

**CBDC:**  
Expanding  
Financial  
Inclusion  
*or Deepening  
the Divide?*

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Exploring Design Choices that  
Could Make a Difference

## Appendix: Field Work Contexts

Prepared by **Dr. Anette Broløs & Dr. Erin Taylor**, *Finthropology*

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# Introduction

When studying the relationship between CBDC and their potential to address financial inclusion, a broad set of factors are at play, including economic characteristics, monetary policy, the reality and policies on financial inclusion, history of payment system changes, and CBDC projects. This section introduces the country settings of the thirteen individual research reports. The four countries—India, Indonesia, Nigeria, Mexico—are all emerging economies but with very different histories, economic statuses, monetary scopes and payments characteristics.

In this appendix, we give a very short introduction to each country followed by an overview table summarizing main indicators. Finally, we offer a deeper dive on the comparative sample features of our research, including each country's population and income level; access to Internet, identification, and financial infrastructure; financial ecosystem and payment environment; financial innovation initiatives; financial inclusion initiatives; and efforts toward launching CBDC.

## At a Glance

### India

India is a large country with a complex economy. India has 17% of the world's unbanked population and of the adult account holders, as many as two thirds have not made a digital merchant payment.<sup>1</sup> On the other hand, the government and the Reserve Bank of India have put in place major initiatives to build financial inclusion and an active digital economy, including the Indian stack, the Aadhaar ID, the Universal Payments Interface (UPI) for instant and interoperable payments, and an active fintech environment. A CBDC is expected in the budget year 2022-2023.

### Indonesia

Indonesia is home to 7% of the world's unbanked population, corresponding to almost half of the country's adult population.<sup>2</sup> The Bank of Indonesia and the Indonesian Financial Services Authority have put in place initiatives to build a digital economy,

including the Indonesian identification card KTP, e-money and digital banking regulation, the interoperable QR code payment system QRIS, and an open banking environment. The Bank of Indonesia is exploring the possibility of a CBDC. The country hosted a Tech Sprint in collaboration with the BIS in 2022, which included a financial inclusion challenge. The winning solution would secure interoperability between online and offline CBDC transactions.

### Nigeria

Nigeria is a lower middle-income country with a large informal sector and low rate of financial inclusion. This is despite a series of financial inclusion policies and initiatives to promote digital payments. In 2021 Nigeria introduced a CBDC, the eNaira, to fulfill several goals in financial development and stability as well as to promote financial inclusion. The adoption was slower than expected despite the fact that it offered customers the possibility to create an eNaira wallet without an official ID or a bank account. Factors including low trust in government, poor communication around the rollout, and technical issues with the wallet app also affected the low uptake. The second phase was introduced in August 2022 with the specific goal of onboarding unbanked and underserved groups.

### Mexico

Mexico is an upper middle-income country with well developed financial regulation and the second largest fintech ecosystem in Latin America. In 2021, Mexico was the third largest receiver of remittances in the world, of which 95% came from the US. Four percent of households in Mexico receive remittances.<sup>3</sup> Financial literacy is low, at 32%<sup>4</sup> and so is access to financial accounts for the adult population (68%).<sup>5</sup> A financial inclusion policy is in place. One particular goal is the movement towards digital payments with the introduction of CoDi. The Central Bank of Mexico has announced the introduction of a retail CBDC in 2025. It is envisioned to be flexible, operating with an account-based system that can work in parallel to a token-based system, thus meeting different user needs.

# Key Financial Indicators

		India	Indonesia	Mexico	Nigeria
<b>GDP</b>	Aggregate	\$3,173b	\$1,186b	\$1,293b	\$441b
	Per Capita 2021	\$2,277	\$4,292	\$9,926	\$2,085
<b>Monetary</b>	Rate	4%	3.5%	4.75%	11.5%
	Mandate	Employment, growth, BoP	Low and stable price inflation	Low inflation, exchange rate	Stable prices, exchange rate
<b>Identification</b>		National: The Aadhaar: nique, free, biometric I	National: KTP	Several. Personal Identification CURB and tax registration RFC	Two National IDs: NIN and e-ID token + banking BVN ID
<b>Access</b>		97%	90%	36.9%	42%
<b>Inclusion</b>	Policy	National policy	National policy	National policy	C.B. strategy
	Access to account	78%	52%	58%	45%
	Financial literacy	24%	32%	32%	26%
<b>Payments</b>	Cash at POS	37%	51%	41%	63%
	Most important types	Cards, mobile/wallets	Mobile/wallets, cards, bank transfers, cash on delivery (COD)	Cards, mobile/wallets	Cards, bank transfers, cash on delivery (COD)
	National initiatives	Several. Most important: Unified Payments Interface (UPI) real-time P2P and P2M payments	The Indonesian Standard for Quick Response Codes (QRIS)	Two separate initiatives: The SPEI for real-time payments and Cobro Digital (CoDI) for inclusion Qr-code based	Framework for Quick Response Code Payments based on QR codes and the eNaira
<b>CBDC</b>	Stage	Planned 2022-23	Exploratory	Planned 2025	Launched and phase 2 started autumn 2022
	Goals	Monetary policy, financial stability, efficient operations of currency and payment systems	Monetary sovereignty, being part of international initiatives; integration of the national digital economy and financial system, financial inclusion	Financial inclusion as top stated goal, as well as fast payment options, and economic efficiencies.	Improved monetary and financial stability policies Financial inclusion Empowerment and poverty reduction

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# Comparative Sampling Features Across Country Cases

In the following descriptions we focus on the financial system, existing payment habits and the current plans for CBDC. This provides the background for understanding the payment behaviors described in the user research.

