



Gender Inclusivity of India's Digital Financial Revolution for Attainment of SDGs: Macro Achievements and the Micro Experiences of Targeted Initiatives

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Abstract

For decades, India has led the drive for financial inclusion of poor rural women to facilitate attainment of development objectives like poverty alleviation and women's empowerment. More recently, it has promoted digital financial inclusion to further its fight against poverty and gender inequality and support the attainment of UN's Sustainable Development Goals (SDGs). In this paper we take stock of how India's digital financial revolution has affected financial transactions and services with a focus on gender inclusivity for the attainment of the SDGs. We propose a framework to understand the gender inclusivity of digital financial inclusion initiatives that connects the macro developments in the sector with the micro-level experiences of improving women's access and use of these services. We draw on India's nationwide developments and present a case study of an initiative that specifically promotes gender inclusive finance. Our findings suggest that India has made great advances in promoting digital financial inclusion but at the same time, the country has struggled to achieve gender parity even within specific finance-focused programmes designed to improve gender inclusivity. We reflect on policy implications of these findings.

Keywords Digital financial inclusion · Sustainable development goals · Gender equality · India

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Résumé

Pendant des décennies, l'Inde s'est positionnée en tête de l'élan en faveur de l'inclusion financière des femmes rurales vivant dans la pauvreté, dans le but d'atteindre des objectifs de développement tels que la réduction de la pauvreté et l'autonomisation des femmes. Plus récemment, le pays a promu l'inclusion financière numérique pour poursuivre sa lutte contre la pauvreté et l'inégalité entre les sexes et soutenir la réalisation des objectifs de développement durable (ODD) des Nations Unies. Dans cet article, nous faisons le point sur la façon dont la révolution financière numérique de l'Inde a affecté les transactions et les services financiers en mettant l'accent sur l'inclusion du genre pour la réalisation des ODD. Nous proposons un cadre pour comprendre l'inclusion de l'approche genre dans les initiatives d'inclusion financière numérique qui relie les développements macro dans le secteur avec les expériences au niveau micro de l'amélioration de l'accès et de l'utilisation de ces services par les femmes. Nous nous appuyons sur les développements à l'échelle nationale en Inde et présentons une étude de cas d'une initiative qui promeut spécifiquement la finance inclusive. Nos résultats suggèrent que l'Inde a fait de grands progrès dans la promotion de l'inclusion financière numérique, mais qu'en même temps, le pays a eu du mal à atteindre la parité entre les sexes, même dans le cadre de programmes spécifiques axés sur la finance conçus pour améliorer l'inclusion des femmes. Nous menons une réflexion quant aux implications politiques de ces résultats.

JEL Classification G21 · G53 · O16 · O53

Introduction

India's microfinance programmes are well-known across the globe with regard to achieving financial inclusion and generating livelihood activities for women living in low-income households (Kumar et al. 2021; Kochar et al. 2022). India has in the last few years moved towards digital financial inclusion by promoting a national biometric identity programme together with an open access digital financial transactions infrastructure; this created the foundations upon which both public and private digital financial inclusion activities could be launched. This evident drive towards digitisation is making India one of the largest and fastest growing markets for digital services presenting the country with an opportunity to transform financial inclusion through digital financial services. In this paper, we examine digital financial inclusion in relation to women in India and the particular challenges they may face in accessing and using digital financial services. Understanding the factors that may enable or constrain women in accessing digital financial services is important in order to enable gender-inclusive digital financial inclusion. Women currently have disproportionately less access to both finance and digital technologies. Ensuring that digital financial inclusion is gender inclusive can therefore help achieve the



Sustainable Development Goals (SDGs), in particular SDG 1 (no poverty), 5 (gender equality) and 8 (decent work and economic growth).¹

The government of India has consciously laid down the foundations for a national digital finance infrastructure to enable the country to leapfrog to the next generation of digital financial inclusion. It provided three critical digital finance enablers to encourage what is being termed as a digital financial revolution (Maiti et al. 2020). First, Aadhaar, a national biometrics digital identity programme, which provides every Indian with a unique digital identity (Rao and Nair 2019). Second, Pradhan Mantri Jan Dhan Yojana, a financial inclusion programme, that uses Aadhaar to inexpensively open millions of new bank accounts (Kumar and Pathak 2022). Third, rapid growth in mobile phone penetration has propelled access to digital finance. Thus, the government could outperform more traditional models of access to finance by linking bank accounts to biometric identification and to mobile phone numbers (Sherline 2016, p.18). In addition, the Government of India has created a new digital payment infrastructure (e.g., the Unified Payment Interface (UPI)) to enable digital payments through mobile phones, and it set up new types of banks (e.g., Payment Banks)—we discuss these developments in more detail in Sect. "Policy and Infrastructure Enablers of Digital Financial Inclusion in India".

In the last several years, two sudden shocks have further boosted the uptake of digital financial services. The first was demonetisation in November 2016, which overnight, resulted in invalidating over 86% of India's total currency in circulation, accelerating the uptake of digital payments in India (Ghosh et al. 2017). A further boost to digital payments was provided by the exogenous shock of COVID-19 which resulted in extended and repeated lockdowns (from March 2020 onwards, see Ray and Subramanian 2022). These developments further contributed to a push towards digitising access to services, including access to finance, for citizens across the income spectrum.

However, while digitisation is increasing, there is a clear gender gap in access to digital services, including access to digital financial services. Women face dual constraints of limited access to financial services, which is considered a male domain, as well as limited access to digital technology, which is again a male domain (Sorgner and Krieger-Boden 2017; Molinier 2019; Mariscal et al. 2019). Recent studies on mobile phones, the main avenue for accessing digital services in India, show that women in India have significantly lower access and use of mobile phones compared to men (GSMA 2022). This suggests that women's access to digital financial services and thus digital financial inclusion, may be hindered by factors related to digital technology.

