Initiative; Demonitisation; National Sample Survey (NSS); Comprehensive Modular Survey For Telecom (CMST); Monthly Household Consumption Expenditure; Individual-level and Household-Level Indicators; Rural And Urban Areas; Digital Infrastructure, Financial Literacy; Intra-Household Dynamics; Women And Digital Payments

INTRODUCTION

The Expansion and Popularity of Digital Payments

Over the past decade, India has experienced a rapid transition towards a digital economy, with digital financial transactions becoming a central mode of exchange. Government initiatives such as Digital India and the expansion of the Unified Payments Interface (UPI) have significantly transformed financial participation and service delivery (Government of India, 2015; World Bank, 2021). Digital payments are now widely used in retail transactions, welfare distribution, and everyday economic activities.

The Problematic Nature of Digitalisation

Despite this expansion, the benefits of digitalisation have not been distributed evenly across society. Access to digital financial systems depends on more than infrastructure; it requires affordable devices, reliable connectivity, digital literacy, and financial knowledge (FHI 360, n.d.; World Bank, 2021). These requirements pose significant challenges for low-income households.

At the same time, gender disparities remain pronounced. Women are less likely than men to own smartphones, use the internet independently, and engage in digital financial transactions (World Bank, 2021; Women's World Banking, 2024). These differences persist even within higher-income households, suggesting that social norms and intra-household dynamics influence digital participation.

Aims and Objectives of the Study

The main aim of this paper is to examine differences in digital transaction adoption rates between the poorest and richest households in India. The study seeks to describe patterns in digital access, skills and device ownership across wealth groups. It will analyse how these factors could influence digital transaction adoption, and examine the role of gender in shaping adoption outcomes across income levels. Overall, the paper aims to assess whether digitalisation in India has translated into equitable financial inclusion, or whether significant gaps remain between the poor and the rich.

The remainder of the paper is organised as follows: section 2 outlines the policy and institutional background relevant to digital transaction adoption in India. Section 3 reviews the related literature. Section 4 describes the data and methodology that has been used in the analysis. Section 5 presents the main findings and the final section concludes the findings of the paper.

LITERATURE REVIEW

Policy and Institutional Background

Government initiatives have played a significant role in expanding financial access in India.

The Pradhan Mantri Jan-Dhan Yojana (PMJDY) aimed to provide universal access to banking services, particularly for low-income populations (Government of India, 2014; PMJDY, n.d.). While this initiative

significantly increased account ownership, evidence suggests that account access alone does not ensure active digital usage.

Similarly, the BHIM application and UPI infrastructure were introduced to simplify digital payments and expand accessibility (NPCI, n.d.; Business Standard, 2017). These initiatives contributed to rapid growth in digital transactions, particularly following demonetisation in 2016 (Singh, 2023).

However, infrastructure expansion has not eliminated disparities. Rural areas continue to face lower levels of connectivity and digital access compared to urban regions (Economic Times, 2025; Ookla, 2025).

Pradhan Mantri Jan-Dhan Yojana

The Pradhan Mantri Jan Dhan Yojana (PMJDY) was officially launched on 28 August, 2014. It was introduced as a national-level financial inclusion mission. PMJDY was aimed at ensuring that every Indian household, especially low-income or excluded communities, had access to the formal banking system. Additionally, every adult in India has access to essential financial services at an affordable cost. Thus, emphasising empowerment through financial access.

The initiative provides a wide range of financial services, such as zero balance accounts (that means there is no requirement to maintain a minimum balance), interest on deposits, RuPay debit card and accident insurance cover Another facility of the program includes direct benefits transfers. This refers to government subsidies and welfare payments being credited directly into PMJDY accounts.