## India

India is a large country with a complex economy. India is home to 17% of the world's unbanked population, and among adult financial account holders, as many as two-thirds have not made a digital merchant payment.<sup>7</sup> On the other hand, the government and Reserve Bank of India have put in place major initiatives to build financial inclusion and an active digital economy, including the Indian stack, the Aadhaar ID, the Universal Payments Interface (UPI) for instant and interoperable payments and an active fintech environment. India's CBDC, the digital rupee, is set to commence for the wholesale segment in November 2022.<sup>8</sup>

### Population and Income level

India has a population of 1,393 million people, of which 35% live in urban areas.<sup>9</sup> It is a lower middle-income country with a GDP of USD 2,277 per capita.<sup>10</sup> 76% of India's working population is employed in the informal sector.<sup>11</sup>

26% of the population are under the age of 15, so they do not have their own financial accounts.<sup>12</sup> In 2021, India had an estimated immigrant population of 5.2 million, or 0.4% of the total population.<sup>13</sup>

### Access to ID, internet and financial infrastructure

In 2021, 97% of adult Indians had an ID.<sup>14</sup> This is the result of a 2008 government initiative to introduce a unique free biometric identification, the Aadhaar. The ID solution is available for Indian citizens regardless of age and can be accessed both online in a mobile version and as an offline version. It is managed by the Unique Identification Authority of India (UIDAI). The introduction

of the ID helped increase the access to financial accounts from just 35% of adults in 2011 to 80% in 2017.<sup>15</sup>

Only 28% of the population had access to the internet in 2021. However, 66% owned a mobile phone.<sup>16</sup>

In 2021, 78% of Indians held a bank or fintech account.<sup>17</sup> There is no discernible gender gap or gap between urban and rural areas with regard to financial accounts. A government program paying benefits to women into their own personal account has supported this development.<sup>18</sup>

Among account holders, one third (35%) had at least one inactive account, including more women than men, and more people in rural areas than in urban areas. Among the reasons cited were distance to bank branches, lack of trust in financial institutions, and no need for an account. This adds perspective to the government initiatives to pay benefits through financial accounts.<sup>19</sup> If there is no trust in the "system," such an initiative will be a practical barrier rather than a solution.

Only 27% of Indian citizens had debit cards and only 5% had credit cards in 2021.<sup>20</sup> Only 35% of adults had made or received a digital payment. Predictably, this rate was slightly higher among men than women (41% vs. 28%) and in urban areas (40% vs 30% in rural areas).<sup>21</sup>

24% of adults in India had savings in 2021 and 45% had borrowed at some time, though mostly from friends and family.<sup>22</sup> Two percent had owned or used cryptocurrencies in 2021.<sup>23</sup>

Personal international remittances to India amounted to just under USD 100 million, or 3% of GDP in 2020.<sup>24</sup>

### Financial ecosystem and payment environment

The government of India has been an important driver in the push towards digital payments.<sup>25</sup> The first digital system (NEFT) was introduced in 2005 to allow firms to transfer funds to indi-

viduals and other firms. In 2019 it was made available around the clock. This was followed by the Immediate Payment Service (IMPS) in 2021, enabling inter-bank electronic transactions through mobile phones, 24/7.

In April 2016, India launched the Unified Payments Interface (UPI) to facilitate real-time P2P and P2M payments. It is available through a mobile app in which users identify themselves with a telephone number and a virtual payment address (VPA) of their choice or a QR code. The application requires users to have a bank account that is connected either directly or via a bank card. Since March 2022, UPI has also been made available to users of non-smart mobile phones. The UPI is regulated by the central bank, enabled on mobile, and supports international transactions in Singapore, Malaysia, Bhutan and UAE. As of August 2022, the UPI has seen the participation of 346 banks and has recorded 6.6 billion monthly transactions, worth over USD 131.5 billion.<sup>26</sup>

Payment initiatives further include the e-Rupi, a person- and purpose-specific digital payments instrument that allows for contactless and cashless payments. They also include the Bharat Bill Payment System (BBPS), which offers interoperable and accessible bill payment service to consumers via digital (bank) channels as well as through a network of agents and bank branches.

