Market Intelligence
& Analytics

CRISIL
An S&P Global Company

Analysis of Business Correspondents, E-Governance, and other Digital services in India

July 2023

Contents

Abbreviations

AEBA	Aadhaar Enabled Bank Accounts
AEPS	Aadhar enabled payment system
AISHE	All India Survey on Higher Education
AJP	Artificial juridical person
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
ANBC	Adjusted net bank credit
AOP	Association of persons
APB	Aadhar payments bridge
APBS	Aadhar payments bridge system
API	Application programming interface
APY	Atal pension yojana
ASA	Aadhaar service agencies
ASP	Annuity service provider
ATM	Automated teller machine
AUA	Aadhaar user agencies
AUM	Assets under managements
B2B	Business to business
BAAS	Banking as a Service
BBNL	Bharat Broadband Network
BBPOU	Bharat Bill Payment Operating Units
BBPS	Bharat bill payment system
BC	Business correspondents
BCNMs	Business Correspondent Network Managers
BFSI	Banking, financial services and insurance
BHIM	Bharat Interface for Money
BOI	Body of individuals
BSBDA	Basic savings bank deposit accounts
CAD	Current account deficit
CAGR	Compound annual growth rate
CBDC	Central Bank Digital Currency
CBDT	Central Board for Direct Taxes
CBS	Core banking solution
CCA	Control of certifying authorities
CEBR	Centre for Economics and Business Research
CEOBE	Credit equivalent amount of off-balance sheet exposure
CIC	Cash in circulation
CIDR	Central Identity Data repository
COD	Cash on delivery
CPI	Consumer Price Index
CRA	Central Recordkeeping Agency
CSC	Common service centers
CSP	Customer service point
CY	Calendar year
DARPG	Department of Administrative Reforms & Public Grievances
DBT	Direct benefits transfer
DFI	Doubling of farmers income

DMR	Domestic money remittance
DPIIT	Department for Promotion of Industry and Internal Trade
EBITDA	Earnings before interest, taxes, depreciation, and amortization
ECCE	Early Childhood Care and Learning
ECS	Electronic clearance service
EGDI	E-Governance development index
FDI	Foreign direct investments
FI-Index	Financial inclusion index
FTAs	Farm Tele Advisors
FY	Financial year
G2C	Government to citizen
G2E	Government to employees
G2G	Government to government
GDP	Gross domestic product
GER	Gross enrolment ratios
GPR	Government Process Reengineering
GSDP	Gross state domestic product
GST	Goods and Services Tax
GVA	Gross value added
HCE	Host card emulation
HCI	Human Capital Index
HUF	Hindu undivided family
ICT	Information communication technology
IDEA	India Digital Ecosystem of Agriculture
IIP	Index of Industrial production
IMPS	Immediate payment service
IoT	Internet of things
IRDAI	Insurance regulatory and development authority of India
ISP	Internet service provider
ISRO	Indian Space Research Organisation
IVR	Interactive voice response
KKMS	Kisan Knowledge Management System
KSA	KYC service agencies
KUA	KYC user agencies
KYC	Know your customers
LAB	Local area bank
LMS	Learning management systems
LOSI	Local online service index
MFI	Microfinance institution
MMP	Mission mode projects
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MoU	Memorandum of understanding
MPC	Monetary policy committee
MSF	Marginal standing facility
MSME	Micro, small and medium enterprises
MUDRA	Micro Units Development & Refinance Agency Ltd
NABARD	National Bank for Agriculture and Rural Development
NACH	National automated clearing house
NAD	National Academic Depository

NBFC	Non-banking financial company
NBP	New business premium
NCFE-FLIS	National Centre for financial education - Financial Literacy and Inclusion Survey
NDEAR	National Digital Education Architecture
NEBPS	North-East BPO Promotion Scheme
NEFT	National electronic fund transfer
NeGP	National e-Governance Plan
NeGPA	National e-Governance Plan in Agriculture
NEP	National Education Policy
NeSDA	National e-Governance Service Delivery Assessment
NETC	National electronic toll collection issuer platform
NETF	National Educational Technology Forum
NFC	Near field communication
NGO	Non-governmental organization
NIOS	National Institute of Open Schooling
NIPL	NPCI International Payments Limited
NISHTHA	National Initiative for School Heads and Teachers' Holistic Advancement
NMCN	National Medical College Network
NPAs	Non-performing assets
NPCI	National Payments Corporation of India
NPS	National pension system
NROER	National Repository of Open Educational Resources
NSFE	National Strategy for Financial Education
NSSO	National Sample Survey Office
NTN	National Telemedicine Network
NUE	New umbrella entity
O2O	Online to offline
ONDC	Open Network for Digital Commerce
OSI	Online service index
OTA	Online travel agency
OTP	One-tome password
P2P	Peer to peer
PAN	Permanent Account Number
PAT	Profit after taxes
PFCE	Private final consumption expenditure
PFM	Pension fund managers
PFRDA	Pension Fund Regulatory and Development Authority
PIDF	Payment Infrastructure Development Fund
PLI	Production linked incentive
PMAY G	Pradhan Mantri Awas Yojana Gramin
PMAY U	Pradhan Mantri Awas Yojana Urban
PMGDISHA	Pradhan Mantri Gramin Digital Saksharta Abhiyaan
PMI	Purchasing Managers' index
PMJDY	Pradhan Mantri Jan Dhan Yojana
PMJJBY	Pradhan Mantri Jeevan Jyoti Bima Yojana
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
PMMY	Pradhan Mantri Mudra Yojana
PMSBY	Pradhan Mantri Suraksha Bima Yojana
PMSBY	Pradhan Mantri Suraksha Bima Yojana

POS	Point of sale
PPI	Prepaid payments instruments
PPP	Purchasing power parity
PSL	Priority sector lending
PSO	Payment System Operator
RBI	Reserve Bank of India
RERA	Real Estate (Regulation and Development) Act
RoA	Return on assets
RoE	Return on equity
RRB	Regional rural bank
SAHI	Stand-alone health insurers
SCB	Scheduled commercial bank
SDF	Standing deposit facility
SDG	Sustainable development goals
SEBI	Securities and exchange board of India
SFB	Small finance bank
SHG	Self-help group
SRLM	State Rural Livelihood Missions
TII	Telecommunication Infrastructure Index
TPDS	Targeted Public Distribution System
TRAI	Telecom Regulatory Authority of India
UDISE	Unified District Information System for Education
UIDAI	Unique Identification Authority of India
UIN	Unique identification number
UN DESA	The United Nations Department of Economic and Social Affairs
UPI	Unified payments interface
USSD	Unstructured Supplementary Service Data
VLE	Village level entrepreneurs

1 Macroeconomic Scenario

1.1 World economy fighting inflation surge with Indian economy facing volatile commodity prices and tightening of liquidity

The global economy is witnessing tightening monetary conditions in most regions. According to IMF, we are facing a broad based and sharper than expected slowdown with high inflation across the globe. As per the IMF (*World Economic Outlook Update – April 2023*), global growth prospects are estimated to fall from 3.4% in CY2022 to 2.8% in CY2023 and then see an increase in CY2024 to 3.0%, impact of which is expected to be witnessed in Indian economy as well.

Global trade had reached a record level of ~US$32 trillion for CY2022, but its growth had turned negative during the second half of 2022. The trade outlook for CY2023 is expected to be negatively impacted as a result of geopolitical frictions, persisting inflation and lower global demand.

Despite global slowdown, there is a silver lining for the Indian economy. Recent RBI surveys[1] indicate improving customer sentiments which will be a boost to the consumption demand. Further, rise in capacity utilisation rates in the manufacturing sector is favourable for private capex. This is especially true in case of infrastructure linked sectors (such as steel and cement) and Production Linked Incentive scheme linked sectors. The IMF estimates India's GDP to grow by 6.8% in the fiscal 2023 due to its broad range of fiscal, monetary and health responses.

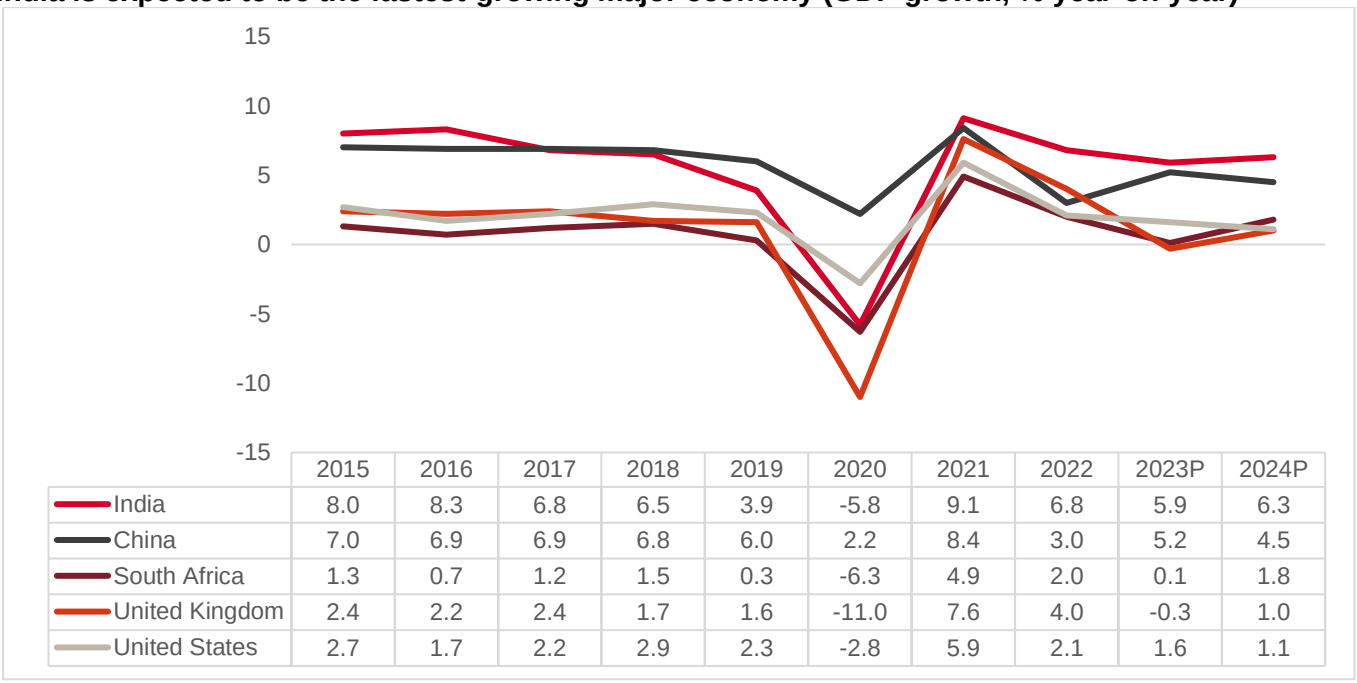
However, domestic demand remains supportive this fiscal, helped by a catch-up in contact-based services, government capital expenditure (capex), relatively accommodative financial conditions, and overall normal monsoon for the fourth time in a row.

The impact is expected to be more in fiscal 2024 as global growth decelerates faster. Additionally, domestic demand could come under pressure as interest rate hikes gets transmitted more to consumers. Consequently, CRISIL MI&A Research expects India's real GDP growth to slow down to 6.0% in fiscal 2024. The risks to the forecast remain tilted downwards.

1.2 India expected to remain one of the fastest growing economies

[1] RBI Consumer Confidence Survey, December 2022

India is expected to be the fastest-growing major economy (GDP growth, % year-on-year)



	2015	2016	2017	2018	2019	2020	2021	2022	2023P	2024P
India	8.0	8.3	6.8	6.5	3.9	-5.8	9.1	6.8	5.9	6.3
China	7.0	6.9	6.9	6.8	6.0	2.2	8.4	3.0	5.2	4.5
South Africa	1.3	0.7	1.2	1.5	0.3	-6.3	4.9	2.0	0.1	1.8
United Kingdom	2.4	2.2	2.4	1.7	1.6	-11.0	7.6	4.0	-0.3	1.0
United States	2.7	1.7	2.2	2.9	2.3	-2.8	5.9	2.1	1.6	1.1

Note: All forecasts refer to IMF forecasts. GDP growth is based on constant prices, ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore, Thailand) is projected to slow to 4.5% in 2023 and then pick up to 4.6% in 2024, Data represented is for calendar years except India which is represented in financial year with FY 2022/23 (starting in April 2022) shown in the 2022 column, P: Projected; Source: IMF (World Economic Outlook Update – April 2023)

Indian economy to be a major part of world trade

Along with being one of the fastest growing economies in the world, India ranked fifth in the world in terms of nominal GDP in calendar year 2022 In terms of purchasing power parity (PPP) as of CY2022, India is the third largest economy in the world, only after China and the United States.

GDP Ranking of key economies across the world (2022)

Country	GDP Rank	% Share (World GDP)	PPP Rank	% Share (World GDP, PPP)
United States	1	24.7%	2	15.5%
China	2	18.0%	1	18.6%
Japan	3	4.2%	4	3.8%
Germany	4	4.0%	5	3.3%
India	5	3.4%	3	7.2%
United Kingdom	6	3.2%	7	2.3%
France	7	2.7%	8	2.3%
Canada	8	2.2%	11	1.4%
Russia	9	2.1%	6	2.9%
Italy	10	2.0%	9	1.9%
Korea	11	1.7%	10	1.7%

Source: IMF, CRISIL MI&A Research

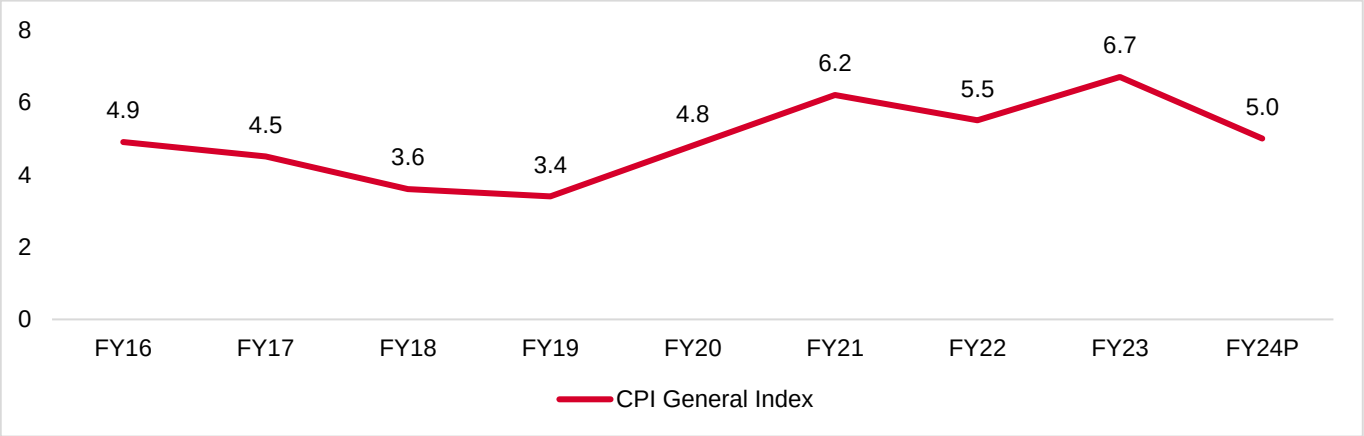
According to IMF, India with its 6.3% GDP growth forecast for fiscal 2024 and $3.4 trillion economy has surpassed UK's $3.2 trillion economy in terms of size making it the fifth biggest economy in the world. With continuous growth in the GDP, India is expected to become the third largest global economy by 2030, as per the Centre for Economics and Business Research (CEBR). This growth in India's GDP is expected to be driven by rapid urbanisation, rising

consumer aspiration and increasing digitalisation coupled with Government support in the form of reforms and policies that are expected to support growth.

1.3 CPI inflation to average at 5.0% in fiscal 2024

India remains vulnerable to external shocks as crude prices ruled over $100 per barrel till June 2022, impacting major macroeconomic variables. The Average inflation based on the Consumer Price Index (CPI), for the fourth quarter of fiscal 2023 moderated to 5.7% from 6.4% in February, lower than that the upper limit of inflation tolerance band of RBI of 6%. CRISIL MI&A Research forecasts a downward bias to the fiscal 2023 CPI inflation. The high base of the previous fiscal has helped to lower the inflation for the month of March 2023, which surged due to oil and food prices from the Russia-Ukraine conflict, and due to strengthening demand after the third wave of Covid-19 subsided. A major relief in March 2023 is contributed due to a sharp correction food inflation. The RBI kept its policy rates unchanged – the repo rate at 6.50% which is expected to be the terminal rate for this cycle. In fiscal 2024, inflation is expected to trend down to 5% on-year, within the RBI's target range of 4-6%. The decline should sustain due to a combination of factors: base effect, lower international commodity prices, and impact of monetary policy actions (rate hikes and liquidity withdrawal) on inflation – should lead to lower inflation.