In this paper, we examine whether India's digital financial inclusion movement succeeds in promoting gender inclusivity. We define gender inclusivity as enabling women to access and use the financial instruments that are available to men in similar socio-economic situations. Through a multi-level framework, we connect the macro-level perspective on digital financial inclusion policy and infrastructure with the micro-level view on women's experiences of using finance through a case study

¹ <https://sdgs.un.org/goals>.



of a financial inclusion initiative, the business correspondent model (BCM). The paper is organised as follows. We begin with a review of evidence of the impact of digital financial inclusion in Africa and India to provide a contextual backdrop for better understanding the potential for digital financial inclusion in attainment of the SDGs and to inform our conceptual framework. Sect. "[Analytical Framework and Study Methodology](#)" presents our framework as a way to understand factors influencing women's ability to engage with digital financial inclusion. It also details the study methodology and the secondary data sources we are drawing on. Sect. "[Policy and Infrastructure Enablers of Digital Financial Inclusion in India](#)" describes the macro-level enablers driving digital financial inclusion in India while Sect. "[Case Study: The Business Correspondent Model and Women](#)" discusses the BCM as a case study for illustrating gender dimensions of digital financial inclusion, as well as teasing out challenges. Sect. "[Discussion](#)" discusses the framework in view of Sects. "[Policy and Infrastructure Enablers of Digital Financial Inclusion in India](#)" and "[Case Study: The Business Correspondent Model and Women](#)". The final section provides concluding comments and reflections on policy implications of gender inclusive digital financial inclusion initiatives.

Digital Financial Inclusion and Gender Inclusivity: Experiences from the Global South

Digital financial services (DFS), in particular mobile payments, have purportedly become an effective strategy in promoting and enabling digital financial inclusion in the Global South (McKinsey Global Institute [2016](#)). DFS encompass a wealth of products, notably mobile payments (e.g., mobile wallets and stand-alone payments) but also increasingly digital credit, savings and insurance (e.g., health, crop, weather and life insurance) products. It is argued that DFS are easily scalable and low in transactions costs (Donovan [2012](#)), thus appealing to the poor while appealing to the development sector with the potential to reduce poverty and foster local economic development (McKinsey Global Institute [2016](#)).

Evidence on Digital Financial Inclusion and Women

To better understand the potential of digital financial inclusion in India, we need to revisit the experience of Sub-Saharan Africa first where DFS have risen tremendously. Kenya, as one of the early adopters of digital finance spearheaded by M-PESA's inception in 2007, reports that by 2017, approximately 37 million mobile wallet accounts existed, this translates into a 73% mobile money account ownership among the adult population (IFC [2018](#)). Kenya's experience has inspired other countries to follow suit in providing mobile money accounts and facilitating mobile payments, e.g., notable providers in Nigeria are Paystack and Paga as well as WIZ-ZIT in South Africa but there are many more (Sy et al [2019](#)). Beyond mobile payments, other digital products have risen in popularity more recently, especially digital credit. A survey conducted by FSD Kenya in 2018 found that 13.6% of all adults



have had a digital credit product, six years after digital credit products came to the fore in 2012 with the launch of M-Shwari (FSD Kenya 2019).

DFS promises to increase savings, labour force participation and to ease business operations among other things (e.g., Demirgüç-Kunt et al. 2020; Klapper et al. 2019). However, evidence suggests that the impact of DFS is rather mixed. Given Kenya's role in shaping the digital financial inclusion landscape, much of the initial impact evidence has been focused on M-PESA. A study by Suri and Jack (2016) claims that M-PESA had a positive impact on poverty reduction by lifting 2% of Kenyan households out of poverty. However, these claims have been debunked by Bateman et al (2019) concluding that Suri and Jack's work "does not stand up to scrutiny" (p. 489–490). There is evidence that suggests that digital borrowing is overheating; putting borrowers at risk in terms of default, financial distress, and debt dependence (e.g., see Izaguirre et al. 2018 on Tanzania and related CGAP blog series²). None of this is surprising and similar arguments have been put forward in the broader context of financial inclusion where borrowers resorted to "distress and opportunity driven" borrowing (Jain and Pegu 2009, p. 28; Mia 2017) to avoid default. Likewise, an evidence gap map by Finance in Digital Africa³ suggests that the impact evidence on digital financial inclusion is thin focusing on mobile money and payment interventions suggesting mixed results (see also Duvendack and Mader 2020).

Women are seen to be particularly affected by the downsides of DFS as outlined by Gammage et al (2017) in their systematic review examining gender and digital financial inclusion. They conclude that despite significant investments in growing digital finance initiatives, women persistently face barriers to accessing and using DFS. e.g., there is a gender gap in national identity cards which in many countries are needed to obtain mobile phones and or register for services, women are more likely to be illiterate which hampers their use of DFS apps which require certain levels of literacy; finally, women are less likely to own phones and are thus excluded from accessing and using DFS (Gammage et al. 2017; Lee et al. 2021; GSMA 2022). On the point of literacy, Johnson (2004) argues that being a young, educated male raises the likelihood of borrowing suggesting that access to and use of finance is gendered. This implies that social norms relating to gender present barriers to entry for women to fully benefit from financial institutions and markets (Johnson 2004). Social norms thus become an important consideration when designing gender inclusive DFS initiatives.

Women's Access to Digital Technology

As we have seen above, the bulk of the evidence base centres on the Sub-Saharan experience with a focus on M-PESA not yet engaging much with women's access and use of mobile phones which is surprising given the more general discourse in

² <https://www.cgap.org/topics/collections/digital-credit>.

³ <https://egm.financedigitalafrica.org/>.



relation to financial inclusion is very women's focused. What is apparent from the literature on South Asia, though, is that women have the lowest access to phones in the region, especially when compared to men (GSMA 2020, 2021, 2022; Lirne Asia 2019). In their 2022 report, the GSMA emphasises that the gender gap in relation to owning mobile phones and accessing mobile internet has remained flat, especially in South Asia. If women have access to a phone, then this is commonly owned by a male member of the household and also primarily used by the men in the family (Barboni et al. 2018; GSMA 2020, 2021, 2022; Tenhunen 2018), and should they own a phone, then this tends to be an older or cheaper model with fewer features (Wyche et al. 2016; Barboni et al. 2018). Additionally, studies show that there is a gender gap in the use of mobile phones, and that this gap increases the more sophisticated the task (GSMA 2022; Lirne Asia 2019; Barboni et al. 2018).