Payments in India (2021)		
Means of payment	% at point of sale	% of e-commerce
Cash	37%	-
Cash on delivery	-	9%
Digital/mobile wallet	25%	45%
International credit cards	18%	13%
National credit cards	18%	13%
Debit cards	18%	15%
Bank transfers	-	12%
Other	2%	6%

Source: Worldpay for FIS: The Global Payments Report for Financial Institutions and Merchants, 2022

## Payments

Cash still plays an important role, accounting for 37% of sales value at the point of sale. Cards are responsible for 36% of PoS sales value, with mobile payments and wallets following up with 25%. In the e-commerce market, mobile payments and wallets amount to almost half of payments, with cards in second place at 28%. Cash on Delivery represents 9% of the payment volume. In 2020, 13% of credit card transactions (PoS and ecommerce together) were made with local cards (Rupay).

## Financial environment

India has a complex banking system, including 12 public sector banks, 21 Private sector banks, 12 Small Finance Banks, four Payments banks, 43 Regional Rural Banks, 45 Foreign Banks and 1458 cooperative banks.<sup>27</sup>

Paytm is one of the four payments banks and is set to become a 'super app,' integrating e-commerce, entertainment and internet services with financial services (including payments, loans, investments, and insurance) on the same platform.<sup>28</sup>

In 2022-2023, the Reserve Bank of India is planning to open 75 digital banks in 75 regions of India. These banks will be paperless. The objective is to ensure that the benefits of digital payments, banking and fintech innovations reach the grassroots of India in a consumer friendly manner. In addition to banking business, they will also function as financial literacy centers.<sup>29</sup>

The fintech environment is well developed and supported by the Reserve Bank of India (see below). This environment covers more than 2100 companies, of which two-thirds were established in the last five years. It includes 21 unicorns. Total investment over time is estimated at USD 21 billion in 2021.<sup>30</sup>

## Financial innovation initiatives

IndiaStack is a set of APIs that allows governments, businesses, startups and developers to utilize a unique digital Infrastructure to move the country towards presence-less, paperless, and cashless service delivery. The individual components are built and operated by different organizations. Some of the initiatives include the Aadhaar biometric ID, the eKYC solution and the UPI.<sup>31</sup>

To enable regulated and orderly growth of the fintech ecosystem in India, in 2019 the Reserve Bank created a sandbox in which eligible entities can live-test their innovative products or services in a controlled environment. This is a collaboration between the regulator, the innovators, the financial service providers and the end users. The theme of the first cohort was retail payments. The sandbox framework was updated in 2020 with the launch of the second cohort on cross-border payments. This included a blockchain-based cross-border payment system. The theme for the third cohort was lending to small and medium size companies (MSME lending). The fourth cohort was recently announced, with a focus on prevention and mitigation of financial fraud.<sup>32</sup>

The Reserve Bank also started an Innovation Hub in August 2020.<sup>33</sup> In 2021, the Reserve Bank launched a global Hackathon with a focus on smarter digital payments, called HARBINGER 21. It aimed to source solutions to four problem statements around digital payments to underprivileged consumers: non-mobile digital payments for small ticket cash transactions, context-based non-physical retail payments, alternative authentication, and social media-based fraud monitoring.<sup>34</sup>

## Financial inclusion

Financial literacy in India is measured as low, with only 24% of adults considered to be financially literate.<sup>35</sup> Financial inclusion<sup>36</sup> has, however, been a national focus since the late 1950s with different initiatives.

Currently, financial inclusion is driven by the National Strategy for Financial Inclusion 2019-2024 (NSFI) and the National Strategy for Financial Education 2020-2025 (NSFE). These strategies aim to provide access to formal financial services in an affordable manner, broadening and deepening financial inclusion and promoting financial literacy and consumer protection.

Progress is measured in three broad areas (1) Access (digital and physical points of service) (2) Usage (bank account, credit, insurance, digital transactions, frequency of bank usage and remittances) and (3) Quality (financial literacy and grievance redressal).

## CBDC

The Reserve Bank of India has considered the potential of introducing a CBDC for some time. The Finance Bill for 2022-23 includes a budget for legal adjustments and the implementation of a CBDC. In its Annual Report, the Reserve Bank of India states:

*"The Reserve Bank has been exploring the pros and cons of introduction of CBDC in India. The design of CBDC needs to be in conformity with the stated objectives of monetary policy, financial stability and efficient operations of currency and payment systems. Accordingly, the appropriate design elements of CBDCs that could be implemented with little, or no disruption are under examination. The introduction of CBDC has been announced in the Union Budget 2022-23 and an appropriate amendment to the RBI Act, 1934 has been included in the Finance Bill, 2022. The Finance Bill, 2022 has been enacted, providing a legal framework for the launch of CBDC."<sup>37</sup>*

As this statement shows, the Reserve Bank's primary concerns in pursuing CBDC are monetary policy, financial stability, efficient operations of currency and payment systems. A recent paper from the BIS further shows that potential consequences in the form of financial system disintermediation are being considered.<sup>38</sup> There is no specific mention of financial inclusion.

