Digital Inequalities and Risks –
Perspectives from FinTech Sector in India

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A. Introduction

India has rapidly grown its FinTech sector with the Indian government focusing on expanding the use of FinTech services by developing technological stacks[1] and supplying other infrastructure[2] to establish an ecosystem for FinTech. In June 2022, digital payment contributed to 40 per cent of India's total payments in value.[3] The digital payment market was worth US$3 trillion due to factors including an increasing merchant acceptance network, disruptive innovations by FinTech, the rapid growth of digital infrastructure, the Unified Payments Interface (UPI) leading to digital migration, and the Covid-19 pandemic leading to the acceleration of customer migration to digital forms of payment.[4]

However, the rising digitalisation of daily life and financial decisions is not always accompanied by an increase in digital and financial literacy.[5] If education about the risks and effects of FinTech is not expanded at the same pace as the growth in FinTech, it could cause a lack of digital financial literacy.[6] The gap between digital financial literacy and the growth of FinTech can expose users to various risks while using FinTech services.

Furthermore, while looking at the risks in FinTech, the degree of risk an individual faces should also be considered. Many people have been exposed to FinTech indiscriminately, such as not having non-digital options in some places or it being less efficient compared to using FinTech services, but it is not often taken into consideration that not everyone has equal access to technology. There is a presence of 'digital inequality'[7] in FinTech usage which may create

[1] The phrase "technology stack" often refers to a collection of interconnected but separate single-purpose technologies known as "platforms" that collaborate to perform general-purpose activities; D'Silva D and others, 'The Design of Digital Financial Infrastructure: Lessons from India' [2019] BIS Papers Series

[2] Such as Bharat Bill Payment System (BBPS), National Electronic Toll Collection (NETC), Immediate Payment Service (IMPS), Unified Payments Interface (UPI), Real Time Gross Settlement (RTGS) and National Electronic Funds Transfer (NEFT); 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>

[3] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>

[4] Ibid.

[5] G20/OECD-INFE Policy Guidance on Digital Financial Literacy - OECD' <https://www.oecd.org/finance/financial-education/g20-oecd-infe-policy-guidance-digitalisation-financial-literacy-2018.htm> accessed 17 January 2023

[6] Ravikumar T and others, 'Digital Financial Literacy Among Adults in India: Measurement and Validation' (22 March 2022) <https://papers.ssrn.com/abstract=4063775> accessed 17 January 2023; 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf; 'G20/OECD-INFE Policy Guidance on Digital Financial Literacy - OECD' <https://www.oecd.org/finance/financial-education/g20-oecd-infe-policy-guidance-digitalisation-financial-literacy-2018.htm> accessed 17 January 2023

[7] 'Digital Inequality' refers to the unequal distribution of access to and use of digital technologies among different social groups, such as income, age, gender, race, and geographic location; DiMaggio P and Hargittai E, 'From the "Digital Divide" to "Digital Inequality": Studying Internet Use as Penetration Increases' (2001)

barriers for certain populations to access and benefit from financial services, leading to exclusion from the formal financial system and higher exposure to the risks of FinTech.

This paper discusses

i. The rapid growth of Fintech in India.
ii. The reasons for such growth.
iii. The lack of financial literacy amongst Indian citizens.

The paper then argues that

iv. There is a major gap between education about the risks in FinTech and the growth of the FinTech sector in India which exposes users to risks.
v. This gap is substantial due to the inadequate attention of the Indian government towards digital financial literacy.
vi. Due to the presence of 'digital inequalities' in the FinTech sector in India, there is a lack of Financial Inclusion.

B. Growth of FinTech in India

The EU Parliament defines FinTech as "finance enabled by new technologies".[8] The National Economy Council of the White House on similar lines provide a more elaborative definition and defines FinTech as "a wide spectrum of technological innovations which impact a broad range of financial activities, including payments, investment management, capital raising, deposits and lending, insurance, regulatory compliance, and other activities in the financial services space".[9] The National Economy Council provides examples of such technological innovations as online marketplace lending, payment systems for merchants and customers, tools for investment and savings, digital currency etc.[10] Therefore, FinTech can be broadly defined as 'the use of technology to provide financial services'.

India is a country with a population of 1.3 billion people, and the number of mobile users is estimated to be around 1.2 billion. The mobile penetration rate in India is 89%, which is one of the highest in the world.[11] The Indian government's 'Digital India'[12] programme is expected to turn the whole country into a digitally enabled society as well as a knowledge economy. Mobile money[13] is quickly becoming a vital instrument for financial inclusion, bringing together rural India's unbanked people.[14] The Internet was initially offered in India in 1995, and the first wave of e-commerce[15] followed shortly after. Mobile payments[16] using AI

[8] Organisation for Economic Co-operation and Development, 'Financial Markets, Insurance and Private Pensions: Digitalisation and Finance' (2018) <www.oecd.org/finance/financial-markets-insurance-and-pensions-report.htm> accessed 24 May 2022

[9] National Economy Council, 'A Framework for FinTech' (whitehouse.gov, 13 January 2017) <https://obamawhitehouse.archives.gov/blog/2017/01/13/framework-fintech> accessed 20 May 2022

[10] Ibid.

[11] PTI, 'India to Have 1 Billion Smartphone Users by 2026: Deloitte' The Hindu (22 February 2022) <https://www.thehindu.com/business/india-to-have-1-billion-smartphone-users-by-2026-deloitte/article65075151.ece> accessed 29 November 2022

[12] 'Digital India | Digital India Programme | Ministry of Electronics & Information Technology (MeitY) Government of India' <https://www.digitalindia.gov.in/> accessed 30 November 2022

[13] International Monetary Fund defines 'Mobile Money' as a form of mobile payment service typically offered by a Mobile Network Operator (MNO) or another entity in partnership with an MNO using mobile money accounts; Shirono K and others, 'Is Mobile Money Part of Money? Understanding the Trends and Measurement' (2021) <https://www.imf.org/en/Publications/WP/Issues/2021/07/01/Is-Mobile-Money-Part-of-Money-Understanding-the-Trends-and-Measurement-461315> accessed 15 March 2023

[14] Jakhiya M, Mittal Bishnoi M and Purohit H, 'Emergence and Growth of Mobile Money in Modern India: A Study on the Effect of Mobile Money', 2020 Advances in Science and Engineering Technology International Conferences (ASET) (2020)

[15] E-commerce refers to the buying and selling of goods and services over the internet or other electronic networks. It involves the use of technology such as electronic funds transfer, online transactions, and electronic data interchange to conduct business transactions; Oxford University Press, Oxford Dictionary of Law, "E-commerce" (Oxford University Press, 8th ed, 2015).

[16] Mobile payments means the use of mobile phones to utilise payment services; Karsen M, Chandra YU and Juwitasary H, 'Technological Factors of Mobile Payment: A Systematic Literature Review' (2019) 157 Procedia Computer Science 489

solutions is one example of technology that is widely utilised today and has already begun to propel the FinTech sector forward for the Fourth Industrial Revolution.[17] The rapid proliferation of mobile phones, portable computers, and other mobile devices seems to be the driving force in next-generation e-commerce. This has led to growth in the FinTech market in India.