In the South Asian context, mobile phone access and use by women is further complicated due to notions of honour and purity, which are associated with gendered social norms (Barboni et al. 2018; Kovacs 2017). Women are often expected to use phones primarily at home as not to arise suspicion. Their use of phones is also more likely to be monitored and supervised (Barboni 2018; Kovacs 2017). There clearly is a gendered pattern of mobile phone use in the South Asian context. These social restrictions on women's ability to use mobile phone devices likely hamper their access to and use of DFS. This is because the mobile phone is the primary tool through which the majority of Indians, and especially low-income individuals, access digital services and online information in India.

Overall, the review of the literature finds limited evidence that digital financial inclusion is enabling poverty alleviation and promotes the attainment of the SDGs. However, it makes it clear that there are few studies on the topic, and especially few studies on the experiences of low-income women and their journey towards achieving digital financial inclusion. This is especially the case in India where to our knowledge, no studies have exclusively focussed on gender and digital financial inclusion. To understand the complexity of gender dimensions with respect to digital financial inclusion, we propose a conceptual framework that facilitates the study of gender inclusivity of DFS initiatives—as described in the next section.

Analytical Framework and Study Methodology

This section first develops a framework to better understand the factors affecting women's access to and use of digital financial inclusion initiatives, before outlining the methodology guiding the remainder of this paper.

Analytical Framework

The framework we present allows us to identify factors that enable or constrain gender inclusiveness of digital financial inclusion initiatives. We draw on and adapt the framework provided by Mahmudiono et al. (2019) to study factors affecting child malnutrition. This framework in turn draws on the ecological systems model, first



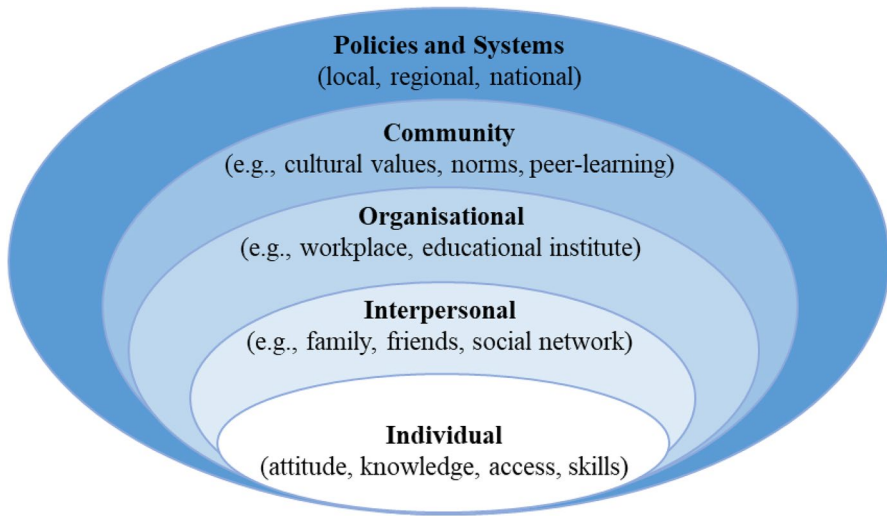


Fig. 1 Framework: Factors affecting women's digital financial inclusion. *Source* Adapting Mahmudiono et al. (2019), drawing on Bronfenbrenner's (1995) Ecological System's Theory to Study DFS Gender Inclusivity in Developing Countries

developed by Bronfenbrenner (Bronfenbrenner 1995; Bronfenbrenner and Evans 2000), and later widely adapted to the study of development interventions, especially in the educational and health sectors (see Langford et al. 2014; Eriksson et al. 2018; Mahmudiono et al. 2019).

As shown by our review of the literature, low-income women in India are faced with a number of factors that affect their access to digital finance. These factors, if grouped, correspond well to the framework developed by Mahmudiono et al. (2019) drawing on Bronfenbrenner (1995). We adapt the framework to consider five different levels of factors within a system that influence women's ability to engage with digital financial inclusion. While the original framework is not gender-focussed, our framework focusses specifically on factors at various levels of the system that affect women's ability to access and use digital finance.⁴ Using an ecological systems framework allows us to show the various kinds of complex factors that often interlink across multiple levels from macro-level to micro-level.

Figure 1 illustrates our framework and the five levels of factors that may enable or constrain low-income women's use of digital finance in countries such as India. At the first level, the individual woman has several personal attributes related to the uptake and use of digital finance. Individual-level factors include attitudes towards digital services, knowledge of access and services, ability and confidence to access digital devices and related technology and digital and non-digital skills to use these effectively. The second level of interpersonal

⁴ Note that this framework may be adapted to understand inclusivity in digital financial services in general, but here we adapt it to the analysis of gender inclusivity more specifically.



relationships represents direct influences or interactions between individuals. Related to women's access to digital finance, interpersonal factors include support from family, friends and the immediate environment—the woman's social network. At the third level, the organisational level, factors include the influence from a woman's workplace, educational institution or other place of engagement such as engaging with women peers through women's groups (e.g., self-help groups), or engagement with non-governmental organisation (NGO) staff, or bank staff. At the fourth level, the community factors include cultural values and social norms surrounding the use of digital technology and the use of finance by women. At the fifth and final systems level, macro-level policies and infrastructure influence the system as a whole, and thus provide a conducive environment for economic development, innovation and spread of technology. These macro-level factors influence organisational and individual behaviour.

This framework allows us to explore the various complex factors that impact women's access to and use of digital financial inclusion initiatives within the larger system. The framework, proposed here, considers the entire system, or ecology, surrounding the digitisation of financial inclusion, thus bringing together five levels of factors from the individual to the macro level. This framework acknowledges that while the policy and infrastructure factors are critical, in countries where gender norms are likely to restrict women's mobility and agency, interpersonal relations and community environment are equally important in determining women's inclusion in the digitalisation of financial services (see Sorgner and Krieger-Boden 2017; Molinier 2019).