PMJDY has illustrated impressive growth and reshaped India's financial landscape, especially for underserved communities. This was evident as within one year of launch, 19.72 crore bank accounts were opened, 16.8 crore RuPay cards were issued and 1,25,697 Bank Mitras were deployed to support account opening and access. By November 2018, a total of 330 million (33 crore) accounts had been opened. Additionally, there was a reduction in Zero balance accounts. In September 2014, 76.8% of the accounts had zero balance. By December 2015, this number had drastically dropped to 32.4%. Thus, this indicated an increased activity and trust in the banking system.

In addition, inclusion gaps were impacted due to this initiative. For instance, in 2011, only 27% of Indians from underprivileged backgrounds had bank accounts versus 41% of people from wealthy backgrounds. The gap had widened by 2014. In saying that, by 2017 it shrunk to 5%, thus reflecting strong inclusion of low-income groups. In 2014, 59% urban vs 52% rural had accounts. In contrast, by 2017, 79% rural vs 76% urban had accounts. A major factor was that 197 million out of the 330 million PMJDY accounts were opened in rural or semi-urban areas. Thus, having a bank account is not a challenge, or is decreasingly becoming one for the underserved communities. This includes low-income individuals and households in terms of performing digital transactions. In light of this, this paper does not focus on bank account ownerships. (Government of India, 2014; PMJDY, n.d.)

Bharat Interface for Money (BHIM) App

The BHIM App is a mobile payment application that is launched by the Government of India under the National Democratic Alliance (NDA) administration led by Prime Minister Narendra Modi. The app was officially launched on 30 December 2016. It is part of the broader push towards a cashless economy and digital financial inclusion. BHIM stands for Bharat Interface for Money and is based on the Unified Payments Interface (UPI) which is developed by the National Payments Corporation of India (NCPI).

The goal was to make digital transactions fast, secure and accessible to all sections of society. This would be achieved by enabling users to link their bank accounts directly, and send or receive money electronically without the need for traditional payment instruments. For instance, cards or wallet balances.

BHIM's core features are: UPI-based payments which enable bank to bank transfers, accessibility on feature phones and smartphones with options, such as UPI 123PAY for users without internet connectivity and no fees for users. As a result, within a short period of its launch, there were over 10 million downloads within the first 10 days of its launch. The biometric payment interfaces allow merchants and customers to transact by using fingerprint authentication in areas with low digital infrastructure (BHIM, n.d.).

Demonetisation

On 8th November 2016, the Government of India's decision demonetised high value notes. This was namely ₹500 and ₹1,000 banknotes in order to withdraw the legal tender status. This move was implemented by the NDA government to address structural economic issues, such as reducing corruption. It has remained one of the most significant policy steps towards reducing cash dependency in India. Thus, pushing a significant share of the population to adopt digital transactions. A significant increase in the volume of digital transactions can be attributed to this policy (Singh, 2023).

Digital India Initiative

The Digital India Initiative was launched in July 2015 with the objective of transforming India into a digitally empowered society. It focuses on three key pillars. First is digital infrastructure as a utility for every citizen. This includes reliable connectivity and access to digital services. Second, governance and services on demand, which aims to make government services accessible online and improve efficiency through digital integration. Lastly, digital empowerment of citizens. This promotes digital literacy, universal access to digital resources and inclusive participation in the digital economy (Government of India, 2015).

Digital infrastructure

Although the mentioned policies have contributed towards higher digital transaction adoption, in many rural regions, the basic infrastructure which is needed to build confidence in digital services is still missing. For instance, this was observed in a report in Ookla which stated that despite India's overall mobile penetration reaching an average of 82.74% in the first half of 2025, the gap between urban and rural areas in terms of mobile phone affordability remains wide. This report highlighted that in cities mobile penetration was extremely high at 125.3%, while rural India was far behind - with only 58.8% penetration during the same period.