Annual Inflation (y-o-y%) trend



Source: CSO, Ministry of Industry and Commerce, CRISIL MI&A Research

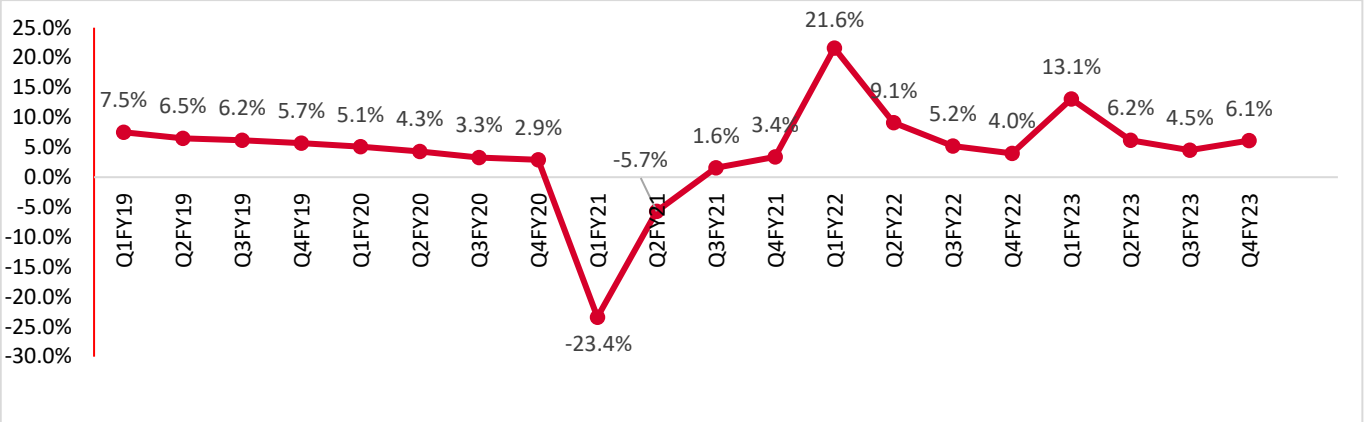
Financial conditions begin to tighten with mounting inflation

The Reserve Bank of India's (RBI's) Monetary Policy Committee (MPC) raised policy rates by 40 bps in May 2022. This was followed by a 50 bps in June 2022, 50 bps in August 2022, 50 bps in September 2022, 35 bps in December 2022 and another hike of 25 bps in February 2023, thus bringing the repo rate to 6.5%, standing deposit facility (SDF) to 6.25% and marginal standing facility (MSF) to 6.75%. The rate hike can be seen as a response to both domestic elevated inflation and spill over risks arising out of aggressive monetary tightening by major central banks. The MPC expects CPI inflation to remain between the 2-6% tolerance range and above the medium-term target of 4%. The average inflation forecast by RBI for fiscal 2024 is expected to be 5.2%.

The GDP numbers showed India's growth slowing to 4.0% on-year in Q4FY22 compared to 5.2% in the previous quarter. Q1FY23 showed broadening recovery to the extent of 13.1%. However, the growth in Q2FY23 moderated to 6.2% post a double-digit expansion in the previous quarter, supported by ongoing recovery in consumption demand

and government capex. Q3FY23 showed a 4.5% growth in GDP. As per provisional estimates, the real GDP in fiscal 2023 grew at 7.2% and Q4FY23 at 6.1%. Further, positive momentum in indicators such as IIP and PMI corroborate the pick-up in contact-based services.

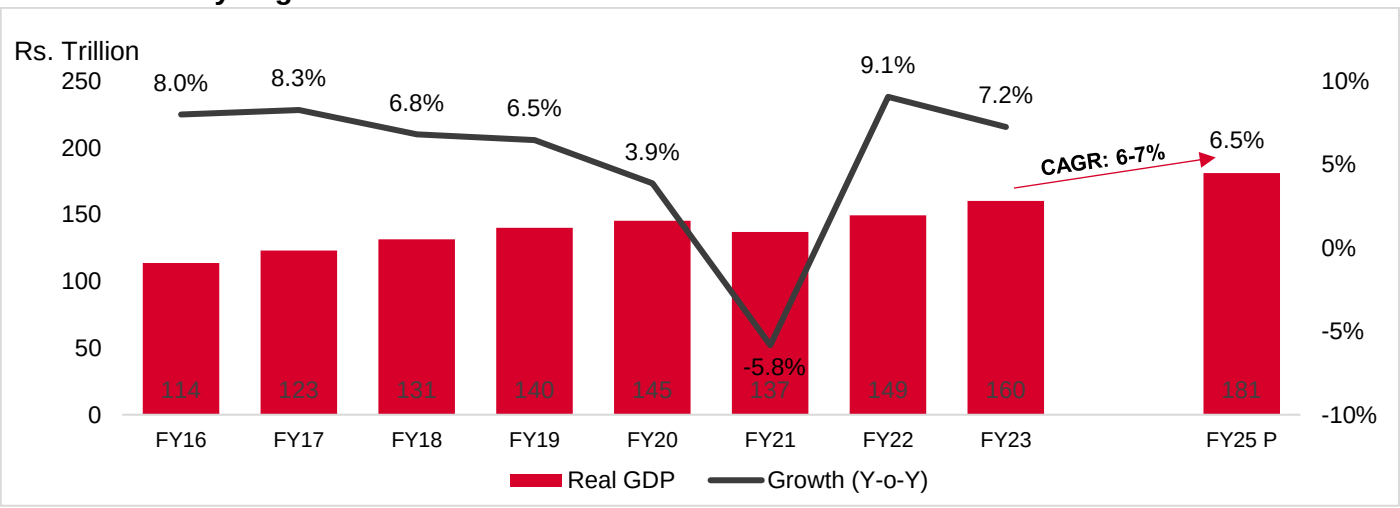
Trend in real GDP growth rate on quarterly basis



Note: Growth Rates Calculated with respect to Previous Year same quarter.
Source: CSO, RBI, CRISIL MI&A Research

India's merchandise exports face headwinds, given the moderation in global growth. At the same time, given India's relatively better growth prospects, imports are expected to remain buoyant. This means pressure on goods trade and, therefore, CAD. However, with international commodity prices softening, and domestic growth momentum which is expected to moderate in sync with the subdued global economic scenario, India's CAD narrowed to 2.2% of GDP in the third quarter of fiscal 2023 from 3.7% in the second quarter, due to a lower merchandise-trade deficit and higher surplus in services trade. Going ahead, a bigger hit to domestic growth in the fiscal 2024 is likely to temper core imports. Along with this, further correction in international crude oil and raw material prices in view of the softening global demand would also narrow the trade deficit. Given these factors, CRISIL MI&A Research expects CAD to decline to 2.0% of GDP in fiscal 2024.

India's economy to grow at ~6.0-7.0% CAGR between fiscal 2023 and fiscal 2025



Note: P – Projected
Source: MOSPI Press note – February 2023, CRISIL MI&A Research

Macroeconomic outlook for Fiscal 2024

Macro variables	FY23	FY24E	Rationale for outlook
GDP (y-o-y)	7.2%	6.0%	Slowing global growth, with tightening global financial conditions likely to weaken India's export in fiscal 2024 and moderate domestic demand. Domestic demand could also come under pressure as Reserve Bank of India (RBI) rate hikes are transmitted to consumers
Consumer price index (CPI) inflation (y-o-y)	6.7%	5.0%	Lower commodity prices, base effect, moderation in food prices and cooling off domestic demand is likely to help in moderating inflation in fiscal 2024.
10-year Government security yield (fiscal-end)	7.4%	7.0%	A moderate increase in gross market borrowings is budgeted for fiscal 2024. This, coupled with expected lower inflation and the RBI's rate cuts, is likely to moderate yields in fiscal 2024
CAD (Current account balance)/GDP (%)	-2.5%	-2.0%	Lower crude prices and cooling of domestic demand followed by a healthy uptick in service exports (IT, business and travel services) and a rise in secondary-income surplus (largely foreign remittances) is expected to lead to moderation of trade deficit in fiscal 2024
Rs/$ (March average)	82.3	83.0	While a lower current account deficit (CAD) will support the rupee, challenging external financing conditions will continue to exert pressure in the next fiscal

Note: E – Estimated; Source: Reserve Bank of India (RBI), National Statistics Office (NSO), CRISIL

1.4 India to remain a growth outperformer globally

Despite the markdown in near-term growth, India is expected to remain a growth outperformer over the medium run. Stronger domestic demand is expected to drive India's growth premium over peers in the medium run. Investment prospects are optimistic given the government's capex push, progress of Production-linked Incentive (PLI) scheme, healthier corporate balance sheets, and a well-capitalised banking sector with low non-performing assets (NPAs). India is also likely to benefit from China-plus-one policy as global supply chains get reconfigured with shifting focus from efficiency towards resilience and friend shoring. Private consumption (~58% of GDP) will play a supportive role in raising GDP growth over the medium run.

Factors that will shape growth in fiscal 2024

The following factors will play a prominent role:

- Some of the highlights of the Union Budget of 2023-24 are as follows –

Announcement	Impact
Strong thrust towards capex seeing a 24% increase to Rs 18.6 trillion to support growth	Highest allocation seen in the infrastructure related sectors such as roads and railways. The allocation of tax-free loan from the Centre to states is also set to increase 30% to 1.3 lakh crore, providing a further boost to the infrastructure sector. As a result of higher investment in the sectors, there is significant scope for job creation which would result in higher income earned thereby paving the way for potential investment in capital markets. On a long-term basis, the thrust towards capex would also

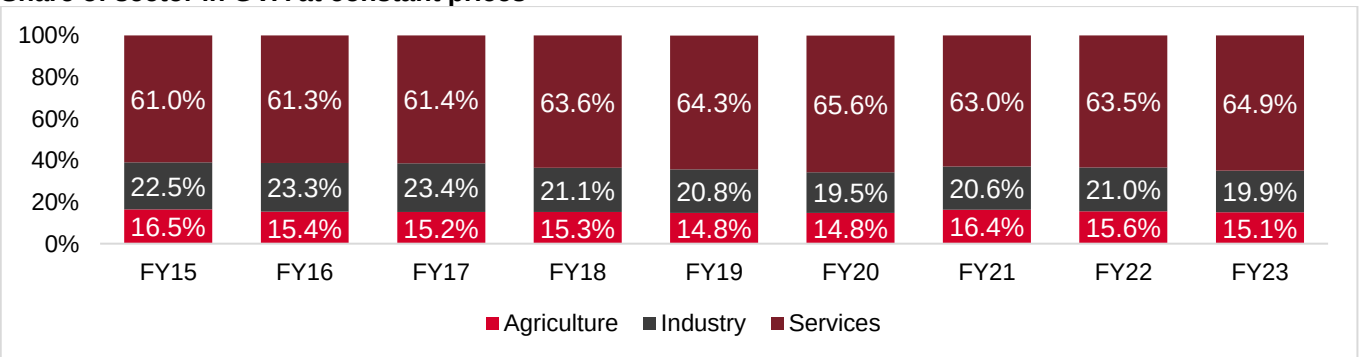
	encourage new businesses to enter the market leading to higher scope for listing of companies on the market.
Tax rebate for income up to Rs 7 lakhs (as per the new regime)	Provides the middle-income households mild relief by increasing their disposable income and cushion the impact of the external slowdown by improving domestic demand and consumer confidence. This increase in disposable income would serve as an opportunity to increase the savings.
Simplification of the know-your-customer process through an expanded DigiLocker service and National Financial Information Registry	Support in technological advancement would promote financial inclusion, ensure better availability of customer data, enable faster and secure sharing of documents with financial institution and increase rural penetration. The aforesaid will led to improving efficiency in terms of operating and credit cost for financial institutions.
Setting up of three centres of excellence for realising the vision of 'Make AI in India and Make AI work for India'	The improvement in digital infrastructure will lead to a significant rise in the creation and consumption of digital data, and the demand for data storage and processing capabilities. This, coupled with the government's initiative of data embassies, is expected to attract private investments in the data centre ecosystem. For fiscal 2024, data centre investments are estimated to be $4.8-5.0 billion.

- Global slowdown to impact domestic industrial activity via the exports channel
- The one-time lift to contact-based services from domestic demand will abate next fiscal, but government capex will stay supportive
- Tightening domestic financial conditions will hurt growth next fiscal

1.5 Contribution of various sectors to India's GDP

As compared to various developed economies, which witnessed a good contribution from manufacturing and industry first and subsequently in services, the Indian transformation story has been different. A notable feature of Indian economy has been the services sector's rising contribution to the overall output of the economy. In fiscal 2023, overall GVA at constant prices expanded by approximately 7.0%.

Share of sector in GVA at constant prices



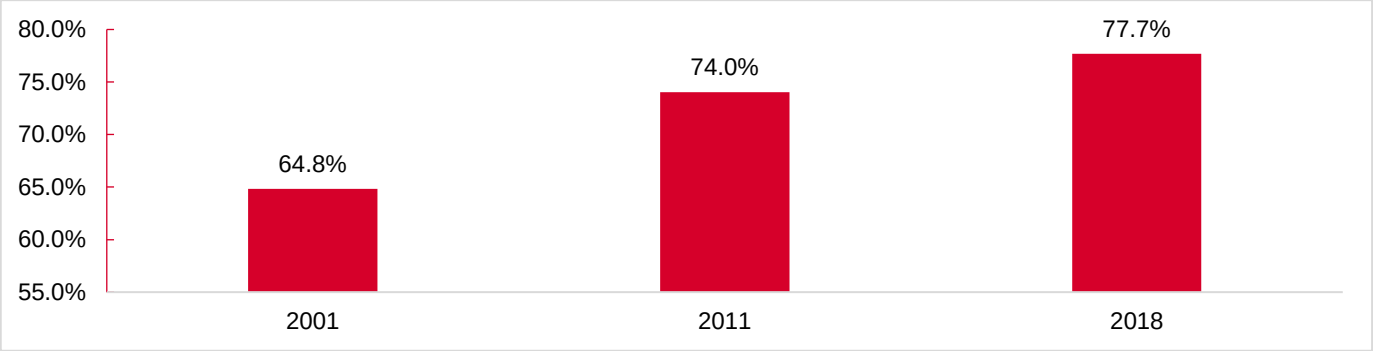
Source: MOSPI, RBI; CRISIL MI&A Research

1.6 Key structural reforms: Long-term positives for the Indian economy

Financial literacy

Overall literacy in India is at 77.7% as per the results of recent NSSO survey conducted from July 2017 to June 2018 which is still below the world literacy rate of 86.5%. However, according to the National Financial Literacy and Inclusion Survey (NCFE-FLIS) 2019, only 27% of Indian population is financially literate indicating huge gap and potential for financial services industry. The survey defines financial literacy as combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing. According to the World Bank's Global Findex Database 2021, the global average of adult population with an account opened with a bank, financial institution or mobile money provider, was approximately 69% in calendar year 2017. India's financial inclusion has improved significantly over calendar years 2014 to 2017 as adult population with bank accounts increased from 53% to 78% (Source: Global Findex Database) due to the Indian government's concentrated efforts to promote financial inclusion and the proliferation of supporting institutions.

Overall literacy rate on the rise in India



Source: Census 2011, NSO Survey on household social consumption (2017-18), CRISIL MI&A Research

With increasing financial literacy, mobile penetration, awareness and the Prime Minister's Jan Dhan Yojana bank accounts (scheme aimed at bringing the unbanked under the formal banking system), there has been a rise in the participation of individuals from non-metro cities in banking. With more people attached to the formal banking sector, the demand for financial products in smaller cities has seen a major increase in recent years. Going forward, CRISIL MI&A Research expects financial penetration to increase on account of increasing financial literacy.

GST implementation

Introduced on July 1, 2017, the GST is an indirect tax regime that subsumed multiple cascading taxes levied by the central and state governments. Its implementation has spawned structural changes in the supply chain and logistics network in the country. The crux of the GST mechanism is input tax credit, which ensures more players in the supply chain come under the tax ambit. As supply from only registered taxpayers will get input tax credit, businesses and stakeholders will insist on registration of their suppliers and traders, leading to an increase in the share of organised participants. The GST regime has been stabilising fast and is expected to bring more transparency and increase in formalisation, eventually leading to higher economic growth.

PLI scheme to boost manufacturing in the long run

The government has budgeted ~Rs 2 trillion to give incentives to the local manufacturing units in 13 key sectors. The key sectors likely to get benefit from the scheme include automobiles, pharma, telecom, electronics, food, textile,

steel and energy. By incentivising production subject to achieving the desired scale, the scheme aims to spawn a handful of globally competitive large scale manufacturing units in the identified sectors. Furthermore, the government also hopes to reduce India's dependence on raw material imports from China. The scheme is expected to provide a boost to economic growth over the medium-term and create more employment opportunities as many of these sectors are labour intensive in nature.

Broad Sector	Segment	Budgeted (Rs. Bn)*	
Automobiles	Advance Chemistry Cell (ACC) Battery	181	751
	Automobiles & auto components	570	
Electronics	Mobile manufacturing and specified electronic Components	409	521
	Electronic/technology products	50	
	White goods (ACs & LED)	62	
Pharma and medical equipment	Critical key starting materials/drug intermediaries and active pharmaceutical ingredients	69	253
	Manufacturing of medical devices.	34	
	Pharmaceuticals drugs	150	
Telecom	Telecom & networking products	122	122
Food	Food products	109	109
Textile	Textile products: MMF segment and technical textiles	107	107
Steel	Speciality steel	63	63
Energy	High efficiency solar PV modules	45	45
Total			**1,972**

**Approved financial outlay over a five-year period, Source: Government websites; CRISIL MI&A Research*

The rate of incentives offered under PLI are measured as a percentage of incremental sales over 5–7-year period varies between 4-6% for mobile phones and white goods, 5-20% for pharma active ingredients and 8-18% for auto and auto components. CRISIL MI&A Research expects the PLI scheme to lead a potential overall capex of Rs. 2.5-3 trillion over the scheme period.