The Reserve Bank of India has launched various pilot of its CBDC, the e-rupee, at the end of 2022: the wholesale e-rupee as of Nov. 1, 2022, involving nine banks; and the retail e-rupee as of Dec. 1, 2022, involving a closed user group of customers and merchants across select locations.<sup>39</sup>

# Indonesia

Indonesia is home to 7% of the world's unbanked population, corresponding to almost half the adult population.<sup>40</sup> The Bank of Indonesia and the Indonesian Financial Services Authority have put in place initiatives to build a digital economy, including the Indonesian identification card KTP, e-money and digital banking regulation, the interoperable QR code payment system QRIS, and an open banking environment. The Bank of Indonesia is exploring the possibility of a CBDC. The country hosted a Tech Sprint in collaboration with the BIS in 2022, which included a financial inclusion challenge. The winning solution would secure interoperability between online and offline CBDC transactions.

## Population and Income level

Indonesia has a population of 276 million people, of which 57% live in urban areas.<sup>41</sup> It is a lower middle income country with a GDP of USD 1,186 per capita. 80% of Indonesia's working population is employed in the informal sector.<sup>43</sup>

26% of the population are under the age of 15<sup>44</sup> and so do not have their own financial accounts.

0.1% of the population, or 28 million people, are migrants.<sup>45</sup>

## Access to ID, internet and financial infrastructure

In 2021, 90% of adult Indonesians had an ID.<sup>46</sup> The Indonesian identification card KTP is issued from the age of 17 or at marriage and is valid for life. Since 2011, it has existed in a digital form, the e-KTP.<sup>47</sup>

Only 51% of the population had access to the internet in 2021, though 73% had a mobile phone.<sup>48</sup>

In 2021, 52% of Indonesians had a bank or fintech account, an increase from 20% in 2011. Access did not vary much by gender, but was a little higher (55%) in urban areas than in rural areas (46%).<sup>49</sup>

Among financial account holders, 17% had at least one inactive account. The reasons cited included distance to bank branches,

lack of trust in financial institutions and no need for an account.<sup>51</sup> In 2021, 35% of Indonesians had debit cards and only 2% had credit cards.<sup>52</sup> Only 37% of adults had made or received a digital payment. This rate was similar between genders but slightly higher in urban areas (41%) than in rural areas (29%).<sup>53</sup>

49% of adults in Indonesia had savings in 2021 and 42% had borrowed at some time, though mostly from friends and family.<sup>54</sup> Though buying, selling and trading cryptocurrencies is illegal in Indonesia, 4% had owned or used cryptocurrencies in 2021.<sup>56</sup>

Personal international remittances to Indonesia amounted to 4% of GDP in 2020.<sup>57</sup>

## Financial ecosystem and payment environment

The Bank of Indonesia has provided initiatives in the payments area over the last decade. The drive toward a more digital economy has been important and has included a financial inclusion goal of access to bank accounts. The Bank of Indonesia introduced the National Non-Cash Movement (GNNT) in 2014, including initiatives such as forced non-cash payment at toll roads. In 2019, the Bank of Indonesia launched a 2025 vision for the payment system. This vision included five initiatives: (1) realizing open banking and API standardization to connect fintech and banking, (2) introduction of a National Payment Gateway (NPG), (3) development of financial market infrastructures, (4) introduction of national data structures, and (5) acceleration of the digital economy.

The first regulation around e-money was introduced in 2009 and updated in 2012 and 2018,<sup>58</sup> imposing stricter requirements on capital and national ownership as well as introducing a distinction between closed or open loop solutions, depending on whether payments can be used outside the platform.

The Indonesian Standard for Quick Response Codes (QRIS) was also introduced in 2019 to ensure greater interoperability between different payment platforms.<sup>59</sup> It is a standardized QR code that facilitates all payments, even when using different payment instruments.<sup>60</sup> The QRIS is currently being extended throughout Asia.<sup>61</sup>

## Payments in Indonesia (2021)

Means of Payment	% at point of sale	% of e-Commerce
Cash	51%	-
Cash on delivery	-	14%
Digital/mobile wallet	19%	39%
International credit cards	12%	10%
National credit cards	12%	10%
Debit cards	12%	7%
Bank transfers	-	23%
Other	6%	7%

Source: Worldpay for FIS: The Global Payments Report for Financial Institutions and Merchants, 2022

### Payments

Cash still plays an important role, accounting for 51% of sales value at the point of sale. Cards account for 24%, and mobile payments and wallets follow at 19%. In the e-commerce market, mobile payments and wallets amount to 39% of payments, with bank transfers in second place at 23%. Cash on Delivery represents 14% of payment volume and cards represent 17%. In 2020, 17% of credit card transactions were made with local cards (including GPN and JCB). It is clear that wallets are taking an important place in the Indonesian payment system.