Methodology

The framework outlined above becomes the basis for our methodology as well as our analysis. We draw on secondary data sources, including academic literature, publicly available statistics, and grey literature for our review of macro-level policies and infrastructure. Sects. "Policy and Infrastructure Enablers of Digital Financial Inclusion in India" to "Discussion" test the framework as follows: We begin with a review of the macro-level policy and infrastructure enablers for digital financial inclusion (Sect. "Policy and Infrastructure Enablers of Digital Financial Inclusion in India"). We then focus on the micro-level by providing a case study focusing on a particular digital financial inclusion initiative: the BCM (Sect. "Case Study: The Business Correspondent Model and Women"). The case study is also based on secondary data sources focusing largely on reputable newspaper articles due to a lack of published papers and reports on the topic. While we acknowledge the limitations of relying on such grey literature evidence, it allows us to consider up to date individual, organisational and community level factors influencing women's access to digital financial inclusion. Thereafter, Sect. "Discussion" brings all the arguments together by discussing the framework in view of the insights gained from the macro-level review and the micro-level case study.



Policy and Infrastructure Enablers of Digital Financial Inclusion in India

This section sets the context to India's digital financial inclusion revolution by detailing the macro-level policies as well as the infrastructure that has been put in place in the last decade to facilitate this revolution. Despite a mammoth banking infrastructure that reaches nearly every corner of the vast country, India has struggled with achieving high levels of financial inclusion, especially among its poor and underprivileged households. In 2010, for instance, nearly 65% of the country's adult population lacked even a basic bank account. While there were many reasons for this, prominent was the lack of proof of identification. All this changed in the last few years because of the rapid evolution of digitisation together with the roll-out of national ID cards and bank accounts for all.

JAM Trinity

The three pillars that have spurred digital financial inclusion over the last decade are commonly referred to as the *JAM trinity*, an acronym representing Jan Dhan Yojana bank accounts, the Aadhaar ID programme, and Mobile technology penetration (Ravi 2018). Below we discuss, in turn, Aadhaar, Jan Dhan Yojana, and lastly the mobile phone revolution.

Launched in January 2009, Aadhaar is a national biometrics digital identity programme issued by a central government agency (Unique Identification Authority of India) to all Indian residents and citizens. The unique 12-digit identity number is linked to demographics and biometrics (fingerprints and iris scans). With 1.326 billion identity cards issued as of April 2022, Aadhaar covers almost 100% of India's population (Aadhaar, Dashboard, accessed on 06/04/2022). It serves as proof of identity and address across a range of public and private services platforms offline and online anywhere in the country, allowing verification of a person's identity in real time, without relying on paper evidence (Rao and Nair 2019).

In August 2014 as the Government of India introduced Pradhan Mantri's Jan Dhan Yojana (PMJDY), to open bank accounts for underserved sections of the population. PMJDY facilitates entry for poor and underprivileged residents, including women, into the formal banking system by using as Aadhaar for Know Your Customer (KYC) authentication to open a bank account.⁵ As of April 2022, a total of 450 million new accounts had been opened under this scheme (PMJDY Progress Report 2022). Using Aadhaar has been instrumental and reduced the cost of account opening from USD 15 to USD 1. Government policy has explicitly prioritised access to the banking system as an instrument for improving financial inclusion, reducing poverty and increase inclusive growth. To accomplish this as rapidly as possible, the government has heavily relied on technological innovations. It was hoped that the

⁵ In 2010, financial inclusion was still a major challenge in India, with 2/3rd of its adult population lacking even a basic bank account. While there were many reasons for this, prominent was the lack of proof of identification, obtaining which was a considerable expense.



Table 1 Account ownership by gender in India overtime

Year	Account, female (% age 15+)	Account, male (% age 15+)
2011	26%	44%
2014	43%	63%
2017	77%	83%
2021	78%	78%

Source Global Findex Database (2021). Shaded area represents the start of the PM's Jan Dhan Yojana

PMJDY programme would greatly improve efficiency in targeting and direct delivery of government grants and subsidies in India. Year-on-year, these bank accounts have become the default mode for direct delivery of government benefit transfers (Kumar and Pathak 2022). For instance, Jeevan Pramaan, a pension scheme for senior citizens, directly transfers payments to beneficiaries to Aadhaar-authenticated bank accounts. Digitisation enabled it to experience significant growth in a short period of time, e.g., from 1.65 million registered in 2016 to 459.5 million as of 15th July 2022 (PMJDY website).

PMJDY has enjoyed huge success in term of gender reach and has been credited with closing the gender gap in account ownership. According to the Global Findex Database (2021), in 2014 just before Jan Dhan was introduced, only 43% of all women in India owned a bank account, this has since grown to 78% of women in 2021 (Table 1). In the same period, the total number of men owning accounts has increased from 63 to 78%, respectively.

Nearly all the new accounts opened after 2014 are attributable to PMJDY, of which 55% accounts are owned by women (Women's World Banking 2021). However, it should be noted that in spite of the many benefits of the PMJDY programme, initial data showed that 43% of all PMJDY bank accounts were dormant and many others had negligible balances (Patwardhan 2018).

The biggest impetus for India's digital services came from the dramatic increase in mobile phone penetration and digital access through mobile phones, in recent years. Data from GSMA (2022) shows that there were 1.14 billion mobile phone connections in India in January 2022. Accounting for multiple phone ownerships, they estimate this to be equivalent to 81.3% population coverage. Internet usage is also growing at a fast pace. According to Digital 2022 India Report, India's internet penetration rate stood at 47% of the total population at the start of 2022. Most of this increase is recent, for instance, between 2021 and 2022 alone, internet users in India increased by 34 million. Estimates suggest that India is likely to reach 90% coverage by 2028 (ibid.). A lot of these gains are attributed to the introduction of JioPhone, a Long-Term Evolution (LTE)-enabled phone launched by the leading Indian operator Reliance Jio and available for under \$10. Over 110 million of these devices were sold by 2021 since its launch in 2017, providing an affordable entry point for many first-time internet users in India. The low cost helps in particular to address the affordability barrier that disproportionately affects women's access to the internet.



Table 2 Mobile phone ownership, type of handset and mobile internet use by gender in India

Description	Year	Female (% age 15+) (%)	Male (% age 15+) (%)
Mobile phone ownership	2019	63	79
	2020	67	79
	2021	71	83
Ownership of smartphone	2019	14	37
	2020	25	41
	2021	26	49
Mobile internet user	2019	21	42
	2020	30	45
	2021	30	51

Source GSMA Mobile Gender Gap Reports (2020, 2021, 2022)

However, as highlighted in Table 2, there is a significant gap in access to and use of mobile phones by men and women. Data from the GSMA's Mobile Gender Gap Reports (various years) suggest that the gender gap in mobile phone ownership and usage in India fell rapidly following COVID-19, but this trend has slowed since, with some indication of the gap widening for some indicators.