Thrust on affordable housing

The residential real estate segment saw two policy changes – Real Estate (Regulation and Development) Act (RERA) and Goods and Services Tax (GST) -- which had a direct impact on the sector's demand-supply dynamics. Consequently, new launches dropped sharply, with developers focussing on completing ongoing projects. The sector had been battling weak demand for the past couple of years, and one of the key reasons was unaffordability, as developers focussed on the middle and premium income-category projects. However, government initiatives have prompted developers to explore affordable housing as a new area. Going ahead, about half of the incremental supply being added in urban stock is expected to be via affordable housing. Additionally, the formalisation of the industry is likely to bring in more transparency, leading to an increase in consumer demand.

In a major relief to real estate sector, the government has extended the timelines of RERA projects by six months for projects expiring on or after March 25, 2020. Further, in affordable housing for rural areas, it has extended the deadline to March 2024, and for urban areas to December 2024 for first time homebuyers to avail additional Rs 150,000 interest deduction on home loans. PMAY U and G have been focused to provide affordable housing for

lower income group and Economic weaker section households which is nothing but affordable housing in country. The government remains focused on the PMAY U and G, and as of May 2023, construction of close to 30 million homes across urban and rural regions have been completed.

PMAY Gramin (Rural)

Under the PMAY-Gramin (PMAY-G), as many as 22.8 million houses were completed as of 2nd June 2023. The government has set up a target of constructing 29.4 million houses by fiscal 2024 under the scheme.

PMAY G status (as of June 2, 2023)

	Target (MoRD) (in millions)	Sanctioned (in millions)	Completed (in millions)
PMAY G	29.35	28.52	22.82

Note: MoRD: Ministry of Rural Development, Source: PMAY-G, CRISIL MI&A Research

PMAY Urban

On 17th August 2022, the Union Cabinet approved the proposal of Ministry of Housing and Urban Affairs (MoHUA) for continuation of Pradhan Mantri Awas Yojana- Urban (PMAY-U) up to 31st December 2024.

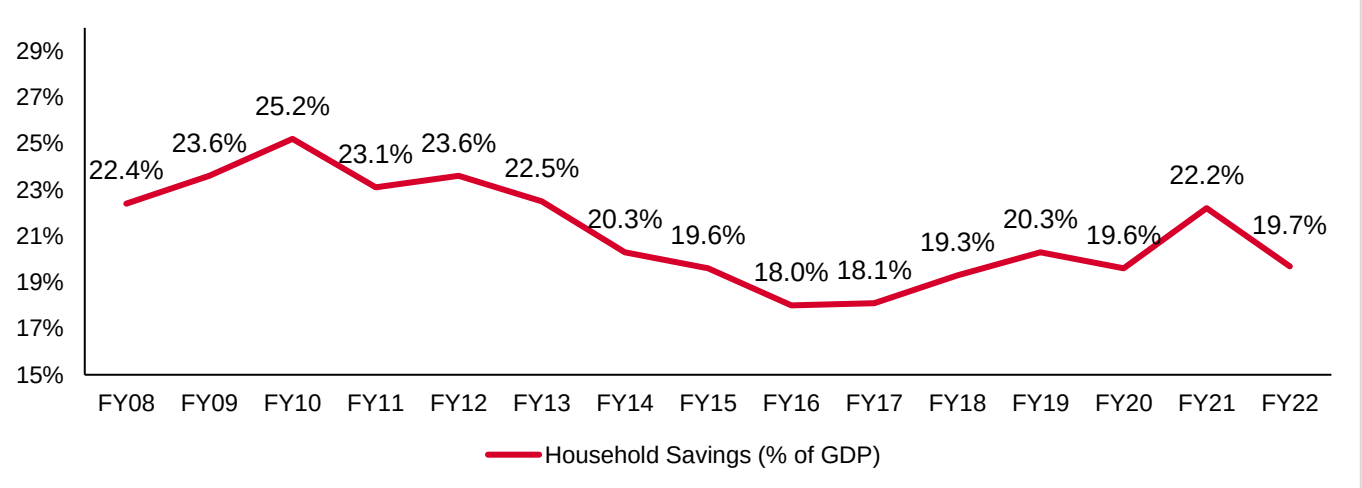
PMAY U status (as of May 29, 2023)

	Target	Sanctioned (in millions)	Houses Grounded (in millions)	Completed (in million)
PMAY U	Housing for All	11.97	11.07	7.45

Source: MOHUA, CRISIL MI&A Research

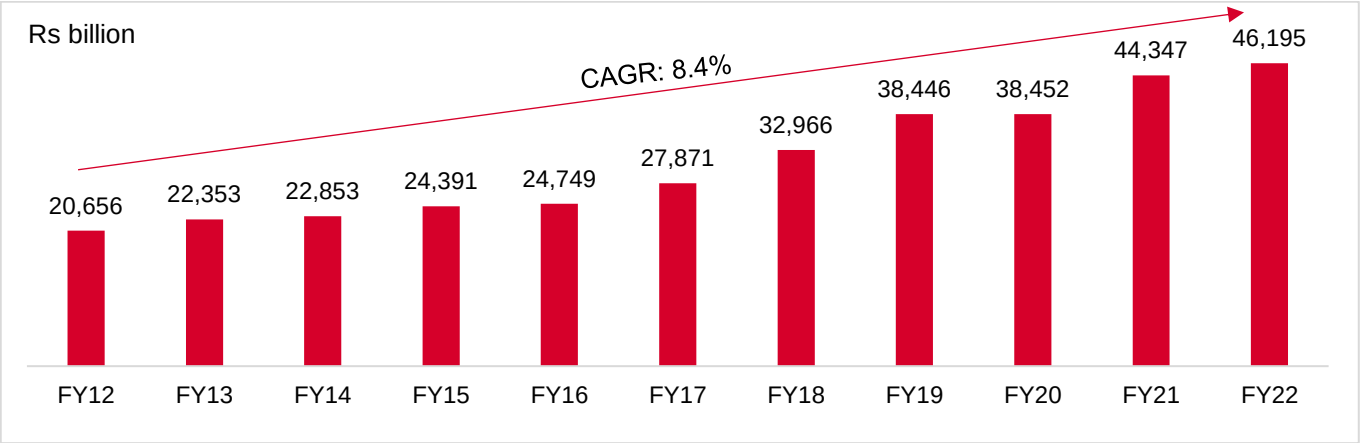
Household savings to increase

Household savings as a percentage of GDP decreased to fiscal 2020 level in fiscal 2022



Note: E: Estimated, Source: Ministry of Statistics and Programme Implementation (MOSPI), RBI, CRISIL MI&A Research

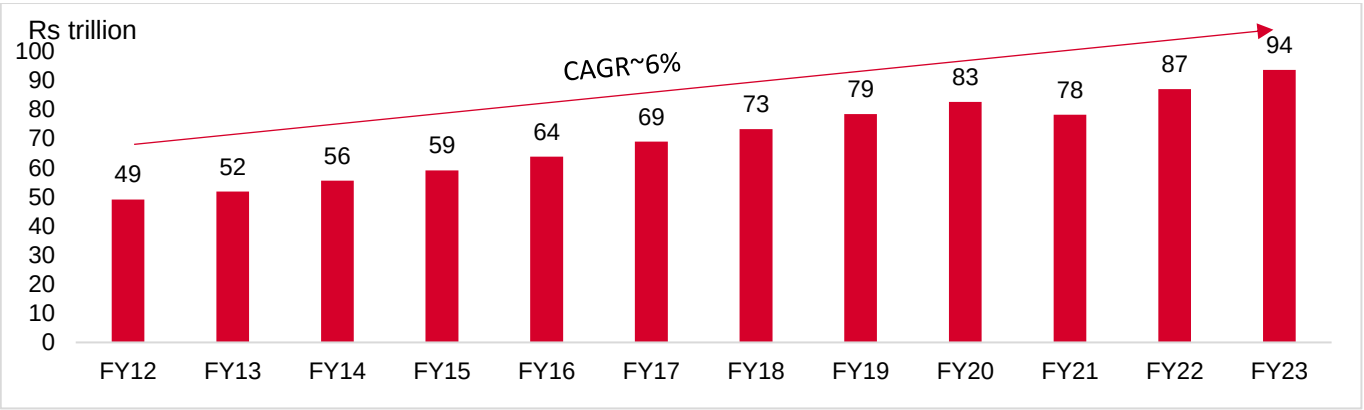
Household savings growth



Source: MOSPI, CRISIL MI&A Research

CRISIL MI&A Research expects India to continue being a high savings economy.

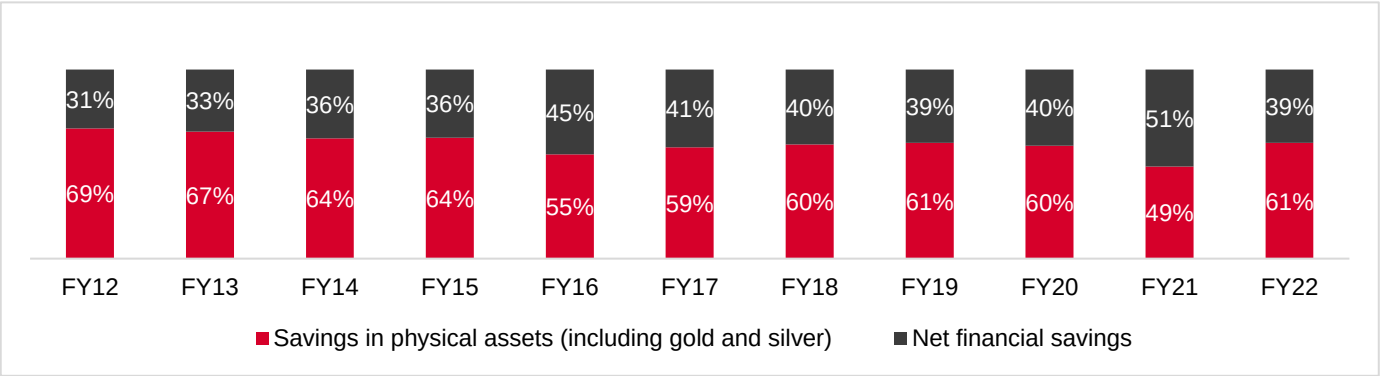
Private final consumption expenditure (PFCE) has grown ~6% over fiscal 2012-23



Note: Private final consumption expenditure is at constant prices (at 2011-2012 prices)
Source: MOSPI, CRISIL MI&A Research

Although households' savings in physical assets has declined to 61% in fiscal 2022 from 69% in fiscal 2012, it constitutes a substantial share in overall savings. On the other hand, the share of net financial savings has witnessed an uptrend to 39% in fiscal 2022 from 31% in fiscal 2012. In the long-term, with increase in financial literacy, CRISIL MI&A Research expects the share of financial assets as a proportion of net household savings to increase over the next five years, thereby boosting investments in assets such as insurance and mutual funds.

Savings in physical assets (including gold and silver) increased substantially in fiscal 2022



Source: MOSPI, CRISIL MI&A Research

Rural economy is becoming structurally far more resilient

According to Census 2011, there are about 640,000 villages in India, which are inhabited by about 893 million people, comprising about 65% of the country's population as of CY2021.

The rural economy is far more resilient today due to increased spends under MNREGA and irrigation programmes, direct benefit transfer (DBT), the PM-Kisan scheme, PM Ujwala Yojana for cooking gas, PM Awas Yojana for housing, and Ayushman Bharat scheme for healthcare. To supplement this, there has been a continuous improvement in rural infrastructure such as electricity and roads. These government initiatives have led to lesser leakages and higher incomes in the hands of the rural populace, thereby enhancing their ability and willingness to spend on discretionary products and services. The structural changes, combined with a positive macro environment, will improve rural business prospects, provide business opportunities for the banking and financial services sector and drive the long-term growth of the economy.

Account Aggregators framework to build a financial data ecosystem in India

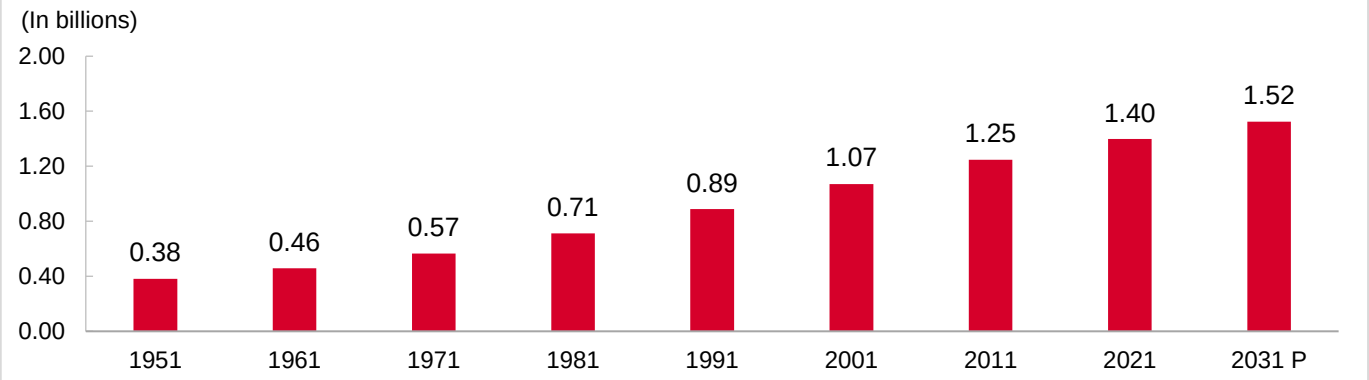
The RBI launched the account aggregator system on September 2, 2021, which has the potential to transform the MSME finance space once there is widespread adoption amongst the lending community. These account aggregators would provide granular insights to lenders into customers' financial assets and their borrowing history centrally, based on customer consent. Inclusion of additional data such as electricity bill payments and mobile recharges/bill payment data under the purview of account aggregators would further enhance its utility.

1.7 Key growth drivers

India has world's largest population

As per Census 2011, India's population was ~1.25 billion, and comprised nearly 245 million households. As of CY2022, the population is more than 1.42 billion and has surpassed China as of January 2023 as the most populous country in the world.

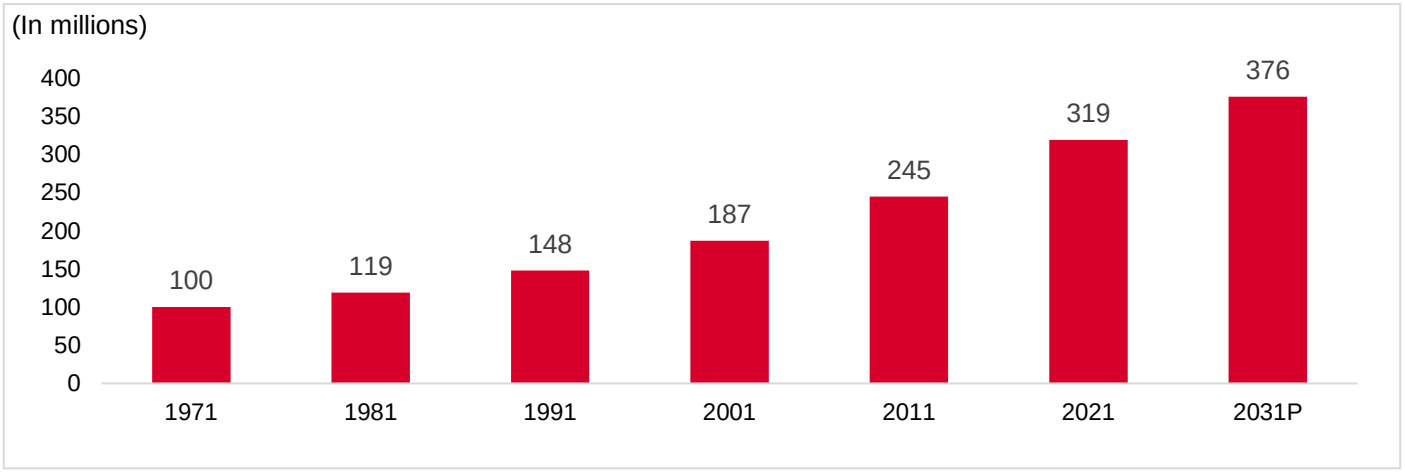
India's population growth trajectory



Note: P: Projected

Source: United Nations Department of Economic and Social affairs, CRISIL MI&A Research

Number of households in India

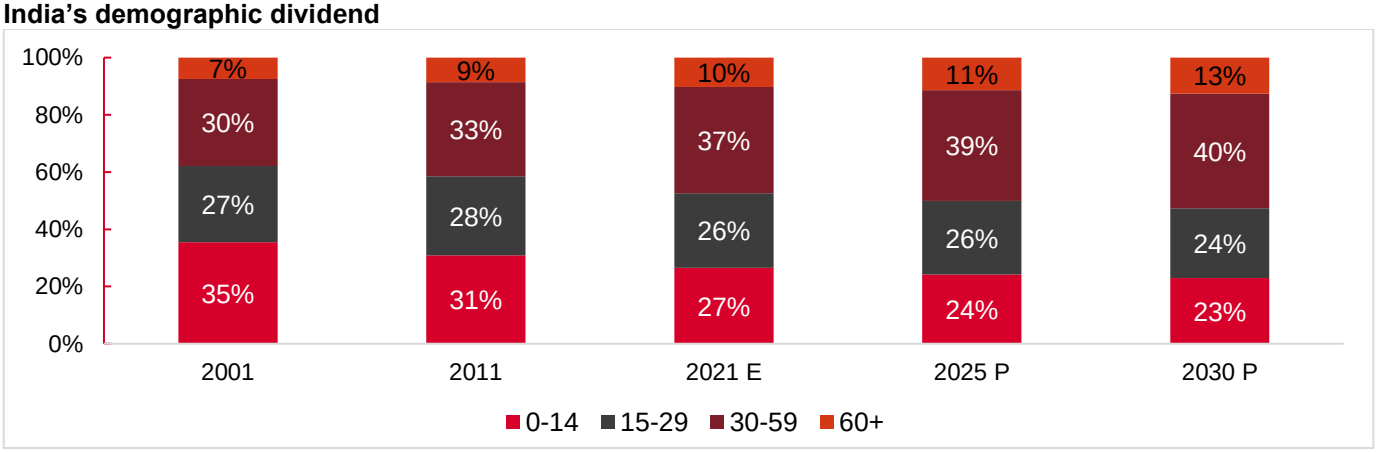


Note: P: Projected
Source: Census India, CRISIL MI&A Research

Favourable demographics

As of calendar year 2020, India has one of the largest young populations in the world, with a median age of 28 years. CRISIL MI&A Research estimates that approximately 90% of Indians are still below the age of 60 in calendar year 2021 and that 63% of them are between 15 and 59 years. In comparison, in calendar year 2020, the United States (US), China and Brazil had 77%, 83% and 86%, respectively, of their population below the age of 60.