### Financial environment

Indonesia has a growing financial environment that includes 107 commercial banks,<sup>62</sup> 1500 rural banks and 26 regional banks.<sup>64</sup> Of these, just under 200 organizations follow Sharia law.<sup>65</sup>

Around 20 banks are pure digital players started by existing banks or technology companies, with Jenius by BTPN in the lead. They require a full banking license and the Bank of Indonesia has strengthened capital and liquidity requirements (most recently in 2021).<sup>66</sup>

The early adoption of e-money regulation has resulted in the existence of 55 licensed e-money institutions in 2022, of

which 14 are commercial banks and the rest are fintechs, big techs or platforms. Before the introduction of wallets, Indonesia already had a tradition of buying mobile phone subscriptions by “topping up” phones from the most attractive offer. Subscriptions could be purchased at an agent counter, online or through various apps using just the phone number. This type of “topping up” is also used for services such as electricity, water and pre-paid cards.<sup>67</sup>

A digital wallet can either be a stand-alone app or be part of the menu of a commercial platform. In spite of the many licenses in the market, there is a marked concentration in the use of the e-wallet with GoPay (part of Gojek) as the dominant player, followed by OVO, LinkAja and Dana.<sup>68</sup> Most wallets offer both a freemium version that can be opened with just a phone number and a premium version that requires a full ID and a bank account.

Besides banking, Indonesia has a growing fintech environment focused on lending, payments and cryptocurrencies.<sup>69</sup>

### Financial innovation initiatives

As part of the overall plan to develop Indonesia as a digital growth economy, the Bank of Indonesia introduced a fintech office and a regulatory sandbox in 2017.<sup>70</sup> Recently (August 2021) BI launched an open banking standard (SNAP) in collaboration with the Indonesia Payment System Association (ASPI) and started trials of QRIS and Thai QR Payment interconnectivity in the regulatory sandbox.<sup>71</sup>

### Financial inclusion

Financial literacy in Indonesia is low, with only 32% of adults considered to be financially literate.<sup>72</sup> In 2020, the Financial Services Authority (OJK) introduced its third financial inclusion strategy (SNKI) for 2021-2025. The second program, launched in 2017, included initiatives such as branchless banks, the use of agents to help people deposit and withdraw money, and limitations in the disbursement of monetary aid in cash. The goal was to reach 25% access to bank accounts among the adult population in 2019.<sup>73</sup> The new plan has three pillars: (1) financial competence, (2) access to finance and (3) a wise financial attitude and behavior. It sets further goals for inclusion of 10 vulnerable groups. Financial inclusion is also part of the rationale for the introduction of a retail CBDC.

## CBDC

The Bank of Indonesia has been exploring CBDC for several years. The goals and premises of this exploration were described in a BIS paper from 2022<sup>74</sup> and recently expanded upon by presentations in October 2022.<sup>75</sup>

Three key drivers are mentioned in the BIS paper: monetary sovereignty, being part of international initiatives, and spurring the integration of the national digital economy and financial system. This means that central banks must aim for an optimal CBDC design to meet policy objectives and public needs while also mitigating risk. The paper stresses that well-designed retail CBDC could help overcome financial inclusion barriers, including by providing offline capabilities, low-cost transactions and data portability. This does not, however, mean that financial inclusion should await the introduction of a CBDC. Finally, a CBDC must support interconnectivity, interoperability and integration in financial markets. The paper also identifies three important components of a future financial system: (1) a wholesale CBDC to accommodate transactions between the central bank and financial institutions, (2) retail CBDC and fast payments for the public, and (3) multi-CBDC arrangements for cross-border payments.

In 2022, the Bank of Indonesia continued its exploration of CBDC by publishing a conceptual design for the digital rupiah to support the digital payment system and accelerate international cooperation on CBDC in the G20 forum. This effort included a collaboration with the BIS Innovation Hub to run a Tech Sprint on CBDC development. The key challenges were: (1) to build an effective and robust CBDC including new capabilities like programmability and innovative services to customers, (2) to enable financial inclusion and (3) improving interoperability in the payment system. It is noteworthy that financial inclusion was a key subject of this first tech sprint. Winning projects included an end-to-end CBDC solution that includes features like a mobile wallet and digital identity platform, a secure offline CBDC payment solution that supports interoperable CBDC, and a blockchain-based CBDC network that supports both account- and token-based CBDC models.

# Nigeria

Nigeria is a lower middle-income country with a large informal sector and a low rate of financial inclusion. This is despite a series of financial inclusion policies and initiatives to push digital payments. In 2021 Nigeria introduced a CBDC, the eNaira, to fulfill several goals in financial development and stability as well as financial inclusion. The adoption was slower than expected despite the fact that users had the possibility to create an eNaira wallet without an official ID or a bank account. The second phase was introduced in August 2022 with the specific goal of onboarding unbanked and underserved groups.

## Population and income level

Nigeria has a population of 211 million people, of which 53% live in urban areas.<sup>76</sup> It is a lower middle-income country with a GDP of USD 2,085 per capita.<sup>77</sup> In 2021, 58% of Nigeria's GDP came from the informal economy.<sup>78</sup> In 2018, however, the ILO estimated that 98% of all employment in Nigeria was informal,<sup>79</sup> with around half of people being self-employed and most employed in vulnerable working conditions.