India's FinTech ecosystem has experienced rapid expansion in recent years in line with global trends, making it one of the largest and fastest-growing FinTech markets.[18] India was in the limelight with its FinTech accomplishments echoing the industry's international momentum in 2021.[19] After the US and the UK, India is the third-largest market for FinTech, with several businesses, financing, and unicorns.[20] According to a recent report[21] by Ernst & Young and Chiratae Ventures, the India FinTech sector would increase by 10 times over the next ten years, reaching $1 trillion in Asset Under Management and $200 billion in revenues.

[17] Karsen M, Chandra YU and Juwitasary H, 'Technological Factors of Mobile Payment: A Systematic Literature Review' (2019) 157 Procedia Computer Science 489
[18] Nilesh Naker, 'The Winds of Change: Trends Shaping India's FinTech Sector: Edition II' (Ernst & Young 2022) <https://www.ey.com/en_in/consulting/chapter-2-the-winds-of-change-trends-shaping-india-s-fintech-sector> accessed 23 November 2022
[19] Ibid.
[20] Ibid.
[21] Sundaram Tcm and others, '$1 Tn India FinTech Opportunity' (Ernst & Young and Chiratae Ventures 2022)

C. Reasons for the growth of FinTech in India

There are several identifiable contributing factors to the so-called 'explosion' of FinTech in India in recent years. Changes in societal habits, together with technological advancements mean that consumer behaviour has dramatically shifted. Ten of the most notable factors explaining this change include:

1. Pradhan Mantri Jan-Dhan Yojana –

The "Pradhan Mantri Jan-Dhan Yojana (PMJDY)"[22] scheme, as a scheme for promoting financial inclusion in India, has increased the number of bank accounts. The PMJDY scheme has led to the opening of 473 million bank accounts so far since it was introduced.[23] The scheme aims to ensure one basic banking account per household, increase financial literacy, and increased access to insurance, credit, and pension facilities. The scheme also provides a RuPay Debit card to the beneficiaries with an inbuilt insurance cover of ₹ 100,000. Another key aspect of this scheme is that it empowers the Union Government's Direct Benefits Transfer (DBT) scheme, where the Indian government aims to direct all government benefits (from the Centre, States, and Local Bodies) directly into recipients' accounts

2. Building digital infrastructure rapidly –

Digital infrastructure such as the Bharat Bill Payment System (BBPS) launched by the National Payments Corporation of India (NPCI) provides a centralised bill payment system.[24] It allows interoperable and accessible bill payment mechanisms by providing various digital modes of bill payments such as using UPI, debit cards, credit cards, digital wallets, internet banking etc. and instant payment confirmation.[25]

Similarly, another service developed by the NPCI is the National Electronic Toll Collection (NETC) program[26], which provides a nationwide interoperable road toll payment[27] mechanism

[22] 'Pradhan Mantri Jan-Dhan Yojana | Department of Financial Services | Ministry of Finance' <https://pmjdy.gov.in/about> accessed 13 November 2022
[23] Ibid.
[24] 'About Bharat Bill Pay (BBPS)' <https://www.bharatbillpay.com/about-us#about-bbpc> accessed 16 November 2022
[25] Ibid.
[26] 'NETC FASTag: Pay Highway Toll Online Through RFID | NPCI' <https://www.npci.org.in/what-we-do/netc-fastag/product-overview> accessed 16 November 2022
[27] The central government in India levies fees for the use of national highways under the Section 9 of the National Highways Act, 1956.

using the FASTag[28]. The FASTag technology not only encourages customers to adopt digital payments but also helps in reducing the clutter of vehicles at toll collection stations.[29] Since the debut of FASTag in 2017, which was supported by a requirement from the Ministry of Road Transport & Highways (MoRTH) requiring all cars to use FASTag, around 49 million tags have been issued, with over 2.4 billion transactions processed in the Financial Year (FY) 2022.[30] This is already playing an important role in digitising payments in the transportation sector and contributing to the country's broad-based expansion of digital payments.[31]

The introduction of the Digital Rupee[32] referred to as '₹', a CBDC (Central Bank Digital Currency) in India, may address several issues, including security concerns about digital payments, transparency, and transaction traceability. The Reserve Bank of India (RBI) launched a pilot project on 1 November 2022 introducing the digital rupee in the wholesale segment; restricted access will be given to certain institutions with a proposed launch to retail CBCD in the future.[33] CBDC is defined generally by the Reserve Bank as digital legal money issued by a central bank. It is similar to sovereign paper money but in a new form, is exchangeable at par with current currency, and is to be accepted as a medium of payment, legal tender, and a secure store of value.

3. Fast digitalisation fuelled by UPI –

Unified Payments Interface (UPI) is a system that was introduced by the National Payment Corporation of India where a single mobile application can allow various bank accounts under one umbrella app and enables several banking features such as smooth fund transfers and merchant payments.[34] India's UPI has recorded 6.8 billion transactions totalling more than $135

[28] For making toll payments immediately while the car is moving, a gadget called FASTag uses Radio Frequency Identification (RFID) technology. The FASTag (RFID Tag) is attached to the vehicle's windscreen and allows users to pay tolls using the associated prepaid account.
[29] C. Bari, A. Kumawat, and A. Dhamaniya, 'Effectiveness of FASTag System for Toll Payment in India', 2021 7th International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS) (2021)
[30] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[31] Ibid.
[32] 'Concept Note on Central Bank Digital Currency' (Reserve Bank of India 2022) <https://rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=1218> accessed 27 March 2023
[33] Ojha S, 'Explained: What Is Digital Rupee? RBI Launches First Pilot Project Today' (mint, 1 November 2022) <https://www.livemint.com/news/india/explained-what-is-digital-rupee-rbi-launches-first-pilot-project-today-11667265156844.html> accessed 25 November 2022
[34] 'UPI: Unified Payments Interface - Instant Mobile Payments | NPCI' <https://www.npci.org.in/what-we-do/upi/product-overview> accessed 17 November 2022

billion as of September 2022.[35] UPI has been the game-changing option for digital payments in India. Particularly in Peer-to-Peer (P2P) financial transfers and low-value merchant Person to Merchant (P2M) payments, the UPI system has rapidly accelerated India's shift to non-cash payments. The same can be seen in the data provided by the National Payment Corporation of India.[36] Rastogi et al[37] conducted an empirical study by administering structured questionnaires to about five hundred participants in rural or semi-rural areas of the Maharashtra state of India. The criteria for qualifying as a participant was that they had to be a PMJDY (Pradhan Mantri Jan Dhan Yojana) account holder so that they could gain access to the fundamental components of digital transactions and other mainstream financial or banking services. They found that UPI promoted the digital environment and aided in the inclusion of those who are at the bottom of the social pyramid in the financial system and further concluded that even those with PMJDY accounts may use UPI for safe transactions.[38] This shows an overlap between two different factors that led to the growth of FinTech in India. Two separate initiatives i.e., UPI and PMJDY, work together to increase the penetration of FinTech in the Indian market.