The difference in mobile phone ownership between women and men fell from 16% in 2019 to 12% in 2020 and 2021 (although the actual percentage of men and women owning phones continued to increase). The differences in the ownership of smartphones fell even more dramatically from 23% in 2019 to 16% in 2020 but rose substantially back to 23% mainly because male ownership of these more expensive devices continued to increase while female ownership stagnated. The gender differences in the use of mobile internet reflects a similar trend, falling from 21% in 2019 to 15% in 2020 but increasing back to 21% a year later. According to GSMA (2022), India has one of the worst gender gaps in both mobile ownership and use in the Global South. The growth in women's mobile ownership has slowed considerably, which makes closure of the gender gap unlikely in the near future (GSMA 2022). This lack of progress in access and use of mobile internet among women will have implications for if and how DFS will be adopted and used.

Digital Finance Infrastructure

The government has invested in digital finance infrastructure to spur both technological innovation and financial inclusion. Rapid increases in mobile phone ownership paved the way for the recent take-off experienced by the Unified Payments Interface (UPI) which was introduced in 2016. UPI is a system that empowers multiple bank accounts into a single mobile application (of participating banks), merging several banking features, merchant payments and seamless fund routing via a single payment API (Application Programme Interface). It also facilitates peer-to-peer collection request which can be scheduled and paid as needed). Administered by the Reserve Bank of India (RBI), UPI works like a financial scaffolding that uses Aadhaar, mobile number, account number and address in a unified way to facilitate



the next generation online immediate payments leveraging increase in smartphone adoption and app downloads, regional language interfaces, and improved access to internet and data. This national mobile payment network has experienced modest growth in its first year, but then grew at around 450% year-on-year, accounting for over 50% of all recorded retail payments in India by November 2021, just five years from its inception. The latest figures from the RBI stand testimony to its rapid growth, with monthly transactions worth INR 462 billion (around USD 6.10 billion) in January 2022 (RBI Bulletin, March 2022).

A second digital finance technology the government has invested in is the Aadhaar-enabled payment system (AePS), which enables agents such as the business correspondents discussed in the next section, to process account openings and basic banking services such as transfers, deposits and withdrawals, and undertaking Aadhaar-based biometric identification to verify customers and approve service requests on a portable device (Pinto and Arora 2021). The APIs of the digital finance infrastructure detailed above are, importantly, open source to ensure interoperability, thus encouraging innovation in digital finance by enabling different technology operators to link their services to UPI and AePS.

Finally, the introduction of new banks is another large infrastructure investment by the Indian government. In November 2017, so-called Payment Banks, were established aimed at bringing niche, non-traditional companies and organisations, such as telecoms companies, fintech start-ups, industrialists and the postal service, into the formal banking sector to leverage their existing networks to expand digital financial inclusion through payments and small savings. Services were to be targeted at under-served groups such as low-income households, women, migrant workers, and micro and small businesses. Payment Banks can facilitate digital payments and collect savings and remittances up to 100,000 INR (around 1400 USD) but cannot lend (RBI 2022).

Together, the new payment systems, the new Payment Banks, and the JAM Trinity underpin digital financial inclusion activities in India. Having described the macro-level context by reviewing recent changes in India's digital finance infrastructure and policy, we now present a micro-level perspective through the lens of women banking agents and their female customers.

Case Study: The Business Correspondent Model and Women

In India today, there are a number of ways in which technology is used to deepen digital financial inclusion. These include for example government direct benefit transfers as discussed in the previous section. It includes microfinance models that use technology to provide services.⁶ Likewise, there are banks that work specifically with low-income communities, and digital financial inclusion start-ups offering

⁶ Technologies include Aadhaar and video linked authentication, automation of the customer onboarding process through digital means, and loan disbursements and repayments via the Aadhaar enabled UPI (KPMG 2021).



loans, insurance and savings products to low-income individuals. There are also payment applications such as *PayTM*, *GooglePay*, and *PhonePe*, that, while not focussed on low-income individuals, have become widely used by everyone including poor individuals with access to bank accounts and a smartphone. A review of all these modes of expanding financial inclusion are out of scope for this paper, instead we chose to study the BCM, an initiative that links the banking system, the women's self-help groups that microfinance often works and the technology that is used to provide financial inclusion activities in the rural areas. The BCM aims to facilitate access to financial services in rural areas drawing on agents that partner with traditional banks. Most of these agents tend to be male, however, this changed when NABARD stepped in to extend their self-help group (SHG) model to include more women as we will explain in more depth further below.⁷

BCM is especially interesting for four reasons. First, the BCM presents DFS opportunities that are twofold, e.g., in terms of offering employment to women as business correspondents as well as by providing better access to financial services to female consumers. Second, the scale of the network of business correspondents is larger compared to that of other microfinance or financial inclusion models apart from that of the government direct benefit transfer model. Third, while the government direct benefit transfers are of a huge scale, totalling a value of INR 6.3 trillion through 71.7 billion transactions during the financial year 2021/22,⁸ they are restricted to recipients of government programmes and schemes so their application may be limited from a DFS innovation and gender inclusivity point of view. The BCM on the other hand, offers options for a range of partners to be involved to further expand the reach of business correspondents, such as banks, non-banking financial institutions, financial inclusion start-ups, social enterprises, and so forth. Their potential for scale of reach and depth of innovative service provision going forward is therefore significant. Fourth, the BCM is focussed on rural India, which faces a bigger challenge of financial inclusion and digitisation than urban India due to poor digital infrastructure as well as further social and cultural barriers alluded to in the sections above. While the BCM is not a completely digital model, it leverages digital technology to operate in its modern avatar and is an example of how digital technology and non-digital implementation often goes hand-in-hand when providing digital services.

The remainder of this section presents the BCM in more detail by first introducing the BCM in its varied forms and explaining the role that women correspondents play. This is followed by discussing the evidence in relation to female business correspondents and their activities during COVID-19. Finally, we outline some of the challenges that women face while engaging as business correspondents.

⁷ We should note, however, that it would be beyond the scope of this paper to provide an in-depth discussion of the impact of SHGs and evaluate their role in facilitating financial inclusion, instead see Brody et al (2015) for details.