India's demographic dividend



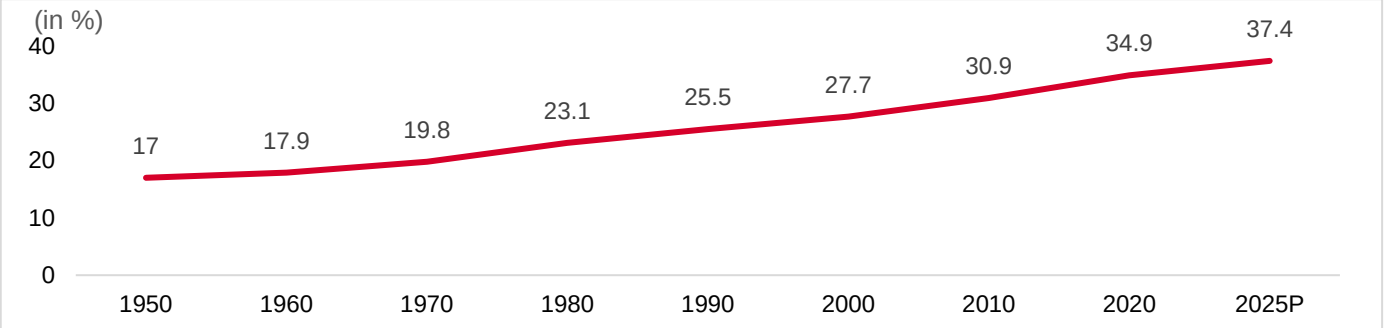
Note: E: Estimated, P: Projected
Source: United Nations Department of Economic and Social affairs, CRISIL MI&A Research

Urbanisation

India's urban population has been rising over years and stood at ~31% of total population in 2010; the uptrend is expected to continue. The UN report has projected that nearly 40% of the country's population will live in urban areas by 2030. People from rural areas move to cities for better job opportunities, education, and quality of life. The entire family or only a few individuals (generally an earning member or students) may migrate, while the other members continue living in rural house. Numerous schemes and projects launched by the government, such as the Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana (Urban), among other initiatives, has aided the growth in urbanisation. Urbanisation is one of India's most important economic growth drivers. It is expected to drive substantial investments in infrastructure development, which in turn is expected to create jobs, develop modern consumer services and increase the ability to mobilise savings. India's

urban population has been rising consistently over the decades. In 1950, it was 17% of total population. As per the 2018 revision of World Urbanization prospects, it was estimated at 34.9% for India in 2020. This is expected to reach 37.4% by 2025.

Urban population as a percentage of total population (%)



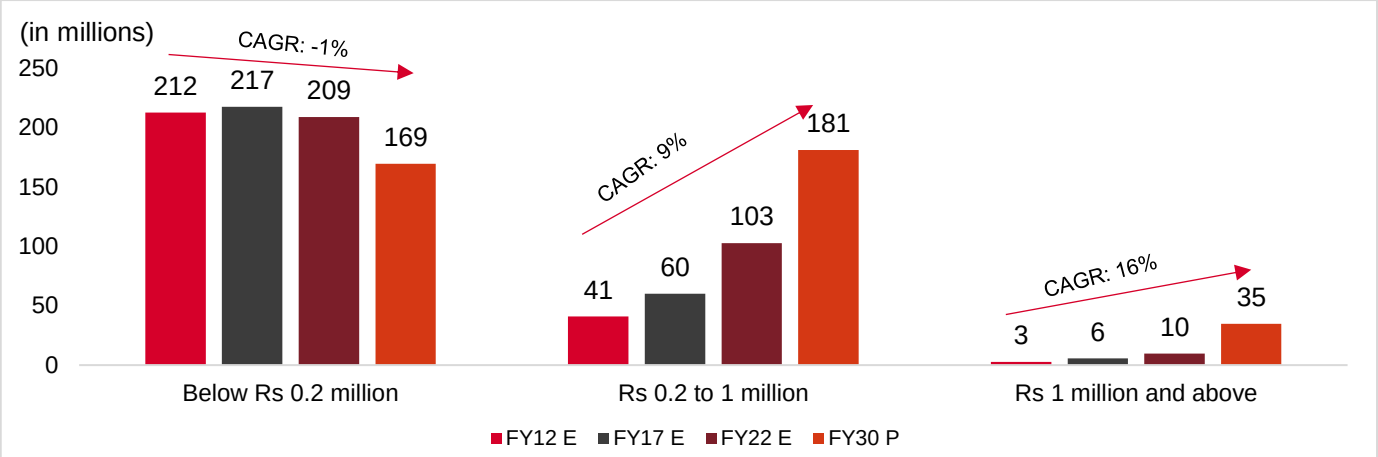
Note: P – Projected
Source: Census 2011, World Urbanization Prospects: The 2018 Revision (UN)

Rising Middle India population to help sustain growth

Proportion of Middle India (defined as households with annual income of between Rs. 0.2 to 1 million) has been on a rise over the last decade and is expected to grow further with continuous increase in the GDP and household incomes. To illustrate, CRISIL MI&A Research estimates that there were 41 million households in India in this category as of Fiscal 2012, and by Fiscal 2030, they are projected to increase to 181 million households translating into a CAGR of 9% over this time period. This growth in the number of middle-income households is expected to lead to enhanced opportunities for retail and MSME financiers as well as consumer goods marketers. A large number of these households, which have entered the Middle-Income bracket in the last few years, are likely to be from semi-urban and rural areas. The rise in incomes in these areas is also evident when one observes the trend in share of deposits coming into banks.

Consistent improvement in the literacy levels, increasing access to information and awareness, increase in the availability of basic necessities such as electricity, cooking gas, toilets and improvement in road infrastructure has led to an increase in aspirations of Middle India, which is likely to translate into increased opportunities for financial service providers. In fact, some of these trends are already visible. Smart phone ownership, internet users and the proportion of users accessing social media is increasing at a breakneck speed. Smaller cities and towns (with population less than 1 million) account for a significant portion of sales of e-retailers.

Middle India households witnessed high growth over fiscal 2012 to fiscal 2022



Note: E: Estimated, P: Projected
Source: CRISIL MI&A Research

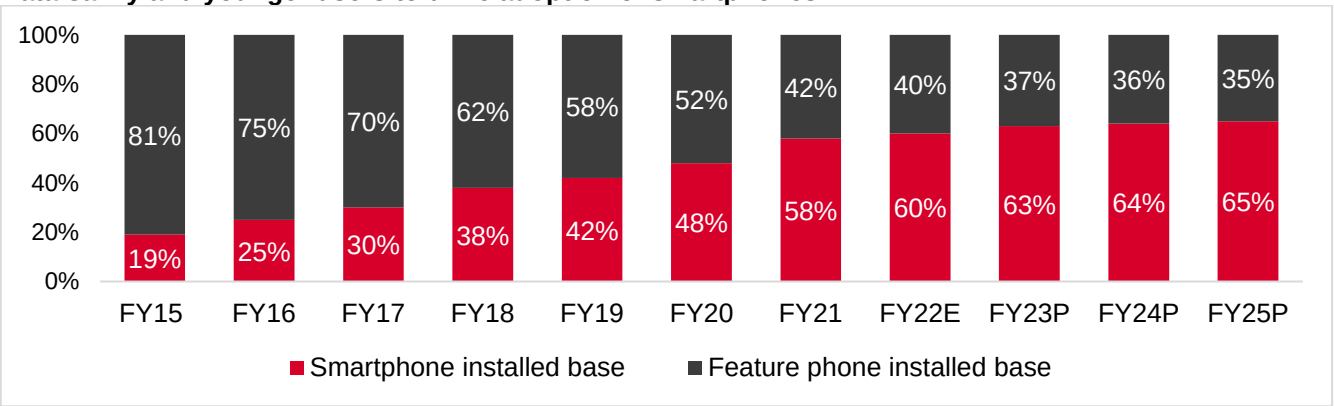
1.8 Digitisation: Catalyst for the next growth cycle

Technology is expected to play a pivotal role in taking the financial sector to the next level of growth, by helping to surmount challenges stemming from India's vast geography, which makes physical footprints in smaller locations commercially unviable. Technology is conducive for India, considering its demographic structure where the median age is less than 30 years. The young population is tech savvy and at ease with using it to conduct the entire gamut of financial transactions. With increasing smartphone penetration and faster data speeds, consumers are now encouraging digitisation as they find it more convenient. Digitisation will help improve efficiency and optimise cost. Players with better mobile and digital platforms will draw more customers and emerge as winners in the long term.

In August 2020, RBI has announced a new licence for NUE (new umbrella entity) for retail payments. These NUEs will innovate and compete with NPCI in setting up and managing new payment systems in the retail space.

Mobile penetration: Higher mobile penetration, improved connectivity, and faster and cheaper data speed, supported by Aadhaar and bank account penetration have led India to shift from being a cash-dominated economy to a digital one.

Data-savvy and younger users to drive adoption of smartphones



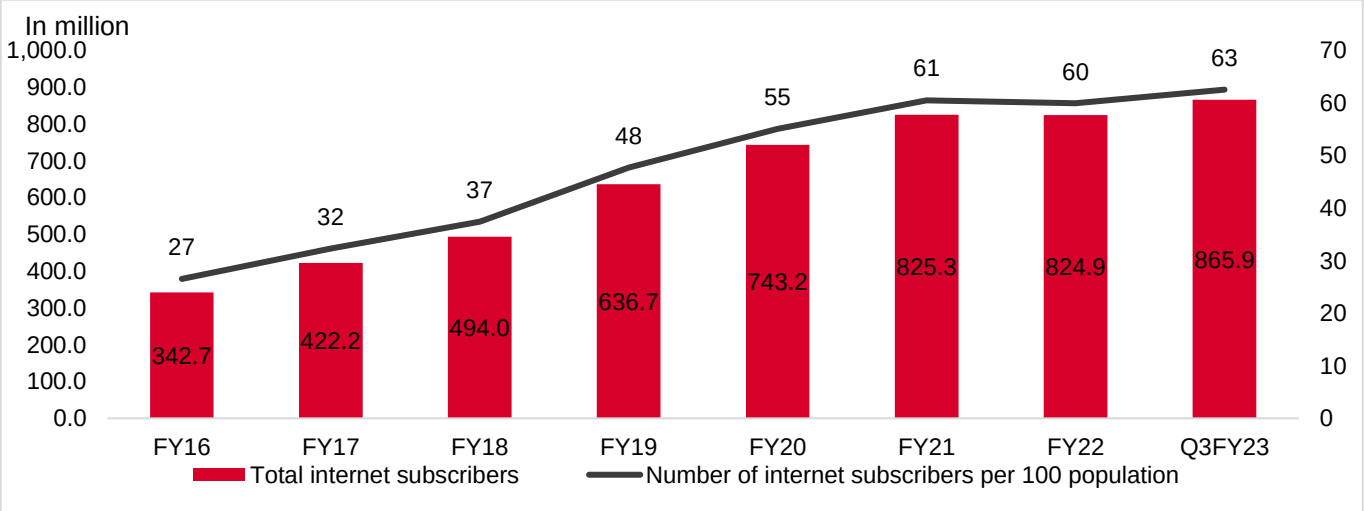
Note: E: Estimated, P: Projected
Source: CRISIL MI&A Research

Rise in 4G penetration and smartphone usage

India had 1,144 million wireless subscribers as of March 2023, and the number is growing at a steady pace every year. The reach of mobile network, internet and electricity is continuously expanding the subscriber footprint to remote areas leading to rising smartphone and internet penetration in the country. Internet subscribers have risen sharply in India from 422 million subscribers in fiscal 2017 to 866 million subscribers as of December 2022. In terms of number of internet subscribers per 100 population, number has almost doubled from 33 in fiscal 2017 to 63 in December 2022.

Average wireless data usage per month per subscriber has seen an increasing trend over the last eight years. Per subscriber per month data usage was 0.1 GB in FY15 which has increased to 17 GB in December 2022. This is due to increasing internet data penetration in the country.

Trend in internet subscribers in India



Source: TRAI, CRISIL MI&A Research

Across India, Uttar Pradesh and Maharashtra are the largest two access areas in terms of subscriber base. The lower adoption in some states like Punjab, Haryana, Himachal Pradesh, Odisha, etc. indicates that going ahead, larger proportion of the population can be served using digital services.

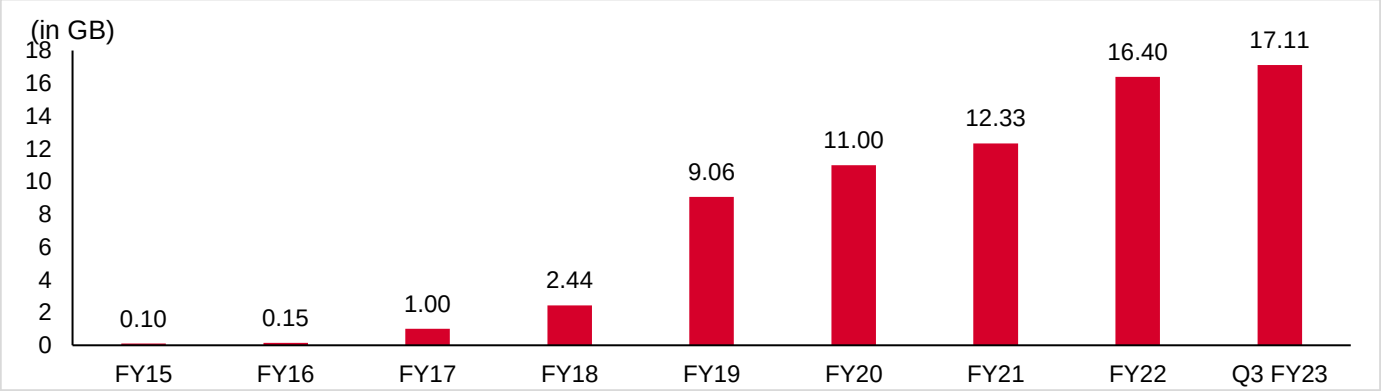
All-India access subscriber base (Wireless + Wireline)

Service Area	Mar-23 (million)
Andhra Pradesh	84.91
Assam	25.28
Bihar	91.92
Delhi	58.54
Gujarat	67.44
Haryana	27.10
Himachal Pradesh	8.94
Jammu and Kashmir	12.37
Karnataka	69.02
Kerala	43.79
Madhya Pradesh	77.99
Maharashtra	92.96

Mumbai	37.59
North East	12.56
Odisha	33.55
Punjab	36.88
Rajasthan	64.43
Tamil Nadu	81.25
Uttar Pradesh E	100.19
Uttar Pradesh W	63.49
Kolkata	24.95
West Bengal	57.18

Source: TRAI, CRISIL MI&A Research

Trend of average wireless data usage per wireless data subscriber per month



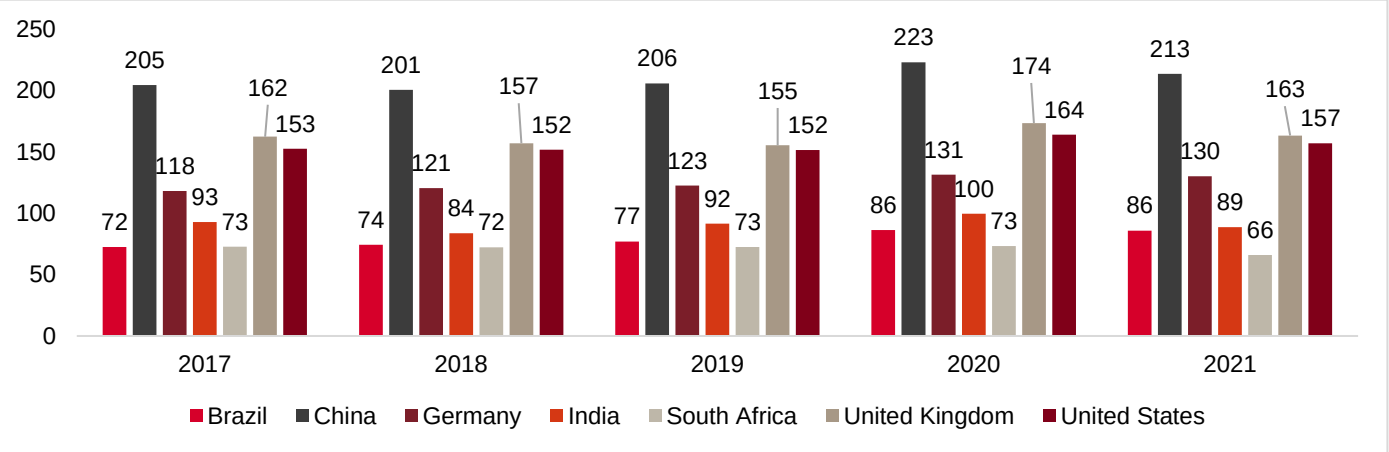
Source: TRAI, CRISIL MI&A Research

2 Financial inclusion

2.1 Current scenario and key developments

In the times of crisis like pandemic, financial inclusion becomes more imperative than ever for vulnerable households and businesses to navigate the crises and recover after the pandemic. In terms of the credit to private non-financial sector to GDP ratio, India has a low credit penetration compared with other developing countries, such as China indicating that the existing gap needs to be bridged.