4. Customer preferences are changing because of the pandemic and leading them to shift to digital –

Covid-19 brought an irrevocable change in consumer behaviour including the acceleration of digital payment in India.[39] Following the implementation of the lockdown in March 2020, more than a 50% increase in monthly transaction volumes was seen across UPI, BBPS, and Immediate Payment Service (IMPS)[40] over six months.[41]

[35] 'Financial Services Sector in India | FinTech Industry in India' <https://www.investindia.gov.in/sector/bfsi-fintech-financial-services> accessed 13 November 2022
[36] 'Unified Payments Interface (UPI) Product Statistics | NPCI' <https://www.npci.org.in/what-we-do/upi/product-statistics> accessed 17 November 2022
[37] Rastogi S and others, 'Unified Payment Interface (UPI): A Digital Innovation and Its Impact on Financial Inclusion and Economic Development' (2021)
[38] Ibid.
[39] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[40] IMPS is a banking service that offers instant fund transfer electronically. This service can be accessed on several means like Internet, ATM, mobile and SMS; 'IMPS (Immediate Payment Service) – Instant Fund Transfer | NPCI' <https://www.npci.org.in/what-we-do/imps/product-overview> accessed 20 November 2022
[41] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>

5. Increased adoption of digital payments by merchants –

The introduction of QR Codes for making payments has revolutionised the payments market in India.[42] Utility bills, petrol, groceries, food, travel, and many other categories may all be paid for by just scanning a QR code.[43] QR codes provide quicker digital payments compared to typical Point of Sale (POS) machines.[44] Seventy-five per cent of business-to-consumer (B2C) merchants already accept QR codes. Due to this, merchant payments increased from 12% of UPI volumes in 2018 to more than 45% in 2021.[45] Also, there is wider acceptance of QR codes compared to POS machines by small-scale merchants in India as a POS machine for small merchants is a substantial investment. It costs about ₹12000 for a typical POS machine and ₹5000 for an mPOS machine; however, in the case of a QR code, they just have to take a printout.[46] India's retail market largely consists of unorganised retailers which include street vendors and small businesses run by individuals or families and many other small-scale merchants.[47] However, in developed countries like the UK consumers mostly rely on large retailers such as Tesco, Sainsbury, Aldi etc.[48] Therefore, the merchants in India prefer cheaper solutions. Further proof of this is the fact that more than 30 million businesses now accept QR payments, a 12x increase over the 2.5 million businesses that did so five years ago. In contrast, the rise in the overall number of POS machines, which was over 6 million in FY22 (including cases where a single merchant had multiple POS machines), has been rather static.[49]

New products that support QR code payments include the Unified Payments Interface[50], which again shows the overlap between different technological advancements. The National Payments Corporation of India launched 'Bharat QR', which is a common standard for

[42] Ibid.; 'Bharat QR Code – Pay Merchants with QR Code | NPCI' <https://www.npci.org.in/what-we-do/bharatqr/product-overview> accessed 23 November 2022
[43] 'QR Codes – The New Age Tech Shaping India's Digital Payments Landscape' <https://www.npci.org.in/blogs/qr-codes-the-new-age-tech-shaping-india-s-digital-payments-landscape> accessed 21 November 2022
[44] Ibid.; 'Bharat QR Code – Pay Merchants with QR Code | NPCI' <https://www.npci.org.in/what-we-do/bharatqr/product-overview> accessed 23 November 2022
[45] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[46] 'QR Codes – The New Age Tech Shaping India's Digital Payments Landscape' <https://www.npci.org.in/blogs/qr-codes-the-new-age-tech-shaping-india-s-digital-payments-landscape> accessed 21 November 2022
[47] 'India's Fast-Growing Retail Sector: A Behemoth at Risk Due to Covid?' (10 September 2020) <https://www.retailgazette.co.uk/blog/2020/09/india-indian-retail-analysis-covid-market-snapshot/> accessed 21 November 2022
[48] Ibid.
[49] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[50] Ibid.

payment QR codes.[51] A unique feature of Bharat QR is that it provides interoperability between cardholders of all banks and UPI users, making payments even easier.[52] In other words, one can pay a merchant with any bank account by just scanning the Bharat QR code. This initiative helped transactions such as UPI become more widely accepted and the merchants who used to not operate in UPI were also able to accept payment from UPI users. The overlap between different digital infrastructures allowed interoperability and created an ecosystem for the digitisation of finance in India.

6. A radical change in finance by FinTech and big tech due to technological innovations–

With an acceptance rate of 87 per cent, India and China are at the top of the 2019 Global FinTech Adoption Index.[53] A crucial enabler, the Unified Payments Interface (UPI), virtualises accounts and makes it easier for users to make financial transfers and merchant payments.[54]

The range of markets and applications is what distinguishes India's FinTech sector from other sectors. FinTech does not follow the trend of emerging businesses that often concentrate in a particular area to take advantage of agglomeration effects.[55] FinTech is also spreading to smaller cities while majorly focused in large metropolitan areas like New Delhi, Mumbai, Bangalore, and Hyderabad.[56]

7. Network effect –

The rise of digital payment services has been greatly aided by the network effect, as seen with the example of UPI.[57] From FY19 to FY22, the number of registered UPI users skyrocketed from 20-25 million to 250-300 million, leading to over 100% year-over-year (YoY) growth in transaction volumes.[58] This momentum is expected to only strengthen in the future, as more users become part of the platform. To make this possible, companies need to focus on creating

[51] 'Bharat QR Code – Pay Merchants with QR Code | NPCI' <https://www.npci.org.in/what-we-do/bharatqr/product-overview> accessed 23 November 2022
[52] 'Bharat QR Code – Pay Merchants with QR Code | NPCI' <https://www.npci.org.in/what-we-do/bharatqr/product-overview> accessed 23 November 2022
[53] 'FinTech: The Force of Creative Disruption' (The Reserve Bank of India 2020) <https://www.rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=19899> accessed 23 November 2022
[54] Ibid.
[55] Basole RC and Patel SS, 'Transformation Through Unbundling: Visualizing the Global FinTech Ecosystem' (2018) 10 Service Science 379
[56] 'FinTech: The Force of Creative Disruption' (The Reserve Bank of India 2020) <https://www.rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=19899> accessed 23 November 2022
[57] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[58] Ibid.

user-friendly customer journeys and hyper-personalized offerings that monetize data.[59] By doing so, they can ensure that digital payment platforms become even more successful and widely used.

8. Personalization of services –

Hyper-personalisation of user journeys and experiences involves leveraging technologies such as machine learning, artificial intelligence, and natural language processing to provide users with personalised experiences, customised offers, and tailored services that best meet their needs. This is done by analysing data such as user preferences, spending habits, and payment histories. With this data, payment players can offer users special offers, discounts, and loyalty rewards that are tailored to their individual needs and interests. This leads to increased user engagement, better customer service, and improved user retention.