Projects, such as the Bharat BroadBand Network, aim to bring fiber connectivity to all of India's nearly 625,000 villages, along with private sector initiatives. In saying that, many rural communities still do not have the internet strength that is needed to support data-heavy digital finance apps. As per Telecoms Regulatory Authority of India (TRAI), rural areas have only about 15 internet users per 100 people, compared to 71 per 100 in cities. (Economic Times, 2025; ResearchGate, 2025)

1. Ligon et al. (2019) – Small Merchant Adoption of Digital Payments (Jaipur, India)

This study uses data from the CATALYST survey to examine merchant adoption of digital payment platforms. The survey found that among merchants who have adopted digital payment platforms, most of their transactions still happen in cash. Many merchants explained that their customers prefer paying in cash, and their suppliers also expect cash, due to which sticking to a cash-based system felt easier and more practical. Moreover, the paper cited another CATALYST study that underlined that 55% of merchants who had not adopted digital payments stated that the main reason was a lack of customer demand. Thus, overall, cash continues to dominate the merchant environment and is difficult to replace.

Some merchants believe that shifting from cash to digital payments could increase their visibility to tax authorities. Vendors in Jaipur pinpointed that while they had adopted digital payments, many of them were hesitant because they feared that using a digital platform would make their income visible and result in mandatory tax payments.

2. Enabling Digital Payments for Women in India (Women's World Banking, 2024)

The study explained that many women, especially from low-income and rural households, do not view enough everyday reasons to use digital payments. Though digital services are available, cash is still preferred because financial transactions are small and irregular. The report estimated that around 200 million women in India are an "addressable market" for digital payments. This means that they have basic access but are not active users. Women described as "Fence Sitters" understand digital payments. In saying that, they do not find them useful enough to use regularly. Additionally, data costs matter, as poorer women carefully manage mobile data and avoid using it for financial apps.

Trust is another major factor. Women account for only about 25% of digital payment users in India. Thus, highlighting a large gender gap. The study found that Cautious Balancers worry about safety, losing control over money and making mistakes while using digital platforms. One failed transaction or stories

about fraud can discourage women from using digital payments. However, the study also pinpointed that support helps nearly 90% of women who received in-person assistance felt confident using digital payments.

The report explained that having a phone in the household does not always mean women can use it freely. Phones are often shared or controlled by male family members. To reduce risk, many women prefer low-risk options, such as prepaid or limited-balance accounts. When these barriers are reduced, the usage can improve. For example, the study found that about 49% of women merchants became active users, and women who adopted digital payments made around 10 transactions per month on average. This demonstrates that the main challenge is starting to use digital payments, not continuing to use them.

3. Economic Analysis and Policy (2025) – Wealth Inequality and UPI Adoption in India

This study examined the relationship between wealth inequality and the adoption of Unified Payments Interface (UPI) across Indian districts. By using district-level data, the paper analysed how differences in income distribution could influence the pace and intensity of digital payment adoption. The authors reported that districts with higher average income levels and lower poverty rates can experience significantly faster growth in UPI usage compared to poorer regions.

A key insight of the study was that the benefits of digital payment systems are not evenly distributed across the income spectrum. UPI adoption increases more strongly at higher points of the income distribution. This highlights that wealthier households and regions are better positioned to take advantage of digital payment technologies. Factors, such as greater smartphone ownership, better internet connectivity and higher digital literacy are implied mechanisms through which income facilitates adoption.

In contrast, poorer districts display much slower growth in UPI transactions. Therefore, indicating that digital payment expansion does not automatically translate into inclusion for low-income populations. The study stressed that without complementary investments in digital infrastructure, skills and affordability, digital finance may disproportionately benefit already advantaged groups. The paper concluded that unequal adoption of digital payments risks reinforcing existing economic inequalities, rather than reducing them. This is if policy interventions have failed to address these structural barriers.

4. World Bank – Global Findex 2021 (India)

The Global Findex 2021 report underlined a clear gap between account ownership and actual usage of digital financial services. Despite widespread access to bank accounts, only 35% of Indian adults reported making a digital payment in the previous year. This means that a large share of the population remains excluded from digital transactions even after entering the formal banking system.

The Findex data further illustrated that digital payment usage is strongly stratified by income. Adults belonging to the poorest 40% of households are substantially less likely to use digital payments compared to richer individuals. This illustrates that income-related constraints, such as affordability of devices, data costs and digital literacy, can continue to limit effective participation in digital finance.