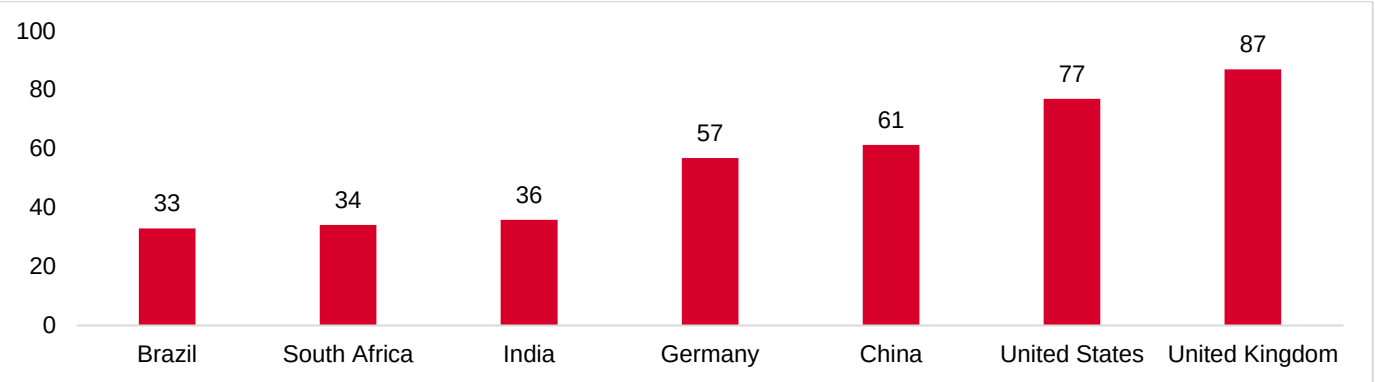
Credit to the private non-financial sector to GDP ratio (%) CY2021



Source: Bank of International Settlements, CRISIL MI&A Research

Similarly, in terms of credit to households as a proportion of GDP as well, India lags other markets, with household credit hovering at around 36% of GDP as of CY 2021.

Household Credit to GDP ratio (CY2021)

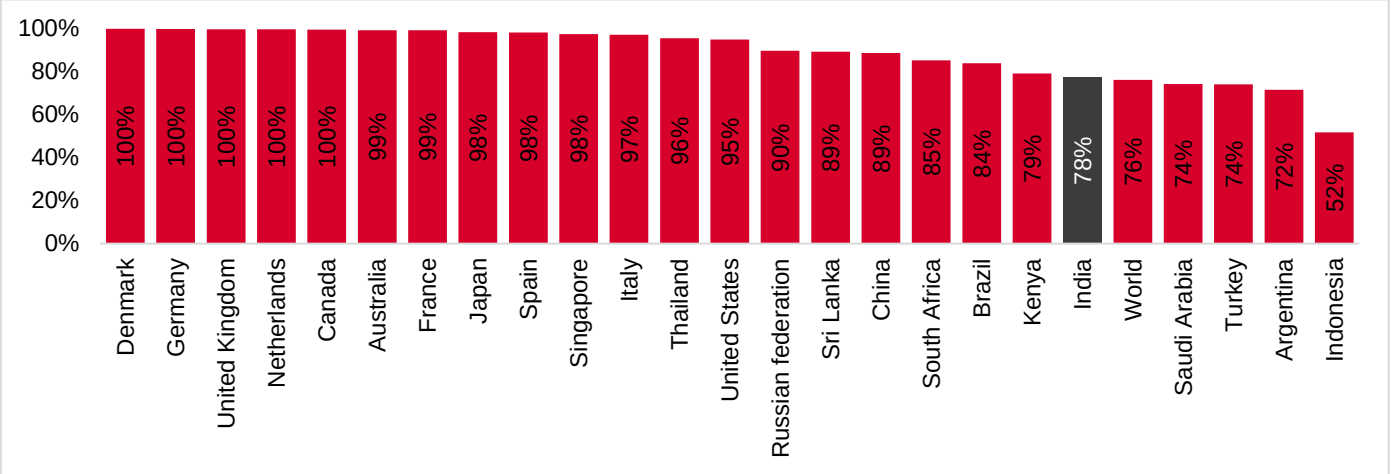


Source: Bank of International Settlements, CRISIL MI&A Research

Financial Inclusion on a fast path in India

According to the World Bank's Global Findex Database 2021, the global average of adult population with an account opened with a bank, financial institution, or mobile money provider, was approximately 76% in calendar year 2021. India's financial inclusion has improved significantly over calendar years 2014 to 2021 as adult population with bank accounts increased from 53% to 78% (Source: Global Findex Database) due to the Indian government's concentrated efforts to promote financial inclusion and the proliferation of supporting institutions.

Adult population with a bank account (%): India vis-à-vis other countries



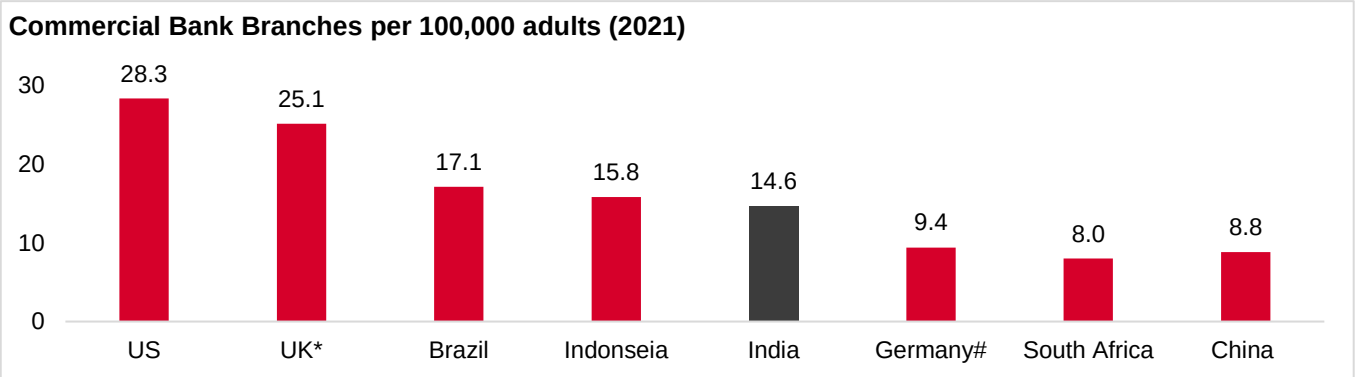
Note: 1. Global Findex data for India excludes northeast states, remote islands and selected districts. 2. Account penetration is for the population within the age group of 15+

Source: World Bank - The Global Findex Database 2021, CRISIL MI&A Research

The low levels of adults with bank accounts in comparison with various countries can be further explained by the large number of rural households in the country, which account for nearly two-thirds of the total households in the country. The shift in households towards urban regions is taking place albeit at a very slow pace.

India is one of the countries with lower commercial bank branches and ATM penetration indicating huge room for financial inclusion and banking services penetration. As of calendar year 2021, India has 14.6 branches and 21 ATMs for one lakh adults according to World Bank data which is relatively lower than other developing and developed countries.

Commercial bank branch penetration across the world (CY2021)



Note: (*) – UK data is as of 2013 calendar year, (#) – Germany data is as of 2020 calendar year

Source: World Bank, CRISIL MI&A Research

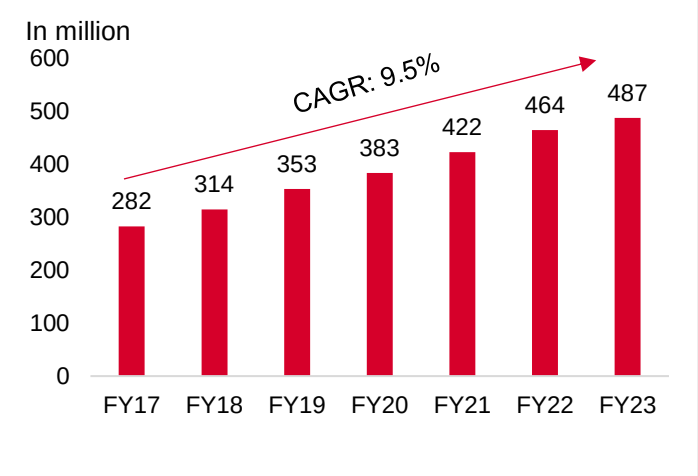
The low levels of adults with bank accounts in comparison with various countries can be further explained by the large number of rural households in the country, which account for nearly two-thirds of the total households in the country. The shift in households towards urban regions is taking place albeit at a very slow pace.

The two key initiatives launched by the Government to promote financial inclusion are the Pradhan Mantri Jan Dhan Yojana (“**PMJDY”**) and Pradhan Mantri Jeevan Jyoti Bima Yojana (**“PMJJBY”**). Under the PMJDY, the Government’s aim is to ensure that every household in India has a bank account which they can access from anywhere and avail of all financial services such as savings and deposit accounts, remittances, credit and insurance affordably. PMJJBY is a one-year life insurance scheme that offers a life cover of Rs. 0.2 million at a premium of Rs.

330 per annum per member, which can be renewed every year. The Government has also launched the Pradhan Mantri Suraksha Bima Yojana (PMSBY), an accident insurance policy that offers an accidental death and full disability cover of Rs. 0.2 million at a premium of Rs. 12 annually. As per the Government, more than 100 million people have registered for these two social security schemes.

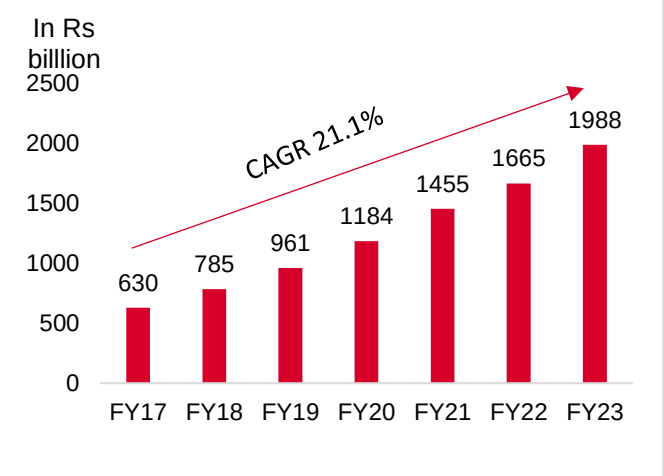
PMJDY launched in August 2014, aims to extend banking facilities to all within a reasonable distance in each sub-service area (consisting of 1,000-1,500 households) across India. As on March 29, 2023, nearly 487 million PMJDY accounts had been opened, of which, 67% were in rural and semi-urban areas, with total deposits of Rs. 1,988 billion.

Number of PMJDY accounts



Note: FY23 data is as of March 29, 2023
Source: PMJDY; CRISIL MI&A Research

Total balance in PMJDY accounts

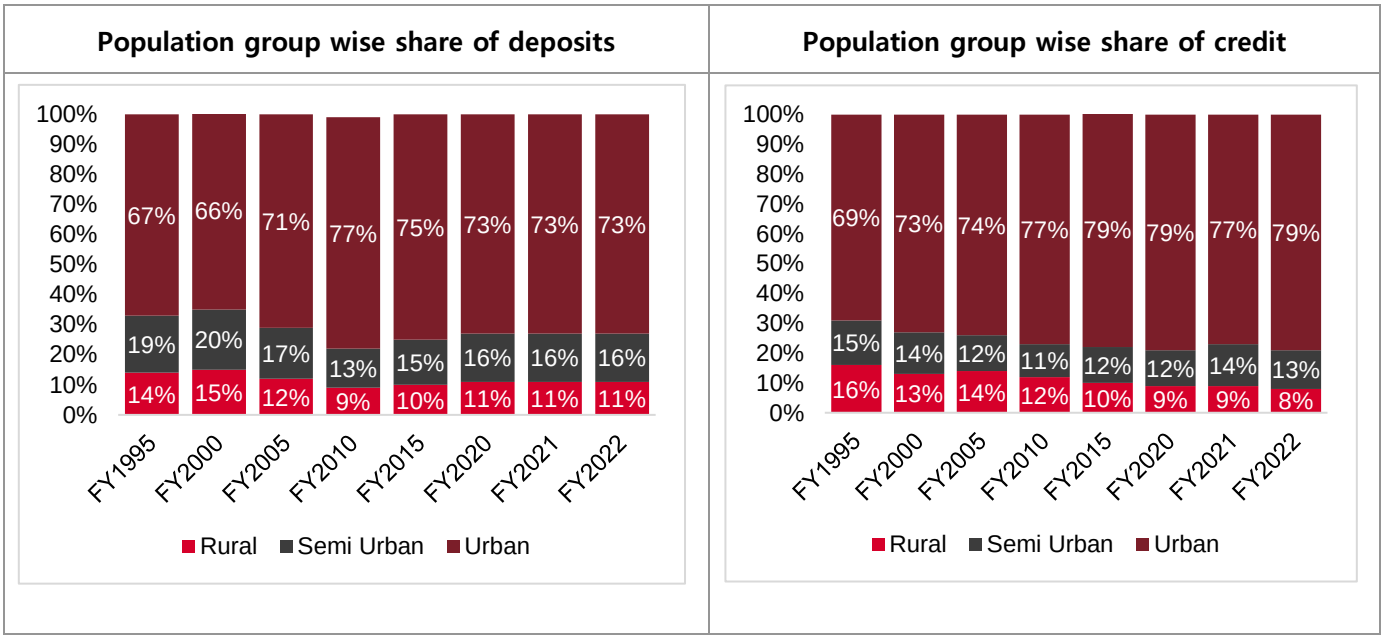


Note: FY23 data is as of March 29, 2023
Source: PMJDY; CRISIL MI&A Research

Rural India accounts only about 8% of total credit and 11% of total deposits

The share of total credit outstanding is about 8% in rural areas and 92% in urban areas as of March 31, 2022. The massive divergence in the rural areas' share of India's GDP and banking credit services compared with urban areas is an indicator of the extremely low penetration of banks in rural areas. The chart below shows the share of deposits and credit outstanding in rural and urban areas:

Low share of banking credit and deposit indicates lower penetration in rural areas



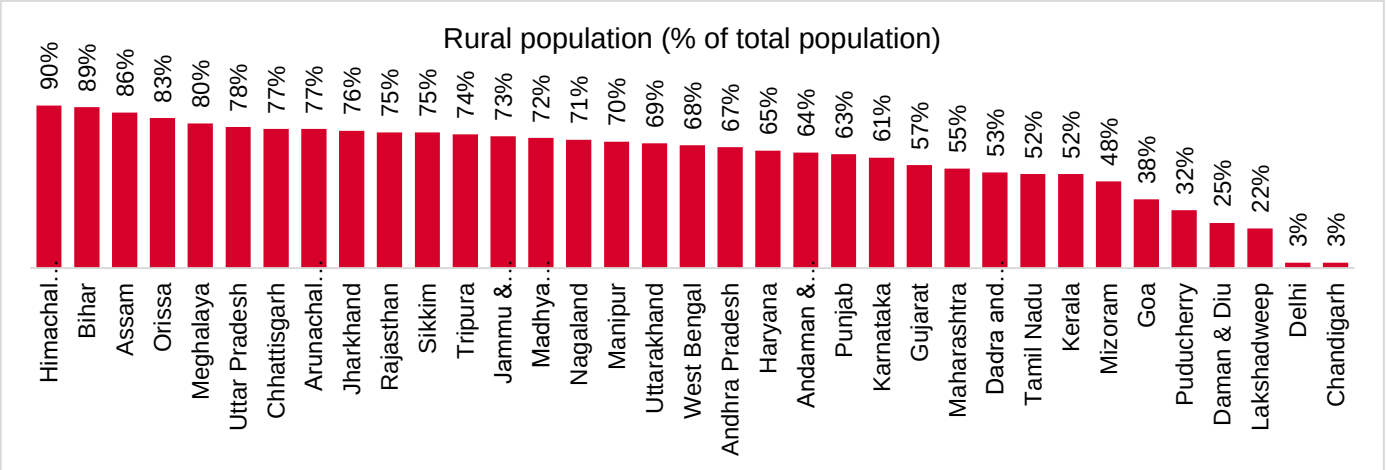
Source: RBI, CRISIL MI&A Research

Although the majority of Indian households are located in the rural region, the banking infrastructure in these regions is relatively inferior and, thus, there is a gap in the supply and demand of financial services in the backward regions of the country, which is a pocket of opportunity for the financial services sector.