Additionally, hyper-personalisation helps players stay ahead of the competition by providing users with innovative and unique services, making them stand out from the crowd. RBI has introduced the Central Know Your Customers (CKYC) scheme. The customer must provide documents such as valid identity proof (Aadhaar, PAN, Voter ID, etc.) and address proof (Aadhaar, electricity bill, etc.).[60] The documents are authenticated using biometric technology and then stored in the CKYC registry. The customer's KYC data includes personal details, photographs, biometric data, and other financial information.[61] Financial Institutions can access the customer's KYC data from the CKYC registry in real-time.[62] This enables the customer to access financial services from multiple banks and other financial institutions without having to provide the same documents multiple times.[63]

9. Moving beyond just digital payments: 'Super' apps[64] -

Super apps are becoming increasingly popular around the world and feature a wide range of services. They are a single application that provides access to a large customer base and collects

[59] Ibid.
[60] 'Reserve Bank of India - Notifications' <https://www.rbi.org.in/Scripts/NotificationUser.aspx?Id=10498&Mode=0> accessed 30 November 2022
[61] Ibid.
[62] Tiwari D and Shukla S, 'RBI, Banks in Talks to Strengthen KYC Identification Format' The Economic Times (25 August 2022) <https://economictimes.indiatimes.com/industry/banking/finance/banking/rbi-banks-in-talks-to-strengthen-kyc-identification-format/articleshow/93785384.cms> accessed 30 November 2022
[63] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[64] 'What Is a Superapp?' (Gartner) <https://www.gartner.co.uk/en/articles/what-is-a-superapp> accessed 29 November 2022

rich customer behaviour data.[65] This allows merchants to quickly and easily integrate with one platform to benefit from hyper-personalised services. This allows them to reach more customers and increase engagement; for instance, Alipay began as an e-wallet and has expanded to include ridesharing, travel, messaging, banking & insurance, food and groceries, and e-commerce services.[66] In Indonesia, Gojek began as a ridesharing platform and now offers e-wallet, travel, banking & insurance, food and grocery delivery, e-commerce, and loyalty.[67] In a similar vein, DNB's Vipps has rapidly overtaken all other mobile payment options in Norway. Today, most Norwegian customers just "Vipp" instead of "paying".[68] There are many super apps in India, including some FinTech apps such as Paytm and PhonePe, that offer various services on their platforms.

10. Access to credit –

As digital payments become more popular in India, financial institutions are taking advantage of the data generated from these transactions to better assess creditworthiness.[69] This could open access to credit to merchants that were previously excluded from lending services. The estimated unmet demand for lending to Micro, Small and Medium Enterprises (MSMEs) is US$250-260 billion.[70] In the past, payments and financing were handled mainly by banks. Now, more than 90% of UPI digital transactions are handled by third-party payment applications.[71] This trend is likely to continue, with the financing services being driven by FinTech using payment data.[72]

[65] Ibid.
[66] 'Visitors to China Can Now Use Alipay without a Chinese Bank Account' (South China Morning Post, 5 November 2019) <https://www.scmp.com/business/article/3036366/alipay-launches-international-e-wallet-giving-foreigners-access-electronic> accessed 30 November 2022
[67] 'Becoming Indonesia's First Unicorn: The Gojek Journey' <https://www.dbs.com/sustainability/sustainable-companies/from-a-small-social-enterprise-to-indonesias-first-unicorn-the-gojek-journey.page> accessed 30 November 2022
[68] 'DNB's Vipps: Norway's Leading Smart Payments App.' <https://www.bundl.com/articles/examples-dnbs-vipps-norways-leading-smart-payments-app> accessed 30 November 2022
[69] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>
[70] Ibid.
[71] Ibid.
[72] Ibid.

D. Lack of Financial Education and Financial Literacy among India citizens

The Organization for Economic Cooperation and Development (OECD) defines Financial Literacy and financial education. Financial Literacy is defined as 'A combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being.'[73] Financial Education, on the other hand, is defined as

> "the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being".[74]

The terms Financial Education and Financial Literacy are not synonymous, yet they are related ideas.[75] People obtain financial literacy through the process of financial education. The attainment of financial literacy allows users to make informed financial decisions, resulting in the individual's financial well-being.[76]

It's alarming that even though India's digital financial growth has been so fast with digital payment contributing to 40 per cent of India's total payments in value[77], as per the S&P Global FinLit Survey[78] over 75% of Indian adults lack an understanding of fundamental financial concepts.

India's National Centre for Financial Education conducted a nationwide survey[79] in 2019 to test the level of financial literacy and financial inclusion. The sample consisted of 75,000 adult participants aged 18 to 80, separated by location (rural or urban) and gender. The survey shows a severe lack of financial education and financial literacy with overall financial literacy in India

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[73] 'Toolkit for Measuring Financial Literacy and Financial Inclusion - OECD' <https://www.oecd.org/finance/financial-education/toolkit-for-measuring-financial-literacy-and-financial-inclusion.htm> accessed 16 January 2023

[74] 'OECD Legal Instruments' <https://legalinstruments-oecd-org.libezproxy.open.ac.uk/en/instruments/OECD-LEGAL-0338> accessed 16 January 2023

[75] 'National Strategy for Financial Education 2020-25' <https://ncfe.org.in/reports/nsfe/nsfe2025> accessed 16 January 2023

[76] Ibid.

[77] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) <https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf>

[78] 'S&P Global FinLit Survey' (Global Financial Literacy Excellence Center (GFLEC)) <https://gflec.org/initiatives/sp-global-finlit-survey/> accessed 22 January 2023

[79] 'Financial Literacy and Inclusion in India' (National Centre for Financial Education 2019) <https://www.ncfe.org.in/reports/nflis>

being only 27%. Only 24% of people in rural areas and 33% in urban areas were found to be financially literate.[80] Financial Literacy was also lowest amongst women, with a reported rate of 21% compared to 29% for men. The survey also suggested age as a factor in financial literacy. The report shows that four age brackets[81] were surveyed, and all the younger age brackets showed higher financial literacy compared to those older than them. Therefore, the youngest participants had the highest financial literacy and the oldest had the lowest financial literacy. The survey also showed that the proportion of financial literacy among respondents increases with education and income. The survey also found that government employees have the greatest proportion of financial literacy in the occupation category. The Centre adopted the OECD definitions for financial literacy and financial education.

The OECD guideline note[82] provides actionable steps in the development and implementation of financial education programmes on Digital Financial Services (DFS) to improve consumers' and entrepreneurs' digital financial literacy[83]. As per the note, some of the steps the policymakers should consider when implementing digital financial literacy programmes are:

- Creating a nationwide assessment of the effects of FinTech on people and business owners (along with any possible vulnerable groups) and gathering important data on the supply and demand sides of digital financial services.
- Mapping existing financial education provision and confirming that it covers financial education for digital financial services.
- Evaluating the financial education programmes addressing digital financial services and sharing the findings on a national and worldwide scale.
- Helping customers who are at risk of becoming overly reliant on easy access to online credit sources.