Additionally, gender disparities are prominent. The report found that women in India are 13% less likely than men to use digital payments. This gender gap persists after accounting for account ownership. Thus, stressing toward deeper barriers which are related to access, autonomy and having digital skills. Overall, the World Bank concluded that income and gender remain key predictors of digital transaction use. Therefore, underscoring the need for policies that progress beyond bank account provision to promote inclusive digital adoption.

Other Potential Challenges

Local language - India's linguistic diversity is enormous. The 2016 census data has highlighted 22 major languages and around 270 mother tongue languages. Yet most digital finance services are offered only in English and sometimes in Hindi. Platforms, for instance Paytm, have expanded to 11 languages. Yet it still does not meet the needs of rural users. Additionally, about 26% of Indians are still illiterate, which creates and adds another barrier. For digital financial providers, the challenge in terms of reaching low-income and diverse markets is finding a way to build large-scale and low-margin business models which can still adapt to the specific language and communication needs of each local community.

Literacy and understanding: digital finance - Companies entering lower-income markets could still struggle with issues, such as low financial digital and general literacy. Therefore, many consumers could find it difficult to fully understand how digital financial services work. This understanding is essential in terms of keeping them safe from any potential dangers. Research has underlined that consumers view these products and services as being complex and time consuming, with extra features that feel unnecessary. Thus, making it harder to focus on the main purpose and goal. For example, simply completing a payment.

Furthermore, whilst more people own smartphones, digital payment apps can struggle to compete for storage with everyday apps, such as WhatsApp and Facebook. Additionally, in families that do not have a smartphone, it is usually the male head of the household who controls its use. Unreliable electricity can make it difficult to keep devices charged. All these barriers jointly contribute directly to lower digital transaction adoption among poorer households and women. Thus, making them central to the analysis in this study. (FHI 360, n.d.).

Overall, the literature suggests that digital financial inclusion is shaped by multiple intersecting factors. Income inequality and gender disparities interact to produce uneven outcomes, supporting the framework of overlapping structural disadvantage.

DATA AND METHODOLOGY

Surveys that are Used for Collecting Data

The National Sample Survey (NSS) that is conducted by the National Statistical Office in India is one of the country's largest sources of nationally representative socioeconomic data. It uses a repeated multi-stage stratified survey design to collect information from households across India. As part of the 80th NSS round, the Comprehensive Modular Survey for Telecom (CMST) gathers in depth data on digital access and usage. It includes detailed questions about mobile ownership, digital skills and internet use. It is measured at both household and personnel level. 34,950 households and 96,619 people were surveyed. The survey covered all usual residents, and is representative at the national, state and rural-urban levels. As it captures extensive indicators of device ownership, internet capability and digital financial literacy, the CMST is currently the most comprehensive source of data for analysing digital inclusion and digital divide in India.

In large-scale socioeconomic surveys, such as the NSS, monthly household consumption expenditure is widely used to classify households into income or wealth groups. Economists prefer consumption over income as a measure of household economic status for several important reasons. Consumption is more stable and less volatile than income due to irregular wages, temporary jobs and self-employment. Income is difficult to measure accurately in real-world surveys as incomes are not recorded, cash earnings fluctuate and people are unwilling to report exact income. This method for wealth measurement is globally accepted in development economics by World Bank poverty assessments, UNDP and global inequality research. (Government of India, NSS 80th Round, CMST)

The Connection Between Analysis and Indicators

The unit of analysis varies depending on the indicator that is being studied. Household-level indicators are used to show access to infrastructure and shared digital resources, such as internet availability at home and the presence of digitally capable members. Individual-level indicators are restricted to adults aged 18 and above. They are used to assess personal digital skills, device ownership and the ability to conduct digital financial transactions. This dual-level approach is essential because digital technologies in India can be often shared within households, and individual-level averages can mask situations where only one member, often the male, has access and/or skills.