With increasing financial penetration and access to financial services in the rural and semi-urban areas, the share of deposits in these areas have also increased over the last ten years. While the share of urban areas in the deposits distribution has reduced over the last decade, share of semi-urban and rural areas have seen an increase in share of deposits.

With a high proportion of population in the rural areas across the country, the financial institutions have less competition for banking services here compared with urban areas. Also, since the level of financial inclusion is lower, it presents a significant opportunity for these entities to penetrate these regions.

State-wise share of rural population (CY 2011)



Note: Sequence of states are arranged in descending order of the proportion of rural population
Source: Census 2011, CRISIL MI&A Research

2.2 State wise credit and deposit account penetration

Maharashtra and Tamil Nadu have registered highest credit account penetration in FY22

States like Andhra Pradesh, Karnataka and Uttar Pradesh have huge headroom for growth given the credit penetration and economic growth. Similarly, In the West, states like Maharashtra and Gujarat have showcased good growth in terms of GDP and Gujarat has a relatively lower credit penetration, which provides a huge potential to be addressed.

State-wise GDP and GDP growth (FY 2022)

States	GSDP - Constant Prices FY22 In Rs. Billion	Y-o-Y growth	CAGR (FY17-FY22)	Credit Account Penetration as on FY22	Deposit Account Penetration as on FY22	Branch Penetration as on FY22	ATM Penetration as on FY22	CRISIL Inclusix Score (FY2016)
Maharashtra	20,280	9.1%	2.3%	43%	176%	106	213	62.7
Gujarat	13,825	10.8%	7.1%	9%	157%	128	186	62.4
Tamil Nadu	13,451	8.0%	5.3%	14%	184%	144	337	77.2
Karnataka	12,297	11.0%	5.5%	10%	183%	151	259	82.1
Uttar Pradesh	11,814	9.6%	3.2%	2%	127%	77	100	44.1
West Bengal	7,878	10.8%	3.8%	4%	160%	91	123	53.7
Rajasthan	7,389	11.4%	4.4%	4%	135%	103	140	50.9
Andhra Pradesh	7,049	11.2%	5.5%	6%	156%	122	191	78.4
Telangana	6,607	10.6%	5.4%	15%	203%	158	318	72.8
Madhya Pradesh	6,007	10.4%	5.0%	4%	142%	90	132	48.7
Delhi	5,978	9.1%	3.2%	26%	292%	192	400	86.1
Haryana	5,681	11.3%	4.5%	11%	202%	177	235	67.7
Kerala	5,736	12.0%	3.4%	10%	211%	175	278	90.9
Bihar	4,281	11.0%	6.1%	1%	123%	62	73	38.5
Odisha	4,217	11.5%	4.6%	4%	149%	112	163	63
Punjab	4,234	6.3%	3.7%	10%	215%	212	239	70.9
Assam	2,625	8.1%	5.4%	4%	141%	84	120	47.9
Chhattisgarh	2,677	8.5%	4.6%	4%	145%	98	134	45.7
Jharkhand	2,368	8.2%	4.2%	3%	145%	90	106	48.2
Himachal Pradesh	1,244	8.4%	3.8%	5%	189%	213	268	72.3
Jammu & Kashmir	1,239	6.2%	NA	8%	157%	126	182	47.8
Uttarakhand	1,934	8.2%	2.9%	9%	284%	289	378	69.0
Tripura	405	8.7%	5.8%	43%	141%	140	129	66.2
Meghalaya	257	8.2%	3.4%	9%	96%	111	129	34.6

Note:

1. Credit account penetration is calculated as total number of retail bank credit accounts/population of the state

2. Deposit account penetration is calculated as total number of bank deposit accounts/ population of the state

3. Branch penetration is calculated as Number of bank branches per million people

4. ATM penetration is calculated as Number of ATMs per million people

5. For Credit and Deposit account penetration, this does not represent unique borrowers or depositors, total number of accounts have been considered

6. CRISIL Inclusix, India's first financial inclusion index, was launched in 2013 with the objective of creating a dependable yardstick that would become a policy input to further the cause of inclusion. CRISIL Inclusix weighs three service providers (banks, insurers and microfinance institutions) on four dimensions (branch, credit, deposit and insurance).

Source: RBI, MOSPI, CRISIL MI&A Research

2.3 Key steps taken by the government to boost financial inclusion

To improve financial inclusion, especially in rural areas, the government is focusing on improving the overall rural infrastructure for penetration of financial services as well as empowering the development of parallel supporting institutions. This has provided an opportunity for NBFCs and other financial institutions to cater to the unserved population or act as a channel between the larger financial institutions and other service providers to better serve the underserved customers.

Considerable progress has been made over the past 5-7 years to bring unbanked individuals into the formal banking system. The RBI and the government have taken several measures, such as:

Small Finance Banks (SFBs)

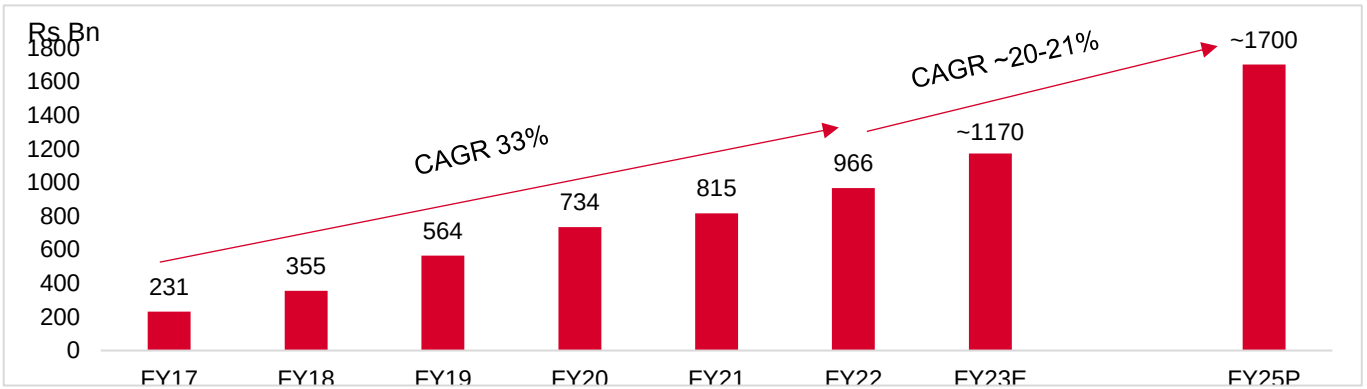
As of May 2023, there are 12 SFBs which aim to service the underserved customers through savings instruments, and supplying credit to small business units, small and marginal farmers, micro and small industries, and other unorganised sector/lending through informal channels. SFBs are also required to dedicate 75% of their Adjusted Net Bank Credit (ANBC) towards priority sector. For the SFBs, nearly 19% of their deposits arise from the rural and semi-urban areas, whereas the credit view shows a geographic skew with 39% of the advances in rural and semi-urban areas as of March 2022. This has led to increasing credit penetration in the rural areas, thereby ensuring financial inclusion.

Microfinance Institutions

Microfinance institutions (MFIs) and non-banking financial companies (NBFCs) are generally present in areas where commercial banks are not able to service customers. MFIs provide door to door service and strong engagement with borrowers, which makes their networks strong and help them open branches in underserved areas. The operating costs is relatively higher for MFIs given the expansive coverage required for financial inclusion in rural parts. Currently, MFIs charge a higher rate of interest to the customers, as most of their loan portfolio is unsecured or given to slightly risky customers. NBFCs rely on strong tailor-made products by continually introducing customised and flexible offerings for the underserved or untapped market after learning about the needs of the locals. MFIs have a significant role to play in furthering financial inclusion. As of December 31, 2022, 39% of microfinance is held by NBFC-MFIs with a total gross loan portfolio of Rs 1,150 billion.

According to the Microfinance Institutions Network (MFIN), NBFC-MFI had a borrower base of 37 million clients as of December 31, 2022. NBFC-MFIs had an average loan ticket size of Rs 42,687.

NBFC-MFIs GLP to grow at ~20%-21% CAGR between FY22-FY25



Note: E: Estimated, P: Projected
Source: MFIN, CRISIL MI&A Research

Payment banks

Another step taken towards financial inclusion was the RBI granting in-principle approval on August 19, 2015 to 11 players to launch payment banks, however, currently only 4 payments banks are operating in the country.

The objective of a payments banks is to widen the spread of payment services and deposit products to small businesses, low-income households, migrant workers and other unorganized entities by enabling high volume low value transactions in deposits and payments/remittance services in a secured technology-driven environment.

Payment banks can accept deposits, subject to a cap of Rs. 100,000 per customer, and provide payment and remittance services through channels, such as the internet, branches, business correspondents (BCs) and mobile banking. However, these banks cannot offer credit facilities directly, but can choose to act as a BC of another bank for credit and other services.

Along with maintaining a cash reserve ratio (CRR) with the RBI, payment banks are required to invest a minimum of 75% of their demand deposit balance in government securities eligible under the statutory liquidity ratio (SLR), with maturity of up to one year, and hold a maximum 25% in current and fixed deposits with Scheduled Commercial Banks (SCBs).

Business Correspondents (BCs)

In one of its foremost measures, the RBI introduced the BC model of banking outreach in January 2006, aimed at leveraging information and communication technology to widen access to the banking system. BCs are retail agents engaged by banks to offer banking services at locations other than a bank branch/ATM. They are authorised to perform a variety of activities including collection of small-value deposits, disbursal of small-value credit, recovery of principal, collection of interest, sale of micro insurance, mutual fund products, pension products, other third-party products, and receipt and delivery of small value remittances/other payment instruments. In July 2014, the RBI allowed NBFC-MFIs to work with banks as BCs.

Aadhaar

Adoption of Aadhaar and Aadhaar authentication in the Indian financial system is expected to transform the financial landscape. To increase financial inclusion, the Unique Identification Authority of India partnered with the RBI, National Payments Corporation of India (NPCI), Indian Banks Association (IBA) and banks to develop:

- Aadhaar Payments Bridge (APB) – The system was launched in 2011 to enable a smooth transfer of all government welfare scheme payments to a beneficiary's Aadhaar Enabled Bank Account (AEBA)
- Aadhaar enabled payment system (AEPS) – A system that leverages Aadhaar online authentication and enables AEBAs to be operated in anytime-anywhere banking mode by the marginalised and financially excluded via micro-ATMs

According to the Ministry of Electronics and IT, Aadhaar-generated unique identity covered over 99% of total estimated adult population of India, as of December 2020. An Aadhaar number is used to verify the identity of a person receiving a subsidy or a service. Disbursements take place through a centralised electronic benefit transfer system using the unique Aadhaar beneficiary numbers.

The Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Bill, 2016, came into effect on March 25, 2016, to strengthen the role of the Aadhaar card. The Bill aims at providing targeted delivery of subsidies and services to individuals residing in India by assigning them a unique Aadhaar numbers. To reduce the cost of consumer on-boarding and transactions, the government launched IndiaStack. IndiaStack is a set of APIs that allows

government businesses, start-ups and developers to utilise a unique digital infrastructure to solve problems, such as presence-less finance, paperless and cashless service delivery.

Also, Aadhaar-enabled micropayments have many features, including elimination of the need for individual KYC requirements by banks for no-frills or basic accounts, and reductions in the direct and indirect KYC cost of financial institutions on account of the UIDAI's 'know your residence' standards being sufficient for authentication.

Aadhaar-enabled payments with clear authentication and verification process allow financial institutions to network with village-based BCs. Thus, customers will be able to withdraw money and make deposits at the local BC. UIDAI's authentication will help banks verify residents both in person and remotely. The electronic transfer, backed by UIDAI's authentication, will help residents transact electronically, reducing the cost of transactions. Also, it has helped reduce the KYC approval turnaround time from the previous 10-15 days, when the customer had to submit various documents for identity and address proof, to almost-instant KYC approval.

Digital India

An umbrella programme to transform India into a knowledge economy has supported the financial inclusion initiative. Some of the initiatives under this programme include development of digital infrastructure, delivery of government services digitally and improvement in digital literacy, especially in rural India. Some of the initiatives are Direct benefits transfer, Common service centers 2.0 and BharatNet.

Priority sector lending aimed at facilitating financial inclusion

As per the RBI, priority sectors include:

- **Agriculture:** For all SCBs, 18% of the Adjusted Net Bank Credit (ANBC) or the credit equivalent amount of off-balance sheet exposure (CEOBE), whichever is higher, is to be extended for agriculture. Within the 18% target for agriculture, a target of 10% of ANBC or CEOBE, whichever is higher, has been prescribed for small and marginal farmers. Also, the sub-target of 10% of ANBC or the CEOBE, whichever is higher, is applicable for foreign banks with 20 branches or more, for lending to small and marginal farmers.

- **Social infrastructure:** A maximum bank loan of Rs 100 million can be extended per borrower to build social infrastructure, including schools, healthcare, drinking water, and sanitation facilities, as well as construction/ refurbishment of household toilets and household-level water improvements in tier II to VI centres. Bank credit to MFIs, extended for on-lending to individuals and to members of self-help groups (SHGs)/ joint lending groups for water and sanitation facilities, will be eligible for categorisation as the priority sector under 'social infrastructure'.

- **Renewable energy**: Bank loans up to Rs.300 million can be given to borrowers for solar-based power generators, biomass-based power generators, windmills, micro-hydel plants, and for non-conventional energy-based public utilities (street lighting systems), and remote village electrification. For individual households, the loan limit is Rs 1 million per borrower.

- **Microcredit:** As much as 7.5% of ANBC or the CEOBE for all SCBs should be given in the form of microcredit. Further, the sub-target of 7.5% of ANBC or CEOBE, whichever is higher, for banks' lending to microenterprises will also be applicable to foreign banks with 20 branches and above from fiscal 2019.

- **MSME:** The RBI has removed the currently applicable loan limits of Rs 50 million and Rs 100 million per borrower to micro/small and medium enterprises (services), respectively, for classification under the priority sector. Accordingly, all bank loans to MSMEs, engaged in the provision or rendering of services as defined

in terms of investment in equipment under the MSMED Act, 2006, will qualify under the priority sector without any credit cap.

- **Advances to weaker sections:** 12% of ANBC or the CEOBE, whichever is higher, must to be extended to weaker sections.
- **Education loans:** These include loans and advances granted to individuals only for educational purposes, including vocational courses, of up to Rs 2 million. These loans and advances will be considered eligible for the priority sector.
- **Housing:** The government has tried to bring greater convergence of PSL guidelines for housing loans with the
- Affordable Housing Scheme and boost low-cost housing for economically weaker sections and lower income groups. Thus, it decided to revise the housing loan limits for PSL eligibility from the existing Rs 2.8 million to Rs 3.5 million in metropolitan centres (with a population of 1 million and above), and from the existing Rs 2 million to Rs 2.5 million in other centres, provided the overall cost of the dwelling unit in the metropolitan centre and at other centres does not exceed Rs 4.5 million and Rs 3 million, respectively.

In September 2020, RBI new guidelines for PSL, wherein higher weights would be assigned to districts having a relatively lower credit penetration. From FY22, a weight of 125% would be assigned to incremental priority sector credit in identified districts where credit flow is lower and per capita PSL is lower than Rs 6,000. A lower weight of 90% will be assigned to incremental PSL in identified districts where credit flow is relatively higher and per capita PSL is more than Rs 25,000. Other districts will continue to have the existing weightage of 100%. This will incentivise credit flow to credit deficient geographies.