[80] Following OECD guidelines, they used a scoring system for the survey responses and a person was regarded financial literate if he/she had a combined score of at least 15 out of 22.
[81] 18-29 years, 30-49 years, 50-69 years, 70-79 years.
[82] 'G20/OECD-INFE Policy Guidance on Digital Financial Literacy - OECD' <https://www.oecd.org/finance/financial-education/g20-oecd-infe-policy-guidance-digitalisation-financial-literacy-2018.htm> accessed 17 January 2023
[83] OECD refers to Digital Financial Literacy as financial literacy with respect to Digital Financial Services and defines Digital financial services (DFS) as *"financial operations using digital technology, including electronic money, mobile financial services, online financial services, i-teller and branchless banking, whether through a bank or non-bank institutions. DFS can encompass various monetary transactions such as depositing, withdrawing, sending, and receiving money, as well as other financial products and services including payment, credit, saving, pensions, and insurance. DFS can also include non-transactional services, such as viewing personal financial information through digital devices*;" 'Ensuring Financial Education and Consumer Protection for All in the Digital Age' (OECD) <https://www.oecd.org/finance/g20-oecd-report-on-ensuring-financial-education-and-consumer-protection-for-all-in-the-digital-age.htm> accessed 25 January 2023

Looking at where the Indian policymakers and regulators stand on OECD guidelines to implement an effective programme for digital financial literacy can provide a good indicator of the promotion of digital financial literacy in India.

- A nationwide assessment of the effects of FinTech on people and business owners:

No such national-level assessment has been carried out in India,[84] especially when it comes to assessing the level of negative effects of digitisation of financial services or checking the level of awareness of people towards the risks of FinTech. The report[85] on 'Financial Literacy and Inclusion in India' does not specifically focus on digital financial literacy but checks overall financial literacy. The questionnaire had no questions related to FinTech. Therefore, the task of creating an effective policy fails on the first step of having a dedicated nationwide diagnosis to show the effects and risks of FinTech.

- Mapping existing financial education provision and confirming that it covers financial education for digital financial services:

The report[86] by the National Centre for Financial Education maps all the existing initiatives by all the regulators in India to improve financial education but not specifically financial education for digital financial services. Other than the Reserve Bank of India (central financial regulatory body), none of the regulators provides education specifically targeting FinTech and its risks. The Reserve Bank of India sends text messages and releases small audio-visual messages through mass media to spread awareness towards cyber security risks under the "RBI Kehta Hai..." campaign.[87] However, that is the only direct awareness campaign dedicated towards the risks of FinTech. This awareness initiative by the RBI towards risks of FinTech is also not specific for people with diverse needs but is a one-size-fits-all campaign. There is a lack of initiatives by the Indian government to create awareness towards the risks of FinTech.

[84] Ravikumar T and others, 'Digital Financial Literacy Among Adults in India: Measurement and Validation' (22 March 2022) <https://papers.ssrn.com/abstract=4063775> accessed 17 January 2023
[85] 'Financial Literacy and Inclusion in India' (National Centre for Financial Education 2019) <https://www.ncfe.org.in/reports/nflis>
[86] Ibid.
[87] 'Reserve Bank of India' <https://www.rbi.org.in/commonperson/English/Scripts/rbikehtahai.aspx> accessed 10 January 2023

- Evaluate the financial education programmes addressing digital financial services and share the findings on a national and worldwide scale:

There has not been any evaluation of financial education programmes addressing FinTech services or the risks associated with it them in India.

- Help customers who are at risk of becoming overly reliant on easy access to online credit sources:

In January 2021, the Reserve Bank of India released Guidelines on Digital Lending[88] but they did not include any plan to spread awareness to customers about being overly reliant on online credit.

The above-mentioned facts point towards the lack of promotion of digital financial literacy by the Indian government.

[88] 'Reserve Bank of India - Notifications' <https://www.rbi.org.in/scripts/NotificationUser.aspx?Id=12382&Mode=0> accessed 20 January 2023

E. The gap between Financial Literacy and the growth of FinTech exposes users to risks

Being aware of financial scams or potential fraud and taking precautions to avoid being a victim of these is a sign of a financially literate and resilient individual.[89] Higher levels of financial literacy and financial education reduced financial risk along with higher use of mobile and online payments.[90] Research[91] conducted with a sample of 2209 adult Norwegians found that those who had financial education were more likely to use FinTech for transactions compared to those without. The study showed that those with financial education were more actively engaged in financial transactions through new platforms, suggesting that they had a higher level of acceptance of new FinTech services and were less exposed to the risks associated with FinTech. Similarly, other studies[92] have found that higher financial literacy reduces the risks of FinTech. Therefore, lacking financial literacy is a strong indicator of the fact that an individual would be more exposed to the risks of FinTech.

The OECD suggests that policymakers while designing policies for effective financial education should ensure that they cover financial education on FinTech services and increase the digital financial literacy of consumers and entrepreneurs.[93] Improving financial literacy leads to increased adoption and utilisation of FinTech services, particularly among underrepresented consumer groups such as women.[94]

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[89] 'International Gateway for Financial Education - Organisation for Economic Co-Operation and Development' <https://www.oecd.org/financial/education/launchoftheoecdinfeglobalfinancialliteracysurveyreport.htm> accessed 16 January 2023

[90] Anderloni L, Bacchiocchi E and Vandone D, 'Household Financial Vulnerability: An Empirical Analysis' (2012) 66 Research in Economics 284; Seldal MMN and Nyhus EK, 'Financial Vulnerability, Financial Literacy, and the Use of Digital Payment Technologies' (2022) 45 Journal of Consumer Policy 281

[91] Heo W, Lee JM and Rabbani AG, 'Mediation Effect of Financial Education between Financial Stress and Use of Financial Technology' (2021) 42 Journal of Family and Economic Issues 413

[92] Lusardi MM and others, 'Determining Risk of Falls in Community Dwelling Older Adults: A Systematic Review and Meta-Analysis Using Posttest Probability' (2017) 40 Journal of Geriatric Physical Therapy (2001) 1; Scheresberg C de B, Hasler A and Lusardi A, Millennial Mobile Payment Users: A Look into Their Personal Finances and Financial Behavior (Asian Development Bank 2020) <https://www.adb.org/publications/millennial-mobile-payment-users-personal-finances-financial-behavior> accessed 30 January 2023; Yakoboski P, Lusardi A and Hasler A, The 2018 TIAA Institute-GFLEC Personal Finance Index The State of Financial Literacy Among U.S. Adults (2018)

[93] 'G20/OECD-INFE Policy Guidance on Digital Financial Literacy - OECD' <https://www.oecd.org/finance/financial-education/g20-oecd-infe-policy-guidance-digitalisation-financial-literacy-2018.htm> accessed 17 January 2023

[94] 'The Impact of COVID-19 on Digital Financial Inclusion' (G20 Italia 2021) <https://www.gpfi.org/sites/gpfi/files/sites/default/files/5_WB%20Report_The%20impact%20of%20COVID-19%20on%20digital%20financial%20inclusion.pdf>

In India, there is no standalone data that has evaluated the level of awareness of users towards the risks of FinTech.[95] In the absence of such data, reliance must be placed on the only nationwide survey[96] in India, carried out in 2018 to check financial literacy among Indian citizens. As observed earlier, globally, India is the third-largest market globally for FinTech. However, only 27% of adults in India are financially literate. Such a low level of financial literacy is a strong indicator of the high exposure to the risks of FinTech amongst Indian users.