43% of the population are under the age of 15 and so do not have their own financial accounts.<sup>80</sup>

0.7% of the population are migrants.<sup>81</sup>

## Access to ID, internet and financial infrastructure

The Nigerian government is pushing the adoption of two different identification numbers. The National Identification Number (NIN) can be issued to all residents regardless of age and by September 2022 had been adopted by 42% of the population. The other form of ID is an e-ID token that holds the NIN embedded in the e-ID chip. This is already usable for identification, travel purposes, security and some payments. The plan is to enable its use for voting, health and pension purposes, as well as taxation and drivers' licenses.<sup>82</sup>

Nigeria also features a Bank Verification Number (BVN), which is used across all financial institutions in Nigeria. It is mapped to a person's identity with a fingerprint, signature and photo.<sup>83</sup>

Only 25% of the population had access to the internet in 2021,<sup>84</sup> while 73% had owned a mobile phone.<sup>85</sup>

In 2021, 45% of Nigerian adults had a bank or fintech account. This varied widely by gender, with 55% of men and only 35% of women.<sup>86</sup> Among account holders, 10% had at least one inactive account. 56% of adults had saved at some point, but only 18% did so in a financial account.<sup>87</sup> 10% had owned or used cryptocurrencies in 2021.<sup>88</sup> This is one of the highest levels globally.

In 2021, 35% of Nigerians had debit cards and only 2% had credit cards, yet more than half of adults (men and women) had borrowed at some point, though mostly from family and friends. For debit card access, there was a marked difference between men (45%) and women (26%).<sup>89</sup> Only 34% of adults had made or received a digital payment. Here again there was a notable difference between men (45%) and women (23%) and between urban (41%) and rural (24%) dwellers. Among the poorest 40% of the population, only 20% of adults had made or received a digital payment.<sup>90</sup>

Personal international remittances to Nigeria amounted to 4% of GDP in 2020.<sup>91</sup>

## Financial ecosystem and payment environment

In 2014, The Central Bank of Nigeria introduced the NIBSS Instant Payments (NIP) system for electronic funds transfers between banks and other institutions via ATM, mobile, internet and POS systems.<sup>92</sup>

In January 2021, the Central Bank of Nigeria introduced a framework for payments based on QR codes. The framework provides an interoperable standard with the aim of ensuring stability in the financial system, promoting the use and adoption of electronic payments and strengthening innovation in the payments system.<sup>93</sup>

### Payments

In 2021, just before the introduction of the eNaira, cash still dominated payments at the point of sale, comprising almost two-thirds of transactions. In e-commerce, bank transfers and cash on delivery were the most prominent means of payment (26%

and 20%, respectively). Lack of trust in intermediaries is part of the reason for this dominance over cards and wallets. Credit and debit cards take almost equal shares of both point of sale transactions and e-commerce, despite the very low percentage of Nigerians who hold a credit card. In 2020, 38% of credit card transactions were made with local cards (Verve).

Payments in Nigeria (2021)		
Means of Payment	% at point of sale	% of e-Commerce
Cash	63%	-
Cash on delivery	13%	20%
Digital/mobile wallet	-	8%
International credit cards	4%	18%
National credit cards	4%	18%
Debit cards	8%	19%
Bank transfers	-	26%
Other	12%	9%

Source: Worldpay for FIS: The Global Payments Report for Financial Institutions and Merchants, 2022

### Financial environment

The Nigerian Central Bank divides the financial services system into two parts: the formal system and the informal system.

Commercial Banks or Deposit Money Banks (DMB) form the core of the formal system and the financial intermediation. Nigerian commercial banks are divided into two categories: indigenous banks (100% owned by Nigerians) and mixed banks (with 60% owned by Nigerians). There are currently 24 commercial banks. The formal system also includes 20 finance companies (FCB) providing a wide range of specialized services as well as six merchant banks and a number of mortgage institutions and development banks.<sup>94</sup> The development banks are specialized financial institutions that provide long-term finance to support the growth and development of small and medium enterprises as well as underserved and regional markets (community development banks and regional development banks).

The informal system consists of a variety of actors including local money lenders, money changers, pawn brokers, and thrifts and savings associations. These are not bound by governmental regulations as they operate outside the state financial structures. They are mostly small-scale operators and serve the financial needs of the unbanked population and people in the informal employment sector. Savings associations are well known in underserved areas. They are associations of two or more people who come together to contribute money or goods to a common fund. The association lends money (at interest) to interested customers, who then use the money to either invest or start up new businesses. Other services may include giving a partial or total amount of contributions to each contributor on a regular basis. Members make regular contributions to an agent who comes directly to them to collect their cash on an agreed upon schedule, usually daily.<sup>95</sup>

The Nigerian fintech environment is growing. It includes 13 digital banks and mainly focuses on consumer lending and payments. There are also about 40 payment service solution providers active, as well as a number of non-bank mobile money operators.<sup>96</sup>

### Financial innovation initiatives

The Central Bank of Nigeria has explored open banking strategies since 2018. In 2021, the bank issued a regulatory framework for open banking,<sup>97</sup> including standards for APIs, an open banking registry, targets for customer experience, data protection, and risk management. The Central Bank also issued the framework for a regulatory sandbox in January 2021.