Financial inclusion index

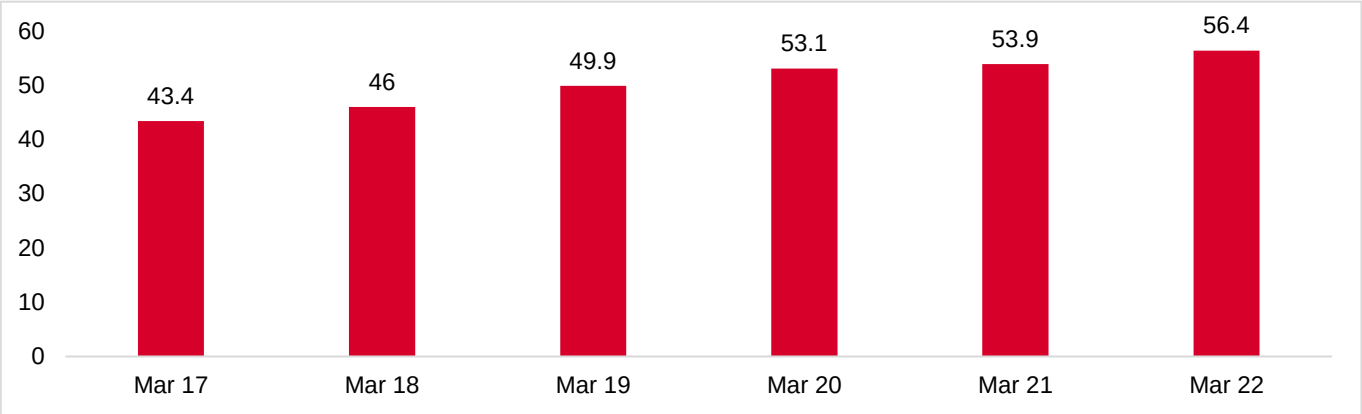
The Reserve Bank of India (RBI) has constructed a composite financial inclusion index (FI-Index) to capture the extent of financial inclusion across the country. The FI-Index has been conceptualized as a comprehensive index incorporating details of banking, investments, insurance, postal and pension sector. The index captures information on various aspects of financial inclusion in a single value ranging between 0 o 100 where 0 represents complete financial exclusion and 100 indicates full financial inclusion.

The FI-Index comprises of three broad parameters – Access (35%), Usage (45%) and Quality (20%) with each of these consisting of various dimensions which are computed based on number of indicators.

The Index is responsive to ease of access, availability and usage of services, and quality of services, comprising in all 97 indicators. A unique feature of the Index is the Quality parameter which captures the quality aspect of financial inclusion as reflected by financial literacy, consumer protection, and inequalities and deficiencies in services.

The FI-Index has been constructed without any ‘base year’ and as such it reflects cumulative efforts of all stakeholders over the years towards financial inclusion. The value of FI Index for March 2022 stands at 56.4 as against 53.9 in March 2021, with growth witnessed across all the sub-indices.

Financial inclusion has improved over the years

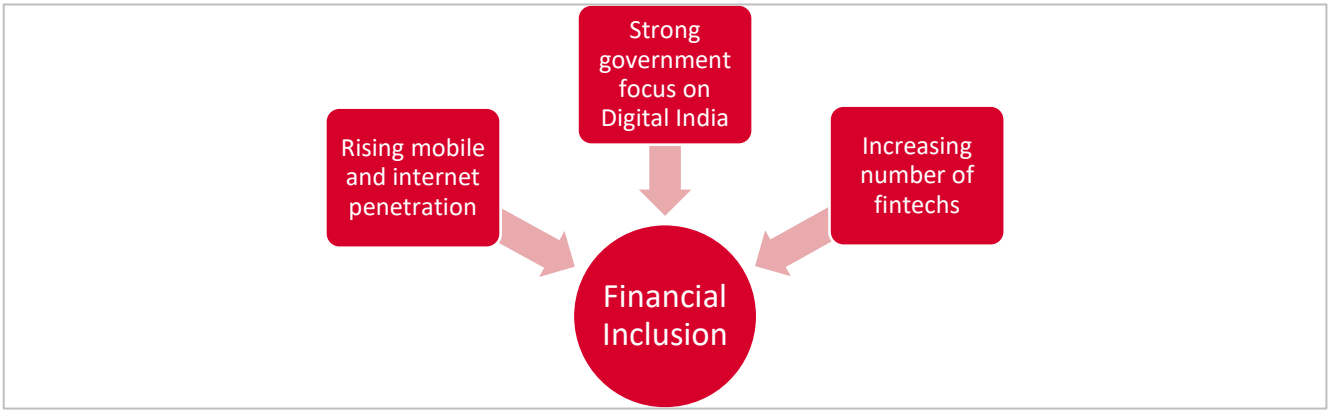


Source: RBI, CRIISL MI&A Research

2.4 Technology to aid financial inclusion in India

In India, technology has significantly improved the accessibility and affordability of financial services that were previously inaccessible to the unbanked or underbanked masses. In the past nine years, our country has accelerated the pace of financial inclusion. From 40% of Indian adults with a bank account in 2011, this number has consistently increased to 80% in 2018 according to the Global Findex Data. However, lower levels of financial literacy and lack of awareness, especially in rural India has led to only 48% of these accounts being active.

Conventional banking models are not feasible for low ticket size of transactions, deposits, loans, etc. in rural or remote areas and brick and mortar businesses are proving to be an uneconomical proposition for banks. Improving mobile and smartphone penetration, robust infrastructure laid down by the government to enable digitisation and rising number of fintechs in India will help in overcoming the challenges faced by the traditional banking model and lead to higher financial inclusion.



Fintech companies have been at the forefront of the growth in digital payments in India. These include payment companies that facilitate P2P and retail payments through mobile wallets or UPI as well as technology companies which provide hardware and POS devices for digital payments. The foundational digital infrastructure laid by Aadhaar and the India Stack has created the business case for many of these growing fintechs. New smartphone users and people exploring digital payments for the first time can be signed up at minimal costs based on their digital identities. For a number of fintechs, access to the India Stack is fundamental to their business models. Evolving business

models of these fintechs and strong focus of government on digitisation from granting licenses to building the infrastructure for digital payments landscape will lead to improving financial inclusion by tapping the underbanked population of India.

Neo-Banking

The banking sector has been increasing their focus on adopting digital methods of business and for that the traditional banks and NBFCs are tying up with various types of fintechs to provide several services through digital mode. Neobank business model is one of such kinds in which fintechs use conventional bank's network and become customer-facing banking service providers. These fintechs do not have banking license, however, they partner with banks and offer various banking services through their partner bank's system. These fintechs help banks in on-boarding various types of customers and businesses on to digital payments. The operations of these fintechs are driven by technology to provide banking services to their customers. These fintechs are helping in furthering financial inclusion in India.

Digital Transactions

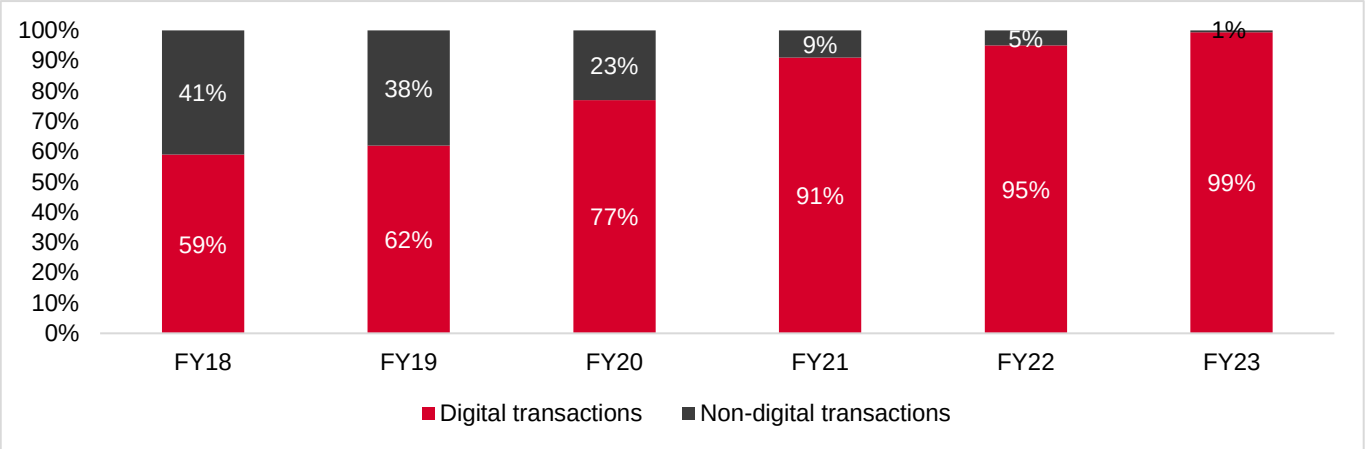
Increasing share of digital channels in domestic monetary transactions

The share of different channels in domestic money transfer has changed significantly over the past five years. Banks, for example, are witnessing a change in customer behaviour with fewer customers visiting bank branches for transactions. This change in behaviour was led by demonetisation when cash transactions slowed down, many new accounts were opened, and digital banking witnessed a surge in use and continued its growth trajectory. The preference has also shifted from cost factors to convenience and ease of performing transactions, which helps in saving time spent in queues, not disturbing the daily working hours and avoiding any potential monetary loss. Post-Covid-19, with consumers preferring to transact digitally rather than engage in physical exchange of any paper or face-to-face contact, digital transactions have received another shot in the arm.

Digital payments have witnessed substantial growth

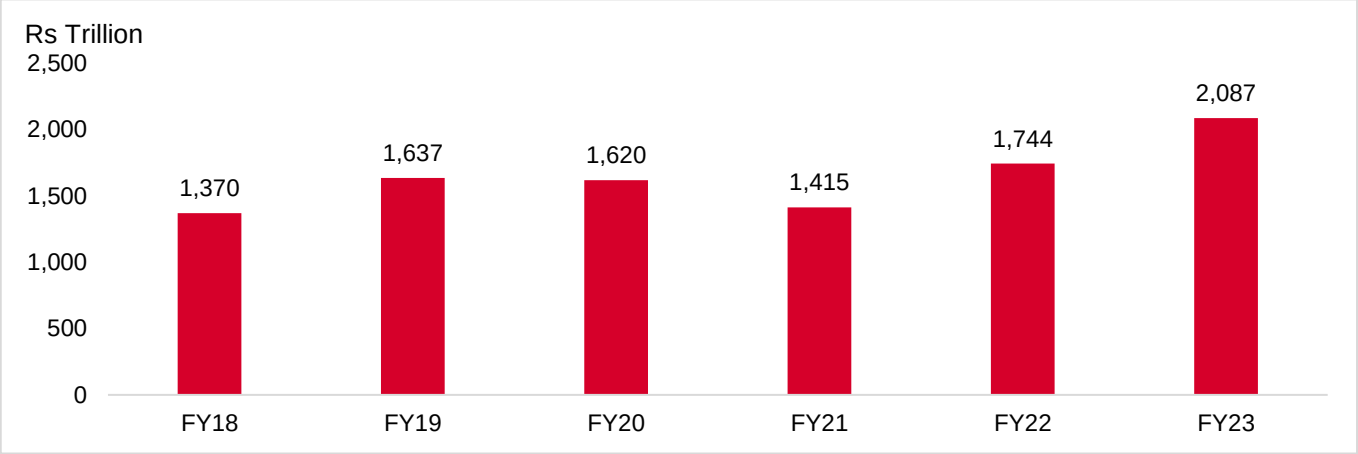
Total digital payments in India have witnessed significant growth over the past few years. Between Fiscal 2018 and 2023, the volume of digital payments transactions has increased from 14.6 billion to 113.9 billion, causing its share in overall payment transactions to increase from 59% in Fiscal 2018 to 99% in Fiscal 2023. During the same period, value of digital transactions has increased from Rs. 1,371 trillion in Fiscal 2018 to Rs 2,087 trillion in Fiscal 2023.

Trend in volume of digital payments



Note: Digital Payments includes RTGS payments, Credit transfers (AePS, APBS, ECS Cr, IMPS, NACH, NEFT, UPI), Debit Transfers (BHIM, ECS Dr, NACH Dr, NETC), Card Payments (Debit and Credit Cards) and Prepaid Payments Instruments.
Source: RBI, CRISIL MI&A Research

Trend in value of digital payments



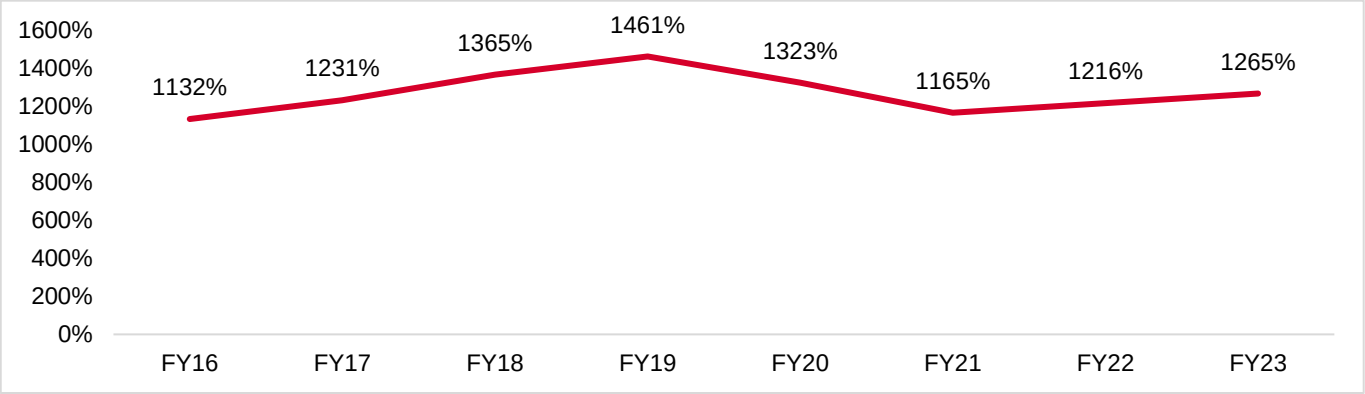
Note: Digital Payments includes RTGS payments, Credit transfers (AePS, APBS, ECS Cr, IMPS, NACH, NEFT, UPI), Debit Transfers (BHIM, ECS Dr, NACH Dr, NETC), Card Payments (Debit and Credit Cards) and Prepaid Payments Instruments.

Source: RBI, CRISIL MI&A Research

Consumers are increasingly finding transacting through mobile convenient. CRISIL MI&A Research expects the share of mobile banking and prepaid payment instruments to increase dramatically over the coming years. In addition, CRISIL MI&A Research expects improved data connectivity, low digital payment penetration and proactive government measures to drive digitalisation in the country, transforming it into a cashless economy.

The value of digital transactions as a proportion of private consumption expenditure in between fiscal 2016 and fiscal 2023 also rose from 1132% to 1265%, which shows that the usage of digital transactions for consumption has been on the rise over the past few years.

Digital transaction value as a % of private final consumption expenditure (PFCE)



Note: PFCE is based on current prices.
Source: RBI, CRISIL MI&A Research

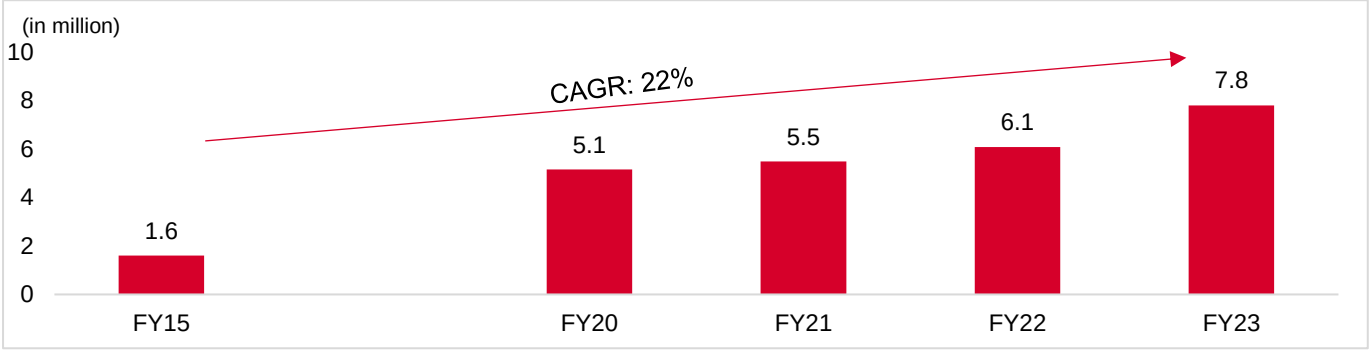
2.5 Factors behind growth in digital transactions

In India, the Central bank has been the primary enabler of digital transactions in India. Over the years, it has laid emphasis on the development of digital payment ecosystem, right from conceptualisation to execution and propelling investments in technology to enable the customer to transact in a seamless manner while addressing security concerns. This, along with rising internet penetration, increasing usage of cards, acceptance and adoption of various payments infrastructure and e-commerce platforms and changing consumer behaviour is expected to enable and drive digital transactions in the country.

Increase in cards and POS terminal to augment digital transactions

Over the last decade, the usage of debit and credit cards in India has increased substantially. Between fiscal 2011 and 2023, the number of debit cards issued in the country has increased from 230 million to 961 million, while issued credit cards has increased from 20 million to 85 million. As more cards are getting issued, there has been a growth in the acceptance infrastructure as well. Between fiscal 2015 to fiscal 2023, the POS infrastructure in the country registered a 22% CAGR to reach 7.8 million terminals. CRISIL MI&A Research expects this trend to continue, resulting in an increase in digital transactions.