[95] Ravikumar T and others, 'Digital Financial Literacy Among Adults in India: Measurement and Validation' (22 March 2022) <https://papers.ssrn.com/abstract=4063775> accessed 17 January 2023
[96] 'Financial Literacy and Inclusion in India' (National Centre for Financial Education 2019) <https://www.ncfe.org.in/reports/nflis>

F. Inadequate attention of the government towards Digital Financial Literacy

The National Centre for Financial Education (NCFE)[97] has developed the National Strategy for Financial Education (NSFE 2020-2025)[98], which was created with input from financial sector regulators, various government ministries, and other stakeholders to enhance financial education and literacy in India. One of the strategic objectives of NSFE 2020-2025[99] is to 'Improve usage of digital financial services safely and securely'. However, it is only one of the nine objectives mentioned in the National Strategy of Financial Education. The strategy's primary focus is to increase savings, improve access to credit and insurance services etc. Therefore, the main drawback of the financial education strategy adopted by NCFE is that it does not directly address education towards risks of FinTech. Some of the questions that the plan seeks to address as part of the financial education strategy are: "How to use an ATM card?"; "How to fill out a loan application form?[100] Digital financial initiatives are stuck at a primitive stage. However, the government of India is already launching digital currency along with various other sophisticated digital financial initiatives such as electronic toll collection, centralised bill payment system etc. FinTech firms are delving into further complicated digital financial services. It seems that digital financial education has taken the back seat in the Indian government's agenda. A plan to observe a Digital Financial Services Day has been proposed under the NSFE[101] but doesn't showcase exactly what problems they will address through this initiative. The financial education strategy under the NSFE 2020-25 is primitive and does not directly deal with the risks associated with FinTech.

Aside from the Reserve Bank of India, no other financial regulator in India provides education specifically aimed at FinTech and its associated risks. The Reserve Bank's efforts to raise awareness of these risks through its "RBI Kehta Hai..." campaign[102], which involves sending text messages and short audio-visual messages through mass media, are insufficient. This one-size-fits-all approach does not cater to the diverse needs of individuals. Furthermore, as per the

[97] The National Centre for Financial Education (NCFE) is a company established by the Insurance Regulatory and Development Authority of India (IRDAI), Securities and Exchange Board of India (SEBI), Reserve Bank of India (RBI), and Pension Fund Regulatory and Development Authority (PFRDA) with support from the Financial Stability and Development Council (FSDC), Ministry of Finance, Government of India. The objective of NCFE is to spread financial education throughout India; "NCFE, 'About Us' (National Centre for Financial Education, https://www.ncfe.org.in/aboutus), accessed on 15 January 2023."
[98] 'NSFE 2020-25' <https://www.ncfe.org.in/reports/nsfe/nsfe2025> accessed 20 January 2023
[99] Ibid.
[100] Ibid.
[101] Ibid.
[102] 'Reserve Bank of India' <https://www.rbi.org.in/commonperson/English/Scripts/rbikehtahai.aspx> accessed 10 January 2023

National Centre for Financial Education survey[103], 16 per cent of the respondents said that they have not heard or seen RBI awareness messages about financial security. The Indian government lacks initiatives to create awareness about the risks of FinTech.

The main stakeholders to embark on financial literacy in India are the National Centre for Financial Education (NCFE), the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), the Insurance Regulatory and Development Authority of India (IRDAI), the Pension Fund Regulatory and Development Authority (PFRDA), the National Bank for Agriculture and Rural Development (NABARD), the Small Industries Development Bank of India (SIDBI) and the National Payments Corporation of India (NPCI).[104] The report[105] by the National Centre for Financial Education maps all the existing initiatives by these regulators to improve financial education. However, none of the schemes specifically or adequately deal with digital financial literacy or education towards the effects and risks of FinTech. When it comes to FinTech services, regulators focus mostly on promoting the growth of FinTech while ignoring the need for awareness about the risks of FinTech.[106]

The government of India talks about initiatives such as Additional Factor Authentication (AFA) [107] and Ombudsman Scheme for Digital Transactions[108] to protect users from the risks of FinTech. However, without digital financial literacy, these initiatives are not enough to safeguard users from the risks of FinTech. According to the Reserve Bank of India (RBI) annual report[109] for the year 2021, the number of fraud cases reported in the digital banking segment increased by 28% to 93,750 cases in 2020-2021 from 73,419 cases in 2019-2020. The total value involved in these frauds was INR 1.38 lakh crore (approx. USD 18.5 billion) in

[103] 'Financial Literacy and Inclusion in India' (National Centre for Financial Education 2019) <https://www.ncfe.org.in/reports/nflis>
[104] Ibid.
[105] Ibid.
[106] Ibid.
[107] Additional Factor Authentication (AFA) provides for a two-step authentication where at least one of the authentication methods is generally dynamic or non-replicable. The Reserve Bank of India has made it compulsory to use AFA for all digital payments, electric fund transfers, online banking, and ATM withdrawals; 'AFA Explained: How It Impacts Auto-Debit Payment As Per New RBI Guidelines' (IndiaTimes, 12 October 2021) <https://www.indiatimes.com/explainers/technology/what-is-afa-new-rbi-guidelines-explained-551180.html> accessed 17 January 2023
[108] The Ombudsman Scheme for Digital Transactions was introduced by the Reserve Bank of India in 2019 as a system for complaints redressal on deficiency in customer service in digital transactions made by customers. According to the scheme, the complainant must first file a complaint with the relevant service provider. If the complainant does not receive a response within one month or is dissatisfied with the response, he may register a complaint with the Ombudsman for Digital Transactions; Reserve Bank of India' <https://www.rbi.org.in/commonman/English/Scripts/PressReleases.aspx?Id=2846> accessed 17 January 2023
[109] Reserve Bank of India, Annual Report 2020-21, available at https://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/0RBIAR202021_F367650F6FBF4B319686D6FC985FEF2E.PDF (last visited March 21, 2023).

2020-2021, which is more than double the amount reported in the previous year.[110] The report also mentioned that fraud in online transactions accounted for a major share of the total fraud cases reported in the digital banking segment.[111] Additionally, the National Crime Records Bureau (NCRB) reported that there were 11,592 cybercrime cases registered under the Information Technology Act in India in 2020.[112]

[110] Ibid.
[111] Ibid.
[112] National Crime Records Bureau, 'Cyber Crime Cases Under Cyber Crime Head', in 'Crime in India 2020', Ministry of Home Affairs, Government of India (2021) http://ncrb.gov.in/en/crime-india-2020 accessed 21 March 2023.