### Financial inclusion

Financial literacy in Nigeria is low, with only 26% of adults considered to be financially literate.<sup>98</sup> The Central Bank of Nigeria introduced its first financial inclusion strategy in 2012. The NFIS was built on four strategic areas: agency banking, mobile banking/mobile payments, linkage models and client empowerment. Four priority areas were identified for guideline and framework development: tiered KYC regulations, agent banking regulations, a national financial literacy strategy, and consumer protection. The strategy sets a number of specific targets, including 70% of the adult population into the formal financial services sector and 10% included in the informal sector by 2020. By

2019, this was raised to a target of 95% in 2024.<sup>99</sup>

Five steps that the Central Bank considers most crucial to increasing financial inclusion in Nigeria are:

1. Creating an enabling environment for the expansion of DFS.
2. Enabling the rapid growth of agent networks with nationwide reach.
3. Harmonizing KYC requirements for opening and operating accounts/mobile wallets on all financial services platforms.
4. Creating an enabling environment to serve the most excluded.
5. Improving the adoption of cashless payment channels, particularly in government-to-person and person-to-government payments.<sup>100</sup>

Finally, one of the strategy's targets was to reduce financial exclusion in Nigeria to 20% by 2020, from the 2012 level of 46.3%.

## CBDC

Nigeria launched the first phase of the eNaira in October 2021, making it one of the first countries, and the first African country, to implement a retail CBDC. The stated goals of the eNaira are:

- Improved monetary and financial stability policies
- Financial inclusion
- Empowerment and poverty reduction
- Growth in cross border trade
- Improved foreign exchange position

The eNaira architecture is a two-tier retail CBDC model with financial institutions and registered agents acting as intermediaries.

Accessing the eNaira starts by downloading the eNaira wallet. For consumers, there are four levels of access, allowing higher levels of transactions with increasing identification (KYC). The lowest level is open to customers without a bank account, requiring no ID and simply a mobile phone. The next level requires the simple NIN ID as well as a mobile phone number. The last two levels both require a bank account and a bank identification (BVN).

Despite this effort to introduce the eNaira via broad accessibility, adoption proved difficult. Lack of trust in financial institutions, lack of ID and lack of financial accounts are some of the reasons.

However, in August 2022, the Central Bank of Nigeria published new data showing some uptake in adoption with 840,000 downloads of the eNaira app and active use by about 270,000 digital wallets, of which roughly 252,000 are consumer wallets and roughly 17,000 are merchant wallets.<sup>101</sup>

The Central Bank further announced that the eNaira's second phase is now in progress and is intended to drive financial inclusion by onboarding unbanked and underserved users, leveraging offline channels. One new initiative will be the possibility to open an eNaira wallet and conduct transactions by simply dialling \*997 from a mobile phone. Another possibility will be for merchants and consumers with bank accounts to use the NIBSS Instant Payment (NIP) to transfer and receive eNaira to any bank account. The target for this second phase is to reach eight million active users.<sup>102</sup>

# Mexico

Mexico is an upper middle-income country with well developed financial regulation and the second largest fintech ecosystem in Latin America. In 2021, Mexico was the third largest receiver of remittances in the world, of which 95% came from the US. Four percent of households in Mexico receive remittances.<sup>103</sup> Financial literacy is low, at 32%<sup>104</sup> and so is access to financial accounts for the adult population (68%).<sup>105</sup> A financial inclusion policy is in place. One particular goal is the movement towards digital payments with the introduction of CoDi.<sup>106</sup> The Central Bank of Mexico has announced the introduction of a retail CBDC in 2025. It is envisioned to be flexible, operating with an account-based system that can work in parallel to a token-based system, thus meeting different user needs.

## Population and income level

Mexico has a population of 130 million people, of which 81% live in urban areas.<sup>107</sup> It is an upper middle-income country with a GDP of USD 9,926 per capita.<sup>108</sup> In 2021, 57% of the population were employed in the informal sector.<sup>109</sup>

25% of the population are under the age of 15 and so do not have their own financial accounts.<sup>110</sup> 0.9% of the population are migrants.<sup>111</sup>

## Access to ID, internet and financial infrastructure

In 2021, 89% of adult Mexicans had an ID.<sup>112</sup> Mexico has several ID types. The Single Population Registration Code (CURP) is an 18-digit electronic or physical card issued for both Mexicans and international residents. Mexico also has a tax identification code, the RFC, which is available for both individuals and businesses.<sup>113</sup> In 2021, the Mexican parliament passed a law to require identification of all Mexican citizens via a biometric solution. This was, however, paused due to protests over access to personal data. In 2022, the Mexican Supreme Court ruled against the solution.<sup>114</sup>

71% of the population had access to the internet in 2020<sup>115</sup> and 78% owned a mobile phone.<sup>116</sup>