FINDINGS AND DISCUSSION

Households are grouped into wealth quartiles based on monthly consumption expenditure - ranging from the poorest quartile (Q1) to the richest quartile (Q4). The spread across quartiles is substantial, with mean monthly household consumption increasing sharply from INR 5000 to INR 23000 from the bottom quartile to the top quartile. This wide dispersion provides a meaningful basis for studying digital inequality, as access to smartphones, internet services and digital payment platforms is closely linked to affordability, device costs and recurring data expenses.

Income Quartile	Mean	Std. Error	95% CI (Lower)	95% CI (Upper)
Q1 (Lowest)	4,893.01	16.93	4,859.82	4,926.20
Q2	8,907.27	10.52	8,886.66	8,927.88
Q3	13,248.41	15.08	13,218.85	13,277.98
Q4 (Highest)	23,447.10	111.78	23,228.00	23,666.20
Number of Observations		34,950		

Figure 1: Income quartiles and mean household incomes.

The study examined a sequence of digital inclusion outcomes which reflected increasing levels of digital engagement. At the household level, this incorporated access to the internet at home. While overall home internet access is high at approximately 87%, only 68% of households in the poorest quartile reported having internet access at home, compared to nearly 98% among the richest quartile. In addition, the CMST records reasons for non-access. Thus, illustrating that lack of digital knowledge and awareness are especially concentrated among poorer households. For example, among households reporting that they do not know how to use the internet, nearly 70% belong to the poorest quartile, while only about 2% belong to the richest quartile. Therefore, indicating that digital exclusion is driven more by skills than by infrastructure.

Income Quartile	No (%)	Yes (%)	Total (%)
Q1 (Lowest)	31.6	68.4	100
Q2	11.2	88.8	100
Q3	5.2	94.8	100
Q4 (Highest)	2.3	97.7	100
Total	12.7	87.3	100
Number of Observations		34, 950	

Figure 2: Having Internet Access at Household Level by Income Quartiles

At the individual level, the analysis begins with basic digital access. Overall, about 13% of adults report being unable to use a mobile phone. This figure rises to nearly 20% among adults in the poorest quartile, compared to about 9% in the richest quartile. Smartphone use and ownership display even sharper disparities. Recent smartphone use is reported by around 54% of adults in Q1, compared to nearly 80% in Q4, while smartphone ownership rises from approximately 45% in the poorest quartile to over 72% in the richest quartile. These differences are critical because smartphone access is a necessary condition for most digital financial services in India.

Income Quartile	No (%)	Yes (%)	Total (%)
Q1 (Lowest)	54.79	45.21	100
Q2	44.94	55.06	100
Q3	38.89	61.11	100
Q4 (Highest)	27.89	72.11	100
Total	39.61	60.39	100
Number of Observations		96,619	

Table 3: Smartphone Ownership by Income Quartiles for Ages above 18

The ability to use the internet represents a further step along the digital adoption pathway. About 46% of adults in the poorest quartile report being unable to use the internet, compared to roughly 21% among adults in the richest quartile. These skill gaps translate directly into differences in digital transaction adoption, which is treated as the key outcome variable in this study. Overall, around 49% of adults report being able to perform online banking. However, this proportion varies sharply by wealth, increasing from approximately 34% in the poorest quartile to about 60% in the richest quartile.

Panel A - Men (No. of observations = 48,559)			
Income Quartile	No (%)	Yes (%)	Total (%)
Q1 (Lowest)	54.7	45.4	100
Q2	44.5	55.5	100

Q3	37.9	62.1	100
Q4 (Highest)	28.8	71.2	100
Total	39.5	60.5	100
Panel B - Women (No. of observations = 47, 32)			
Income Quartile	No (%)	Yes (%)	Total (%)
Q1 (Lowest)	77.4	22.6	100
Q2	68.7	31.3	100
Q3	62.5	37.5	100
Q4 (Highest)	50.9	49.1	100
Total	62.9	37.1	100

Table 4: Ability to perform Online Banking by Income Quartiles and Gender for Ages above 18

Gender is incorporated as a central dimension of analysis, given well-documented gender gaps in technology use and financial inclusion in India. People can aim to observe the differences in adoption rates by both gender and wealth quartiles. That means:

$\text{Change in gender gap} = (\text{Gap in Q4}) - (\text{Gap in Q1})$. This metric should capture whether gender gaps narrow or widen with increase in income.