⁸ Originally stated as INR 63,02,64,71,06,037 across 7,17,14,88,858 transactions, as per Government of India's Direct Benefit Transfer website <https://dbtbharat.gov.in/reportnew/scheme-group-report> as of 28 July, 2022.



The Business Correspondent Model

In order to deepen banking access in rural India, the Reserve Bank of India introduced the concept of bank agents, originally called Business Correspondents or Bank Correspondents in 2006 (CDFI 2019). Initially, the model allowed public and private banks to partner with qualified agents (who would apply directly to the banks or via intermediaries) in order to provide banking services in areas where no bank branches were available. However, over time partnering with business correspondents was expanded to Non-Banking Financial Companies (NBFCs) and payment banks (CDFI 2019). By March 2020, 94.6% of villages with a population of more than 5000 individuals had access to banking services, and by September 2019, 99.2% of villages with less than 2000 individuals had access to banking services (Pinto and Arora 2021). This is primarily due to the expansion of the business correspondent network across the country.

However, the vast majority of business correspondents are male. In 2022, women made up only 2% of business correspondents in public sector banks; and 11.2% in private banks (Financial Express 2022 citing SBI report), and overall, about 10% of all business correspondents were women (The Hindu Business Line 2021). However, the rates vary between states, with Tamil Nadu and Kerala reporting that 20% of their business correspondents are female, while the figure is 9.5% in Uttar Pradesh, Haryana and Rajasthan (Financial Express 2022). In 2012, NABARD, who had originally introduced the concept of linking SHGs to banks and training these all-female groups in managing their finances, piloted extending their SHG-Bank linkage programme to the BCM. The NABARD project employed and trained existing SHG members who had already had basic training in how to manage finances via the SHG model, as business correspondents in Uttar Pradesh and Madhya Pradesh (CDFI 2019). Since 2016, there has been a concerted effort to increase the number of female business correspondents from state and central government, by extending and tweaking NABARD's original model by working with India's vast network of women's SHGs. Adapting the original business correspondent model, the central government's Deendayal Antayodaya Yojana-National Rural Livelihoods Mission rolled out a SHG-linked business correspondent programme across several states in the country. This programme builds capacity of SHG members, often called *Bank Sakhis*,⁹ to carry out basic banking services via tablets and phones. In addition, the programme provides grants to buy phones and tablets, offering initial working capital, creating linkages to banks and other financial services providers that women SHGs usually partner with; and providing a basic honorarium for the first 6 to 12 months (The Hindu Business Line 2021; Kumar et al., 2020 in Pinto and Arora 2021, p. 8). Over time, *Bank Sakhis* were expected to earn an income on their transactions, i.e., they would gain a commission of 0.5% on each transaction (Hindustan Times 2022). By February 2020, 6094 *Bank Sakhis* had carried out a total

⁹ The terms *Bank Sakhis* and *Bank Mitras* are used interchangeably and refer to a female banking correspondent in this section we will interchangeably use *Bank Sakhis* and female business correspondents.



of 748,454 transactions worth INR 2.66 billion or USD 37 million¹⁰ (The Hindu Business Line 2021). Women business correspondents essentially work as an extension of banks, providing services such as bank account applications and account openings, cash withdrawals and deposits, bank transfers, etc. They also offer options for accessing government direct benefit transfers such as pensions, scholarships for school children, and payments under employment schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act and the COVID relief scheme (Hindustan Times 2022). Business correspondents work in a hybrid online-offline modus. To support their hybrid existence, business correspondents use tablets and phones to access customer accounts and services. They use the Aadhaar-enabled payment system AePS to make transactions and biometric identification to verify customers and approve service requests (Pinto and Arora 2021).

In terms of delivery of the SHG-linked business correspondent model, for states participating in this programme, it is commonly the State Rural Livelihoods Mission (SRLM) that is involved in the roll-out. For example, in Bihar, the Bihar Rural Livelihoods Promotion Society (JEEViKA) is championing the *Bank Sakhi* programme, while in Jharkhand it is the Jharkhand State Livelihood Promotion Society (JSLPS) that does so (Pinto and Arora 2021; Hindustan Times 2022). While the NRLM and SRLM certify and accredit SHG members as business correspondents or *Bank Sakhis*, there are a number of other intermediaries engaged in the *Bank Sakhi* model: Financial service providers including traditional public and private sector banks such as SBI and Bank of Baroda and new age digital-first banks and platforms such as *PayTM* but also NGOs such as Grameen Foundation and social enterprises such as Frontier Markets which act as intermediaries between SHGs and the finance providers (Nextbillion 2022; MSC 2019).

Increase of Bank Sakhi Activity During COVID-19

The SHG-linked business correspondent model saw a significant increase in activity during COVID-19. This is in part due to the lengthy government-mandated lockdowns which placed restrictions on movement of people, which made it difficult for individuals to access banks and make withdrawals, payments and deposits. The work of business correspondents was classified as 'essential services' and thus they were able to continue providing doorstep financial services (CFI 2020; World Bank 2020). Furthermore, the central government provided relief packages (e.g., the Pradhan Mantri Garib Kalyan Yojana) including monthly grants as a social safety net for low-income individuals in the form of direct cash transfers. These and other direct cash transfers from the central and state government programmes were deposited directly into accounts held by women (CFI 2020). The funds could be withdrawn at banks or ATMs, or via business correspondents. As a result of these activities, the number of SHG-linked business correspondent transactions jumped significantly in the first half of 2020. For example, in April 2020, as the government released the

¹⁰ Using an exchange rate as of 28 July, 2022 of INR1 = USD 0.014 as per xe.com.



first tranche of relief payments, there was a 133% increase in AePS transactions over the previous month. At the same time there was a 46% increase in the number of *Bank Sakhis*, or women business correspondents during April to June 2020 (Pinto and Arora 2021, p. 10). In a study on Bihar and Odisha, the activities of female business correspondents rose by over 100% during the first lockdown imposed in India (Pinto and Arora 2021, p. 13).