In 2021, 68% of adult Mexicans had some form of bank or fintech product. There is a pronounced gender gap, as 74% of men used financial services with only 62% of women doing the same.<sup>117</sup> 49% had a formal savings account (56% of men and 43% of women).<sup>118</sup> 11% of Mexicans had a credit card: 13% of men and 9% of women.<sup>119</sup> 3% had owned or used cryptocurrencies in 2021.<sup>120</sup>

In 2021, Mexico was the third largest receiver of remittances in the world, of which 95% came from the US. 4% of households in Mexico receive remittances.<sup>121</sup> Personal international remittances to Mexico amounted to just under USD 52 billion, or 4% of GDP, in 2021.<sup>122</sup>

## Financial ecosystem and payments

The central bank of Mexico introduced a long-term vision for payments in 2021,<sup>123</sup> based on the principle that all Mexicans should have the possibility of sending and receiving secure, immediate, low-cost, efficient and available-at-any-time electronic payments.<sup>124</sup>

The Mexican Central Bank regulates the monetary and payments systems. In 2004, it introduced the SPEI, an electronic funds transfer system allowing participants to transfer money in real time for both large-value payments and low-value transactions such as payroll and P2P transfers. SPEI is a hybrid system which clears operations every few seconds, and the results are settled immediately on participants' cash accounts.<sup>125</sup>

In January 2019, the Central Bank announced a new payments system through QR codes. The system, called Cobro Digital or CoDi, is part of the Government's efforts to increase financial inclusion and reduce the cash economy. CoDi's customer users must have a smartphone and a level 2 bank account (accounts that can be opened with customer's basic information). Sellers must have a static QR Code and either a smartphone to download the CoDi app (for face-to-face transactions) or a web page to generate CoDi requests for online sales.<sup>126</sup>

## Payments in Mexico (2021)

Means of Payment	% at point of sale	% of e-Commerce
Cash	41%	-
Cash on delivery	-	3%
Digital/mobile wallet	7%	27%
International credit cards	22%	35%
National credit cards	22%	35%
Debit cards	24%	19%
Bank transfers	-	8%
Other	6%	8%

**Source:** Worldpay for FIS: The Global Payments Report for Financial Institutions and Merchants, 2022

### Payments

Cash is still the most important means of payment at the point of sale, amounting to 41% of transactions in 2021. Debit and credit cards followed closely with 24% and 22%, respectively. In online commerce, credit cards dominate with 35% of sales, now followed closely by digital and mobile wallets (27% of payments), whereas debit cards only account for 19%.<sup>127</sup>

### Financial environment

The Mexican banking environment is composed of a number of different institutions. There are 50 commercial banks, with only seven of these taking almost 80% of total assets. Only one of these banks is national: Banorte. Mexico also has seven government-owned development banks which primarily provide lending to underserved banking segments, including SMEs.<sup>128</sup>

In 2018, the Mexican government introduced a fintech regulation allowing the authorization of fintechs in the areas of crowdfunding and P2P lending, electronic money and payment services, virtual assets and APIs. There are currently over 550 fintechs operating in Mexico. They also operate in personal finance management, financial education and saving, and scoring solutions.<sup>129</sup>

## Financial innovation initiatives

The Mexican government implemented regulation on the use of cryptocurrencies in 2018. It allows banks to undertake certain transactions in cryptocurrencies but not to offer crypto assets to the public.<sup>130</sup>

Mexico is introducing open banking for both fintechs and banks. A first step with regard to the exchange of open personal data and aggregated data was introduced in 2020 and the exchange of transaction data is expected to follow.<sup>131</sup>

Following the regulation of fintechs, a regulatory sandbox was introduced in 2020 with limited success.<sup>132</sup>

## Financial inclusion

Financial literacy in Mexico is low, with only 32% of adults considered to be financially literate.<sup>133</sup> The Mexican government has established a Financial Inclusion National Policy with the goal that 77% of Mexicans will use at least one financial product from an authorized service provider by 2024. Other steps include allowing young people from 15-18 years of age to open accounts without the consent of their parents. Additionally, regulation of banking “correspondents” who can provide financial services on behalf of banks has been updated with regard to authorization and the introduction of risk categories for these services.<sup>134</sup>

## CBDC

In early 2022, the Central Bank of Mexico announced the planned introduction of a CBDC in 2024. This was later postponed to 2025.<sup>135</sup> A recent BIS publication<sup>136</sup> states that the goal is to support the long term vision of payments described above. The key design features of this CBDC should be focused on retail payments. It is envisioned to be flexible, operating on an account-based system that can work in parallel to a token-based system, thus meeting different user needs. It is expected that the liability of the CBDC will remain with the Central Bank and that it should function in an open finance ecosystem that includes both financial and non-financial intermediaries. It should further be resilient and secure, and ensure operational continuity based on proven solutions.<sup>137</sup> This is confirmed by a recent presentation by the Central Bank of Mexico that particularly mentions financial inclusion as a driver.<sup>138</sup>

## End Notes:

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