Firstly, it can be witnessed that across the adult population, around 60% of men report being able to perform online banking, compared to only 37% of women. Therefore, gender gaps are evident across all stages of digital adoption, including smartphone ownership and internet use. Importantly, these disparities persist within various wealth groups. In the poorest quartile, approximately 45% of men are able to perform online banking, compared to just 23% of women. In the richest quartile, where adoption levels are much higher overall, only about 49% of women report being able to conduct online banking, compared to over 71% of men. The change in gender gap in this context is -0.7 percentage points. Thus, highlighting that higher household wealth does not fully offset gender-based digital exclusion. The paper estimates that the change in gender gaps across smartphone ownership and ability to use the internet and observe that are -9.2 and -8.8 respectively. Thus, stressing that gender gaps are relatively narrow, with respect to smartphone and internet usage. However, it is less elastic as far as online banking is concerned.

To better capture digital exclusion at the household level, individual responses are aggregated to identify households where no adult is digitally capable. This reveals stark inequalities that are not visible in individual-level averages. Approximately 34% of households in the poorest quartile have no adult

smartphone user at all, compared to about 2% in the richest quartile. Similarly, only around 49% of poorest households contain at least one adult capable of performing online banking, compared to roughly 90% of households in the richest quartile. In addition, richer households have a substantially higher average number of digitally skilled adults. Thus, reinforcing within-household learning and usage spillovers.

CONCLUSION

This paper examined the gap in digital transaction adoption between India's poorest and wealthiest households, by using data from the 80th NSS round (CMST). The evidence pointed to a massive 'wealth gradient' at every step. This includes from who owns a phone and has internet access to who actually has the skills to manage a bank account online. Essentially, while India has built the pipes (the infrastructure), the actual use of those systems is still deeply unequal.

The findings have confirmed the study's main point: digital inclusion is not just about access. It is about wealth and gender. Programs, such as PMJDY, have made bank accounts nearly universal. In saying that, it has not translated into digital use for the poor. Even when they have a phone or a connection, aspects, such as cost, lack of technology skills and household dynamics are factors that hinder the use of digital transactions. . In wealthy homes, multiple people can navigate the digital world, creating a learning spillover. Whereas, a poor household might rely on just one person to figure everything out in terms of making digital transactions.

A key finding is that digitalisation does not automatically help everyone equally. Without receiving specific help for people who are at the bottom, these systems can actually make existing social and economic divisions worse. In addition, gender plays a huge role in such scenarios. Women are consistently less likely than men to own smartphones and/or use the internet. These gaps do not disappear if and when a family gets richer. Social norms and who 'controls' the devices in the house remain major hurdles.

Overall, the research demonstrates that India's digital shift has disproportionately favoured men and the wealthy. It is a reminder that building infrastructure and opening bank accounts is only winning half the battle. To make things truly fair, policy needs to focus on digital literacy, making data affordable, building trust in the system and breaking down gender barriers. This matters for everyone: from government officials to service providers. As areas, such as healthcare and public services become digital, failing to close these gaps means that the most vulnerable people could lose access to receiving and benefitting from essential services.

Looking ahead, future researchers should track whether these gaps are actually narrowing over time and if specific policies, such as local-language interfaces or literacy programs, are working effectively. The ultimate question is whether digital tools will eventually benefit the whole family, or keep reinforcing the same old unfairness and inequalities? India has built a world-class digital ecosystem. However, making sure that everyone can actually use it remains a work in progress.

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