Evidence from across India suggests that the *Bank Sakhi* model has enabled women to gain employment as well as better access to finance. For example, in Jharkhand, the Jharkhand State Livelihood Promotion Society estimates that *Bank Sakhis* undertook approximately 275,000 transactions worth about INR 1.2 billion (USD 16.8 million) a month, and credit linked to SHGs has increased from INR 270 million (USD 3.8 million) in 2013 to INR 32.34 billion (USD 452 million) in 2021 (Hindustan Times 2022). The study on Jharkhand notes that *Bank Sakhis* have a positive spill over effect on to other SHG members as one SHG member becoming a *Bank Sakhi* boosts confidence among other members (Hindustan Times 2022). One such *Bank Sakhi*, Surin, earns on average INR 10,000 a month based on about 800 transactions with a total value of INR 3.2 million (USD 44,700) (Hindustan Times 2022). In 2021, in Bihar, 1700 women worked as *Bank Sakhis* under JEE-ViKA. As evidence of gender inclusion, the *Bank Sakhis* were found to encourage more women customers to transact as well as to encourage lower transactions values than their male counterparts. By encouraging low transaction values, women, who generally have more limited means than men, are more likely to engage with financial inclusion (Pinto and Arora 2021, p. 13).

Likewise, in Maharashtra, *Bank Sakhis* working in partnership with Grameen Foundation, were found to not only earn more money, but also gain more financial independence, and greater agency with respect to financial decision-making within the family (Nextbillion 2022). By providing doorstep services, women business correspondents are able to meet demands of female customers who may have restricted movements due to socio-cultural norms, childcare, or physical barriers such as disabilities (Hindustan Times 2022). At the same time, female customers are more likely to be more comfortable engaging with a female business correspondent and sharing information about the family's financial needs (BSFI 2022).

Challenges of Female Business Correspondents

Despite successes of the business correspondent model, evidence of challenges with regard to this model persist. For example, a major technical challenge is the large number of failed digital financial transactions through the AePS payment system. Raghavan (2020) reports that the average failure rate was 39% in April 2020, which can significantly hinder effective services as well as make customers unsure of whether a transaction have gone through. The key reasons for these failed transactions were reported to be transaction timeouts as well as a mismatch in biometric identification (Pinto and Arora 2021, p. 17). Furthermore, poor internet connectivity restricts the ability of *Bank Sakhis* to undertake identification and transactions (Hindustan Times 2022). Furthermore, many *Bank Sakhis* reported that their lack



of technical and digital skills made it difficult for them to work effectively. Studies in Bihar and Odisha found that business correspondents would struggle with compliance issues as well as with access to adequate working capital (Pinto and Arora 2021). Compared to male business correspondents, female business correspondents were less likely to be viewed as professional financial service providers, especially by male customers. Female business correspondents were also less likely to earn the same amount of money as their male counterparts in a day, due to largely servicing female customers that would have fewer transactions at a lower volume (Nextbillion 2022). Finally, *Bank Sakhis* often face safety issues while travelling to and from villages with large amounts of cash (Hindustan Times 2022). This may explain the reluctance of some families to allow women to work as *Bank Sakhis*. A study on *Bank Sakhis*, in Maharashtra found that 90% of the women were in principle supported by their families in taking up the business correspondent role. However, the support was conditional upon women undertaking and prioritising care work in the home. Furthermore, 50% of women had to seek permission from the husband or other family members before leaving the home for work (Nextbillion 2022).

A last challenge relates to bank account ownership and access. As discussed in Sect. "Policy and Infrastructure Enablers of Digital Financial Inclusion in India", there are now many bank accounts belonging to women on paper which however remain dormant. MSC (2019) finds that this is often the case as women are frequently proxy users of their accounts. They may have opened an account on instruction of a male member of the family—such as a husband, brother, father or son—in order to obtain its benefits. However, the account is for all its good intentions and purposes operated by the male family member, and the woman's only role is in providing authentication. Women may not even know what they have been enrolled for a bank account as men would make all financial decisions (MSC 2019). Female business correspondents are likely to have a role to play in enabling such proxy users to gain agency to use the bank accounts themselves, e.g., to ease the many restrictions that limit women to be full users which includes gendered restrictions on mobility outside of the home, a lack of financial literacy and limited knowledge about digital technologies (MSC 2019).

In the next section, we will bring the various arguments outlined in the previous sections together and discuss the key messages of the case study in relation to the framework presented in Sect. "Analytical Framework and Study Methodology".

Discussion

While the number of female business correspondents in the BCM is still only around 10%, the model has demonstrated that with appropriate infrastructure and government policies in place, the gender gap of accessing digital finance can be improved. For example, putting in place digital enablers, referred to above as the JAM trinity (e.g., PMJDY, Aadhaar and Mobile technology penetration), allows female business correspondents to provide women with access to banking services. They do so by breaking down some of the barriers women commonly face when attempting to access and use digital financial services.



Table 3 Digital financial inclusion and gender: enabling and constraining factors

Factor level	Examples of factors
Policy and System	JAM Trinity enabling finance for all; UPI and AePS infrastructure
Community	Social and cultural norms related to women's use of technology & finance, as well as empowerment and agency
Organisational	Training and peer support through SHG & <i>Bank Sakhi</i> models
Interpersonal and Family	Family support use of mobile phone, use of digital finance, engagement with <i>Bank Sakhi</i> 's or working as <i>Bank Sakhis</i> , empowered to use own bank account
Individual	Confidence and knowledge in operating mobile phone and digital finance app; confidence in managing own finances, basic literacy and digital literacy, access to phone with adequate capability

Our framework in Sect. "[Analytical Framework and Study Methodology](#)" provided an overview of the five levels of factors that are likely to enable or to constrain women's access and use of DFS. Table 3 summarises how each of these factors relate to the previous discussion by providing examples. E.g., in Sect. "[Policy and Infrastructure Enablers of Digital Financial Inclusion in India](#)" we outlined the macro-level factors playing a role while in Sect. "[Case Study: The Business Correspondent Model and Women](#)" we presented our BCM case study to highlight the constraints that women face both as customers and as providers of DFS. Table 3 brings this all together; starting at the individual level, we find that female business correspondents are seen to be more approachable to women. Likewise, women are more likely to be comfortable engaging with female agents than male agents including discussing financial matters. *Bank Sakhis* are also more likely to accept small transaction volumes, which male business correspondents are reportedly dismissive of. *Bank Sakhis* provide doorstep banking services targeting women that cannot leave the house or are not allowed to interact with men to access banking services. Overall, *Bank Sakhis* have the potential to change attitudes towards DFS, building skills and confidence with regard to accessing and using digital devices and attempting to change attitudes in the household by facilitating the adoption of digital technologies.