G. Digital Inequalities leading to lack of Financial Inclusion in India

DiMaggio[113] et al and Hargittai[114] argue that for a long time, the inequalities in terms of the use of digital technologies were understood in terms of access i.e., the core digital divide. The digital divide is understood as the difference between haves and have-nots when it comes to hardware and connectivity without focusing on the uneven distribution of digital resources such as digital skills, which is also especially important to understand the aspects of digital inequality.[115]

According to DiMaggio[116] et al, demographic and socioeconomic factors affect the level and quality of the following factors while using digital services:

1. Hardware, software, and network connections
2. Autonomy of use
3. Skill
4. The availability of social support

These factors in turn affect the benefits and opportunities that are available to users, leading to a variety of outcomes in terms of both the quality of life and the benefits received.[117] Therefore, some users do not enjoy the same benefits, which created digital inequalities.[118] Studies mention numerous demographic factors including race, gender, socioeconomic class, and even the degree of urbanisation that affect the experience of users.[119]

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[113] Dimaggio P and others, 'Digital Inequality: From Unequal Access to Differentiated Use', *Social Inequality* (Russell Sage Foundation 2004) <http://www.scopus.com/inward/record.url?scp=84902901376&partnerID=8YFLogxK> accessed 22 September 2022

[114] Hargittai E, 'Second-Level Digital Divide: Differences in People's Online Skills' [2002] First Monday <https://firstmonday.org/ojs/index.php/fm/article/view/942> accessed 22 September 2022.

[115] Dutton WH (ed), *The Oxford Handbook of Internet Studies* (Oxford University Press 2013) <https://doi.org/10.1093/oxfordhb/9780199589074.001.0001> accessed 22 September 2022

[116] Dimaggio P and others, 'Digital Inequality: From Unequal Access to Differentiated Use', Social Inequality (Russell Sage Foundation 2004) <http://www.scopus.com/inward/record.url?scp=84902901376&partnerID=8YFLogxK> accessed 22 September 2022

[117] Ibid.

[118] Ibid.

[119] Thompson KM, 'Review of Virtual Inequality: Beyond the Digital Divide, Karen Mossberger, Caroline J. Tolbert, Mary Stansbury' (2004) 74 The Library Quarterly: Information, Community, Policy 217; Hargittai E, 'Second-Level Digital Divide: Differences in People's Online Skills' [2002] First Monday <https://firstmonday.org/ojs/index.php/fm/article/view/942> accessed 22 September 2022; Dimaggio P and others, 'Digital Inequality: From Unequal Access to Differentiated Use', Social Inequality (Russell Sage Foundation 2004) <http://www.scopus.com/inward/record.url?scp=84902901376&partnerID=8YFLogxK> accessed 22 September 2022

[119] Dutton WH (ed), *The Oxford Handbook of Internet Studies* (Oxford University Press 2013)

Beteille,[120] in his book titled 'Social Inequality' talks about three main aspects of social inequalities i.e., those which flow from disparities of income and wealth; those which relate to different honour or prestige; and those which derive from the distribution of power. Beteille mentions that Steven Runciman, following Max Weber, argues that these three dimensions of inequality are related but not reducible to each other.[121] Digital Inequalities can have similar reasons as social inequalities such as either social, cultural, economic disadvantages or a combination of all of them. Digital Inequalities have been defined as socio-economic disparities inside the 'online population'.[122]According to Max Weber, "Every technological repercussion and economic transformation threatens stratification by status and pushes the class situation into the foreground".[123] The term 'Digital Inequality' is the idea of the impact that social inequality has on Information and Communication Technology, not just in terms of access but a broader range of parameters.[124]

Digital Inequalities may also create barriers for certain populations to access and benefit from financial services, leading to exclusion from the formal financial system. Some of the factors that contribute to digital inequalities in FinTech include:

Lack of access to digital technologies: Low-income populations, rural communities, and certain demographic groups may have limited access to digital devices, internet connectivity, and digital literacy skills, which may prevent them from accessing and using FinTech services.[125]

Lack of digital literacy and skills: Some populations may have limited familiarity with FinTech, leading to mistrust or scepticism towards these services. This lack of trust can be worsened by concerns over data privacy and security.[126]

Occupation: Individuals in informal and low-paying jobs and those with limited financial resources may have limited access to digital technologies and financial products.[127]

[120] Beteille A (ed), Social Inequality (Penguin Books Ltd 1969)
[121] Ibid.
[122] Stiakakis E, Kariotellis P and Vlachopoulou M, 'From the Digital Divide to Digital Inequality: A Secondary Research in the European Union' in Alexander B Sideridis and Charalampos Z Patrikakis (eds), Next Generation Society. Technological and Legal Issues (Springer 2010).
[123] Barbalet JM, 'Principles of Stratification in Max Weber: An Interpretation and Critique' (1980) 31 The British Journal of Sociology 401
[124] DiMaggio P and Hargittai E, 'From the "Digital Divide" to "Digital Inequality": Studying Internet Use as Penetration Increases' (2001)
[125] Dijk J van, The Digital Divide (1st edn, Polity 2020) <https://www.perlego.com/book/1536601/the-digital-divide-pdf> accessed 13 March 2023
[126] Ibid.
[127] Ibid.

Gender and Age: Women often face lower rates of digital access and usage than men. This can limit their ability to access FinTech services and can reinforce gender disparities in financial inclusion. Age is also a significant factor, with older individuals often facing challenges in adopting modern technologies and lacking the necessary digital skills and knowledge to use FinTech products effectively.[128]

India has emerged as a significant player in the global FinTech market in recent years, but digital inequalities still pose significant challenges to financial inclusion in the country. Despite a rapidly growing digital economy, many Indians still lack access to the technology and infrastructure necessary to participate fully in the financial system.[129]

One major factor contributing to digital inequalities in India is the uneven distribution of internet connectivity.[130] While internet penetration has grown significantly in recent years, access to high-speed broadband is still limited in many rural areas, where a considerable proportion of the population lives.[131] This makes it difficult for people in these areas to access FinTech services such as mobile banking, online payments, and digital lending.