At the interpersonal and family level, it is clear that factors such as conditional access to and use of mobile phones as well as agency over one's finances plays an important role in enabling women to engage in digital finance. The case study highlighted that families may use women's bank accounts on their behalf, while studies on India have shown that mobile phone access and use is often conditional on and controlled by other family members. Likewise, *Bank Sakhis* reported that they need permission and support from their family in order to work as business correspondents. Family can therefore be a significant enabling or constraining factor for women customers as well as women business correspondents.

At the organisational level, we note that *Bank Sakhis* work through SHGs and NGOs, forming communities of women who can provide peer support not just with regard to their digital training and financial expertise, but also with regard to their social and cultural needs. For *Bank Sakhis*, the organisational level is especially



important for providing employment opportunities, and for providing training on managing digital technology and digital finance including operating AePS transactions. In the case study discussion, we noted that some *Bank Sakhis* mentioned that their efficiency was hindered by a lack of digital capability. This suggests inadequate training as a constraining factor at the organisational level. The SHG-linked business correspondent model is able to build bridges between a range of institutions such as banks, NGOs and women's groups (SHGs) in order to provide financial services to women. On the customer side, it was reported that in some SHGs where female members also worked as business correspondents, their digital finance knowledge would spill over to other members in the group through peer-learning.

At the level of the community, factors such as cultural and social norms towards the use of digital technology and women's access to finance are important enabling or constraining factors. As mentioned above, women customers may have conditional access to a mobile phone, the primary digital device. Likewise, we argue that women's bank accounts may not be operated and controlled by them, instead used by other family members. *Bank Sakhis* may be constrained by cultural norms around women working outside of the home, travelling outside of the village or taking work calls in the evenings or in public, all of which can arise suspicion.

Lastly, at the macro policy and systems level, we note that the digital infrastructure put in place to enable digital financial inclusion, including the JAM Trinity, the payment banks, and the payment mechanisms such as UPI and AePS, are gender neutral (with the possible exception to promote the opening of bank accounts for women under PMJDY). However, it is important to emphasise that programmes such as the SHG-linked business correspondent model use this newly emerging digital infrastructure to promote gender inclusive digital financial inclusion to a certain degree of success.

Concluding Comments

Research suggests that financial inclusion is an enabler for 7 of the 17 SDGs (World Bank 2014).¹¹ In this context, gender inclusive finance is critical for the attainment of SDGs 1, 5 and 8 in particular. However, even as recently as 2017, close to 1.7 billion adults, half of who were women from poor households remain unbanked. The unsurmountable challenge of financially including women from low-income households requires novel approaches. India has pioneered some of the more promising approaches to digitisation and DFS. In this paper, we examined the gender inclusivity of India's digital financial revolution in relation to attaining the SDGs. Through a multi-level framework, we have connected the macro-level perspective of digital financial inclusion policy and infrastructure with the micro-level view of women's experiences of using finance through the BCM. We find that a number of factors especially at the level of the individual, the level of the family, the level of

¹¹ <https://www.worldbank.org/en/topic/financialinclusion/overview>.



the organisation and the level of the community have a significant role to play in either enabling or constraining women's access to DFS.

India is poised to continue its digital revolution given the widespread acceptance of its national biometrics' digital identity programme and the opening of millions of bank accounts for those who had remained unbanked due to the high costs associated with establishing customer identity. While demonetisation and COVID-19 provided some impetus to the government's digitisation efforts, the private sector also played an important role, especially in the rapid spread and take up of mobile phones. Our discussions have shown that a gender gap in mobile phone ownership and use remains, especially in relation to the type of mobile phone owned and in more advanced use. This has implications for women's ability to access and use DFS, and by extension their scope for digital financial inclusion. In other words, it appears that the control over mobile phones and thus the financial lives of women still rest with the husband and therefore these potential female customers are hard to reach as we have seen in the discussion of the BCM.

In addition, female customers often have smaller savings and tend to require small scale transactions making them less attractive as potential customers and hence further hampering their inclusion into digital finance. We have also seen that the use of digital finance is gendered, and thus social norms need to be considered in designing interventions to enable women to fully participate in financial institutions and markets. For example, financial and digital literacy, including online safety, must improve, again, in particular among women to prevent digital financial exclusion. The discussion of the BCM case study has shown that such initiatives can promote digitisation of financial services for women and thus build their digital and financial skill sets. We showed that having female business correspondents helped provide digital financial access for women that better suited their requirements. At the same time, female business correspondents were able to overcome some gendered socio-cultural issues including accessing women in their homes, being seen as more approachable to women, as well as offering to make smaller transactions, which suits women's needs better. However, overall, many technical, cultural and practical challenges remain. For example, the BCM case study discussion has indicated that rural areas have mobile network connectivity issues which accounts for the large number of failed transactions. At the same time, cash is still frequently used which poses safety issues during travel worrying many of the female business correspondents and further providing ammunition to their families to discourage them from engaging in work as business correspondents. For women to work outside the house is still frowned upon in rural areas and they often need permission to work and travel beyond their homes.

We have demonstrated that India has made big strides towards facilitating gender inclusive digital finance but more remains to be done. Research in this area is still in its nascent stages with very limited evidence on the kind of digital finance that is truly inclusive of low-income women, or the kind of policies that ought to be put in place to encourage more female participation. The evidence that is available heavily draws on grey literature sources such as newspaper articles and institutional reports which are up to date but often not sufficiently rigorous from an academic perspective. Hence, we recommend that policymakers and researchers focus their



efforts on collecting more data of sufficient rigour on how women use DFS to better understand supply and demand side issues of the gendered use of finance. Likewise, more studies are needed to assess the impact of current digital financial technologies and programmes. Finally, government officials and practitioners have a role to play to find ways to overcome the technical challenges that still persist hampering the growth of digital financial inclusion for low-income women, while cultural barriers need to be broken down to facility true gender equality.

Data Availability The data that support the findings of this study are openly available.

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