Another challenge is the lack of digital literacy and skills. Many people in India are not familiar with how to use digital devices and services, which can make it challenging for them to access and use digital financial products.[132] This is particularly true for older individuals and those with lower levels of education.[133]

In addition to these challenges, there are also issues with financial infrastructure and regulation that limit access to FinTech services. Many Indians still lack access to traditional banking services, which can make it difficult for them to access digital financial products.[134] There are

[128] Ibid.
[129] World Bank, 'Financial Inclusion in India' (2020) https://www.worldbank.org/en/topic/financialinclusion/brief/financial-inclusion-in-india accessed 21 March 2023
[130] Niti Aayog, Strategy for New India @ 75 (2018) https://niti.gov.in/sites/default/files/2019-04/Strategy_for_New_India_0.pdf accessed 21 March 2023
[131] Ibid.
[132] World Bank, 'Financial Inclusion in India' (2020) https://www.worldbank.org/en/topic/financialinclusion/brief/financial-inclusion-in-india accessed 21 March 2023
[133] Ibid.
[134] Deloitte, Indian FinTech: Powering a Digital Economy (2019) https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-indian-fintech.pdf accessed 21 March 2023

also regulatory barriers that make it challenging for FinTech companies to operate in certain markets, which can limit the availability of FinTech services in these areas.[135]

Financial inclusion in the Indian context refers to the process of ensuring that vulnerable groups, such as weaker sections and low-income groups, have access to the financial products and services they need at an affordable price fairly and transparently from mainstream institutional players.[136]

The survey[137] conducted by the National Centre for Financial Education also explored financial inclusivity in India and found that urban respondents had higher financial inclusion compared to rural ones; Male respondents were slightly higher financial inclusion compared to female respondents; Younger respondents (18-29) were less likely to be financially excluded compared to older ones; Respondents belonging to the General category had higher financial inclusivity compared to those from Oher Backward Class (OBC), Scheduled Caste (SC) and Scheduled Tribes (ST); More educated respondents had higher financial inclusion and government personnel were more financially integrated than those from other occupations; Respondents with higher incomes had greater financial inclusion.

Therefore, the socio-economic characteristics of an individual have a direct impact on how well users access FinTech services. Digital Inequalities limit access, which then leads to users being less financially included and more vulnerable to risks associated with FinTech.

[135] Ibid.
[136] 'NSFE 2020-25' <https://www.ncfe.org.in/reports/nsfe/nsfe2025> accessed 20 January 2023
[137] 'Financial Literacy and Inclusion in India' (National Centre for Financial Education 2019) <https://www.ncfe.org.in/reports/nflis>

H. Conclusion

India's FinTech sector is experiencing rapid growth; however, there appears to be a disproportionate increase in digital and financial literacy. India's government has created a supportive ecosystem for FinTech through various digital infrastructure initiatives. The country has implemented distinct legislation for Payment and Settlement Systems, facilitating the organized growth of its payment ecosystem. The growth in digital payments is attributed to the development of advanced electronic payment systems that enable smooth real-time or near-real-time money transfers. The introduction of mobile-based payment systems, such as the Bharat Bill Payment System and National Electronic Toll Collection, as well as the launch of Immediate Payment Service and Unified Payments Interface, has transformed the country's payments ecosystem and garnered international recognition. These payment systems have gained early acceptance due to their ease of use and presented customers with an alternative to using cash to make payments. Therefore, this led to the inclusion of non-bank FinTech businesses in the payment ecosystem in India.

However, relative to the rapid growth of FinTech, there is a significant shortage of digital financial education initiatives in India. Financial Literacy, which is the ability to make informed financial decisions, is crucial to avoid digital financial exclusion and protecting users from the risks of FinTech. The lack of financial literacy among Indian adults suggests they can be at heightened levels of vulnerability to financial scams and fraud. The growth of digitisation of finance and awareness of the risks are significantly lacking in India, posing a major issue. This results in a significant portion of the population, particularly those from low-income and underprivileged backgrounds, being unable to fully comprehend the use of FinTech services, their advantages, and the associated risks. This lack of understanding restricts their participation in the digital economy and their access to the financial products and services needed for their financial stability and prosperity. The Indian government seems to be only focusing on increasing the adoption of FinTech by creating a technology stack[138] and offering various infrastructures to create an ecosystem for FinTech while ignoring education about the risk of FinTech. Some studies[139] have warned against only focusing on growing FinTech

[138] D'Silva D and others, 'The Design of Digital Financial Infrastructure: Lessons from India' [2019] BIS Papers Series.

[139] Ravikumar T and others, 'Digital Financial Literacy Among Adults in India: Measurement and Validation' (22 March 2022) <https://papers.ssrn.com/abstract=4063775> accessed 17 January 2023; 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf; 'G20/OECD-INFE

without adequately addressing its negative effects and risks. However, the Indian regulators seem to be ignoring that warning and therefore exposing the users of FinTech services to risks associated with it.

Another challenge that India is facing in its FinTech sector is the lack of financial inclusion due to the existence of digital inequalities. Digital Inequalities can create barriers to financial inclusion in FinTech, particularly for marginalised groups such as low-income individuals, women, older people, and people with less education. Despite a rapidly growing digital economy, many Indians still lack access to the technology and infrastructure necessary to participate fully in the financial system, leading to users being less included in the FinTech sector and more vulnerable to the risks of FinTech. Today digital inequality not only reflects but also tends to reinforce social inequality.[140]

To overcome these challenges, the government of India should make digital financial education a priority, so that everyone in the country can take advantage of the advancements in financial technology. Regulators in India must implement actionable steps to develop financial education programs to improve financial literacy. Focusing on educating the population on important financial concerns could be considered a wise investment for the future because better levels of financial literacy are proven to correspond with decreased financial vulnerability.[141]

FinTech companies should educate their customers on digital payment safety guidelines, including how to spot and report fraudulent activities and use secure authentication methods to ensure that only the legitimate user can access the account. According to a report[142] by the Boston Consulting Group and PhonePe Pulse, service providers can create awareness among consumers through various methods such as seminars, webinars, video tutorials, and other interactive methods. They can provide regular updates on the latest cyber threats and the steps to be taken to protect themselves. They can also create user-friendly online security tools that can help customers identify and protect themselves against potential cyber threats and use customer feedback to identify potential vulnerabilities in their systems and take appropriate

Policy Guidance on Digital Financial Literacy - OECD' <https://www.oecd.org/finance/financial-education/g20-oecd-infe-policy-guidance-digitalisation-financial-literacy-2018.htm> accessed 17 January 2023

[140] Dijk J van, The Digital Divide (1st edn, Polity 2020) <https://www.perlego.com/book/1536601/the-digital-divide-pdf> accessed 13 March 2023

[141] Seldal MMN and Nyhus EK, 'Financial Vulnerability, Financial Literacy, and the Use of Digital Payment Technologies' (2022) 45 Journal of 334 Policy 281

[142] 'Digital Payments in India: A US$10 Trillion Opportunity' (Boston Consulting Group and PhonePe Pulse 2022) https://static.investindia.gov.in/s3fs-public/2022-06/future-of-digital-payments-in-india.pdf

steps to address them. FinTech companies can invest more in cybersecurity solutions and employ qualified cybersecurity experts to ensure that their systems remain secure.

Additionally, addressing digital inequalities in FinTech requires a multi-faceted approach, including policies and programs that improve access to digital technologies and promote digital literacy, as well as developing products and services that are inclusive and accessible to all populations. By taking these steps, India can ensure that everyone in the country can benefit from the advancements in financial technology, while also mitigating the associated risks.

In conclusion, addressing the challenges of digital financial education and digital inequalities is essential for India's FinTech sector to continue to grow sustainably and inclusively.

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