Deployment of POS terminals clocked a 22% CAGR between FY15 to FY23

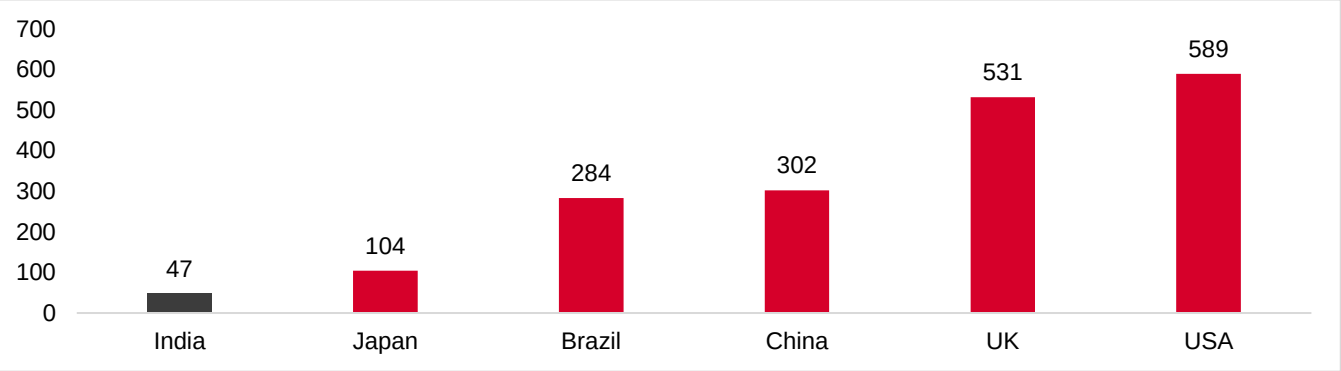


Source: RBI, CRISIL MI&A Research

Low penetration of per-capita digital payments transactions

According to Bank of International Settlements (CY 2021), non-cash payments transactions volume per capita in India is the lowest compared to other countries, which shows preference to cash mode of payment by people in India and also presents a strong headroom for growth in digital payments. The government has taken multiple initiatives to give a fillip to digitalisation in the country. This includes biometric identification of all Indian citizens through the Aadhaar programme, financial inclusion initiatives, launch of UPI and other digital payment systems and giving a push to online tax filings.

Number of non-cash payments transactions per capita, per annum (CY 2021)



Source: Bank of International Settlements, CRISIL MI&A Research

Products like contactless and digital cards to enable greater digital transactions

Introduction of contactless cards has enabled users to just tap and pay for transactions under Rs 2,000 by using the card at a contactless payment machine. Payment service providers are exploring innovative payment infrastructure by leveraging host card emulation (HCE) for secure near field communication (NFC) payment transactions. This will enable customers to easily use their cards on their NFC enabled smartphones to make contactless payments. The card issuers are also innovating and have introduced digital or virtual cards in the last one year. The digital card arrives in the individual's mobile application and has features like Touch ID or Face ID for authentication, which increases the convenience of transactions on e-commerce and other platforms. Further, significant growth in users over the last decade for payment apps and wallets such as PayTM, MobiKwik, and PhonePe are also enabling digital transactions in the ecosystem.

2.6 Business opportunities available owing to financial inclusion on the asset and liability side

Factors such as lack of documents, migration of individuals for work or other purposes, lack of transaction history with financial institutions, etc., have led to low inclusion of households in the financial system. Also, the costs involved in setting up a network to serve the traditionally ignored categories, such as migrants, rural population, retailers, shop owners, and MSMEs, is high.

In addition, the gap between various regions of the country, as highlighted above, is very wide. However, owing to the government's emphasis and growth of the banking facility in these regions, the gap is slowly getting plugged. This gives financial institutions an opportunity to expand their services in underserved regions.

Key business opportunities among various population categories - assets and liabilites

Migrants - ~100 million migrant workforce
•Remittance services •Account services •Deposit services
Retailers - ~24-25 million retail outlets
•Payments •Loans • Digitalisation of business functions
MSME - ~63.4 million businesses
•MSME loans •Working capital finance •Fee-based services
Rural population - ~ 66% of India's population
•Basic banking services •Personal loans •Bill payments and bookings •Investment in mutual funds and insurance products •Education loans •Gold loans

Source: CRISIL MI&A Research

2.7 Impact of Digital rupee on payments ecosystem

Central Bank Digital Currency (CBDC) is a digital form of currency notes issued by a central bank (RBI). Supported by the state-of-the-art payment systems of India that are affordable, accessible, convenient, efficient, safe and secure, the digital rupee system will bolster India's digital economy, enhance financial inclusion, and make the monetary and payment systems more efficient. It is expected to have greater impact on payments system ecosystem, some of the impacts are mentioned below:

Reduction in cost associated with physical cash management

Cost of cash management in India has continued to be significant. As per the RBI, the total expenditure incurred on security printing during April 1, 2021, to March 31, 2022 was Rs. 49.85 Bn. CBDC affects the overall value of the money issuing function to the extent that it reduces operational costs e.g. costs related to printing, storage, transportation and replacement of banknotes, and costs associated with delay in reconciliation and settlement. Though, at the outset, establishing a CBDC creation/issuance may entail significant fixed infrastructure cost, but subsequent marginal operating costs shall be very low. Complementing the higher cash requirement of the country, CBDC will lead to lowering of cost as it would obviate the need of many processes associated with distribution of physical currency across the country. Further, given the geographical spread and pockets were making physical cash available is a challenge, CBDC is expected to facilitate seamless transactions.

Promote digitization

In India, the cash in economy has shot up despite rapid digitization in the payments space. The growing use of electronic medium has not yet reduction in the demand for cash. The digital revolution has resulted an array of digital payments options for the people. Consumers now have a range of options to choose from when selecting a payment

method to complete a transaction. They make this selection based on the value they attribute to a payment method in a certain situation as each payment mode has its own use and purpose. The shift from cash to electronic payments increases the reliance on electronic payment systems, which has implications for the diversity and resilience of the payments landscape.

CBDC could further enhance resilience in payments and provide core payment services outside of the commercial banking system. It can provide a new way to make payments and also diversify the range of payment options, particularly for e-commerce (where cash cannot be used, except for the Cash on Delivery (COD) option). The CBDC based payment system is not expected to substitute other modes of existing payment options rather it will supplement by providing another payment avenue to the larger public.

Support financial inclusion

Some of the existing challenges to financial inclusion include limited physical infrastructure - especially in remote areas, poor connectivity, non-availability of customized products, socio-cultural barriers, lack of integration of credit with livelihood activities or other financial services across insurance, pension etc. With suitable design choices, CBDC may provide the public a safe sovereign digital money for meeting various transaction needs. It shall make financial services more accessible to the unbanked and underbanked population. The offline functionality as an option will allow CBDCs to be transacted without the internet and thus enable access in regions with poor or no internet connectivity. It shall also create digital footprints of the unbanked population in the financial system, which shall facilitate the easy availability of credit to them.

Universal access attributes of a CBDC including offline functionality, provision of universal access devices and compatibility across multiple devices, shall prove to be a gamechanger by improving the overall CBDC system for reasons of resilience, reach and financial inclusion.

Impact on business correspondents (BCs)

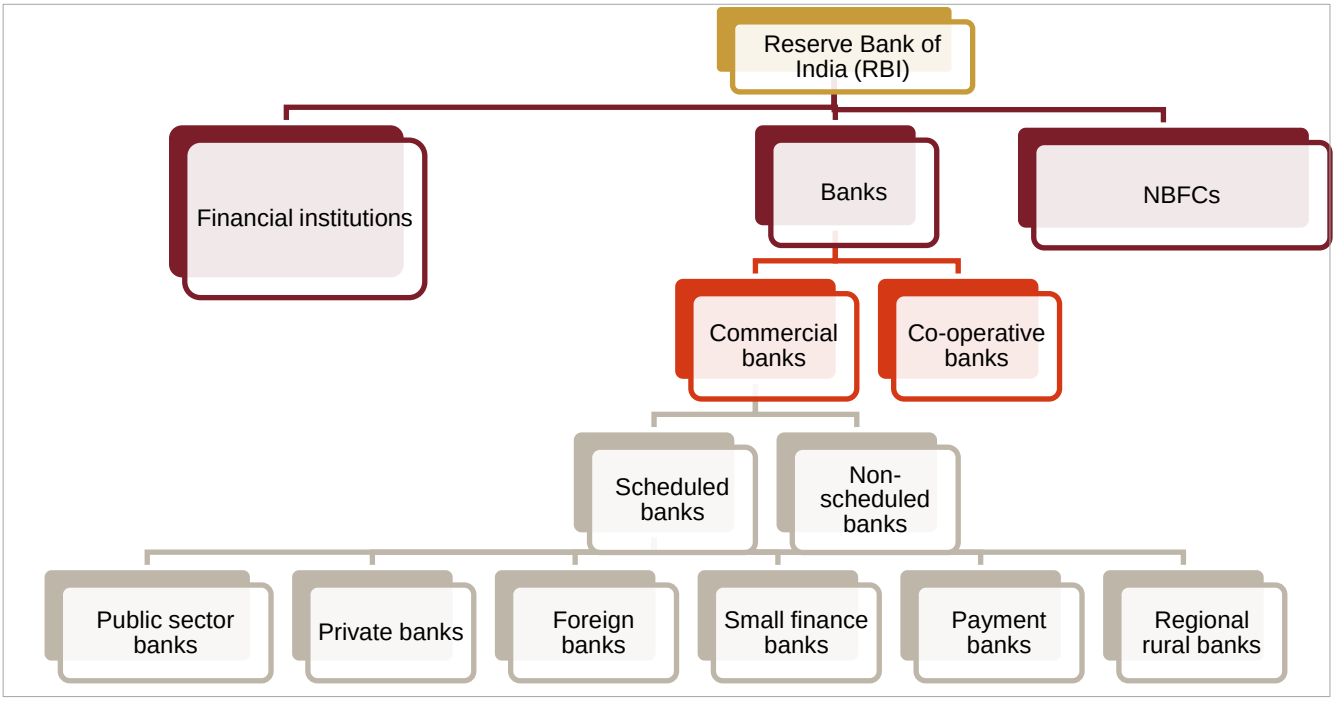
Digital rupee has the potential to create payments transfer platform that contributes to a more resilient, innovative, and competitive payment system for households, businesses and economies. It is likely to further improve efficiency in payments system by ensuring its users access safe digital money. The CBDC is freely convertible against the physical currency, which means the digital currency can be exchanged for cash equivalent to paper notes. Unlike UPI, a customer doesn't need a bank account to transact using e-rupees. It will work like existing forms of financial transactions and offer users another alternative to making payments. Therefore, it shall provide an additional avenue for BCs to carry out payment transactions. Further innovations in structure of payments would provide BCs with additional revenue streams. Additionally, BCs face risk of theft or fraud when cash is involved. Digital rupee would reduce the risk of theft, fraud, or damage to the physical notes which are subject to wear and tear while in circulation.

3 Business correspondent industry in India

3.1 Banking structure in India

The Indian banking system consists of 12 public sector banks, 21 private sector banks, 45 foreign banks, 43 regional rural banks, 12 SFBs, 6 payments banks, 1,514 urban cooperative banks (March 2022) as of December 2022. All the banks fall under the purview of the RBI.

Structure of Indian banking system



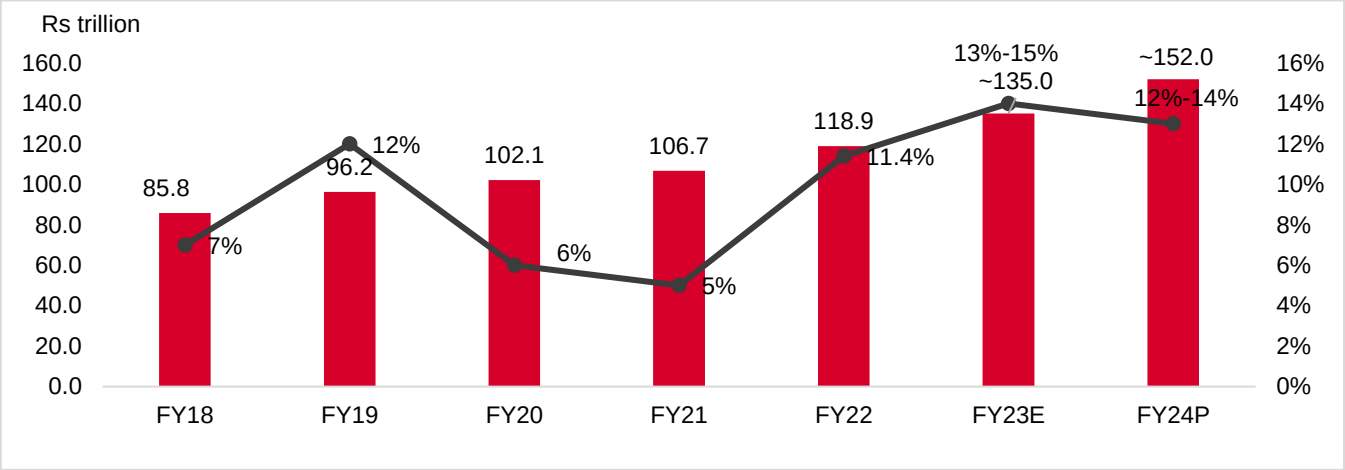
Note: All India Financial Institutions includes NABARD, SIDBI, EXIM Bank

Source: RBI, CRISIL MI&A Research

3.2 Banking credit

In the first half of fiscal 2022, the second wave of the pandemic forced both borrowers and lenders to tread cautiously, leading to muted growth in bank credit. Growth picked up in the third quarter of fiscal 2022 therefore recording a high double-digit growth of ~11% during the fiscal. CRISIL MI&A Research expects bank credit to grow at around 12% to 14% CAGR between fiscal 2023 and fiscal 2024, with growth led by the retail and agriculture segments and supported by visible recovery in service segment, with pent up demand in NBFCs and trade segment, and industrial credit.

Banking credit recovered in fiscal 2022, to grow at 12% to 14% for fiscal 2024

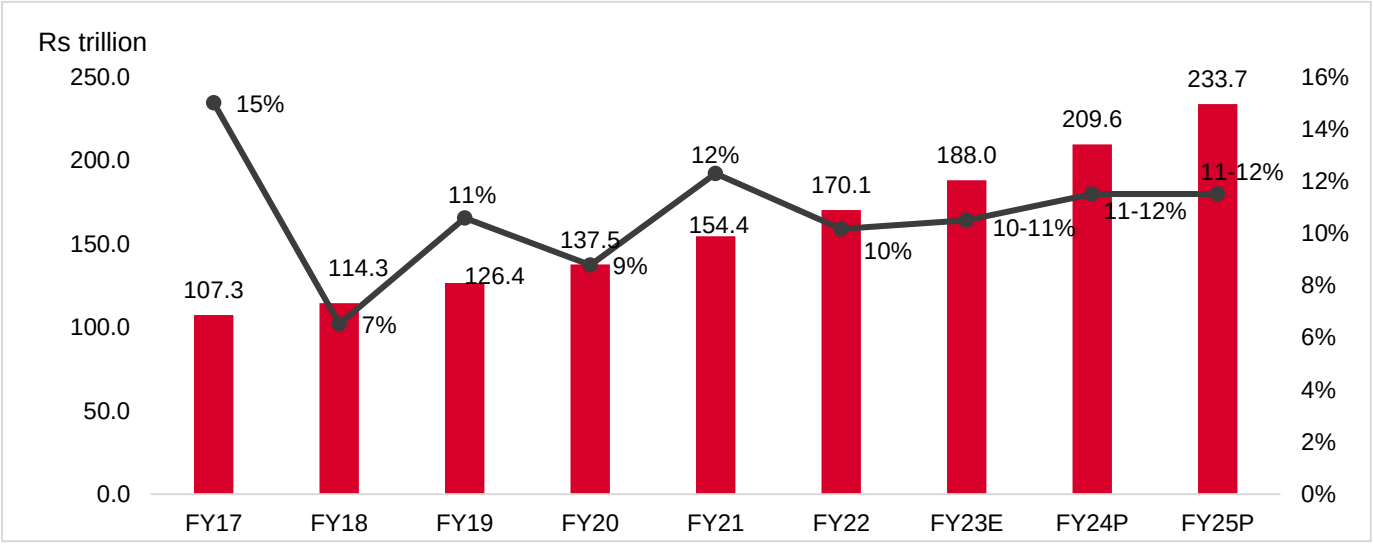


Note: E: Estimated, P: Projected
Source: RBI, CRISIL MI&A Research

3.3 Banking deposits

The banking sector enjoyed a healthy deposit compound annual growth rate (CAGR) of ~9% between fiscals 2017 and 2022. With the outbreak of Covid-19 in fiscal 2021, conserving money became a priority and households reduced their private consumption, leading to 11% deposit growth in the fiscal. During the monetary policy meeting in April 2022, RBI started the interest rate hike with 40 bps followed by 185 bps hike till December 2022 taking repo rate to 6.25%. Further, the incremental credit to deposit ratio rose to more than 100% during the second quarter of fiscal 2023 and deposit growth continued to lag credit growth. CRISIL MI&A Research expects the deposits rate to inch up with increase in competition and to support the credit growth. This will also support the deposits growth between fiscal 2023 and fiscal 2025 at 10%-11% CAGR.

Deposit at SCBs to grow at a ~11% CAGR between fiscal 2023 and fiscal 2025

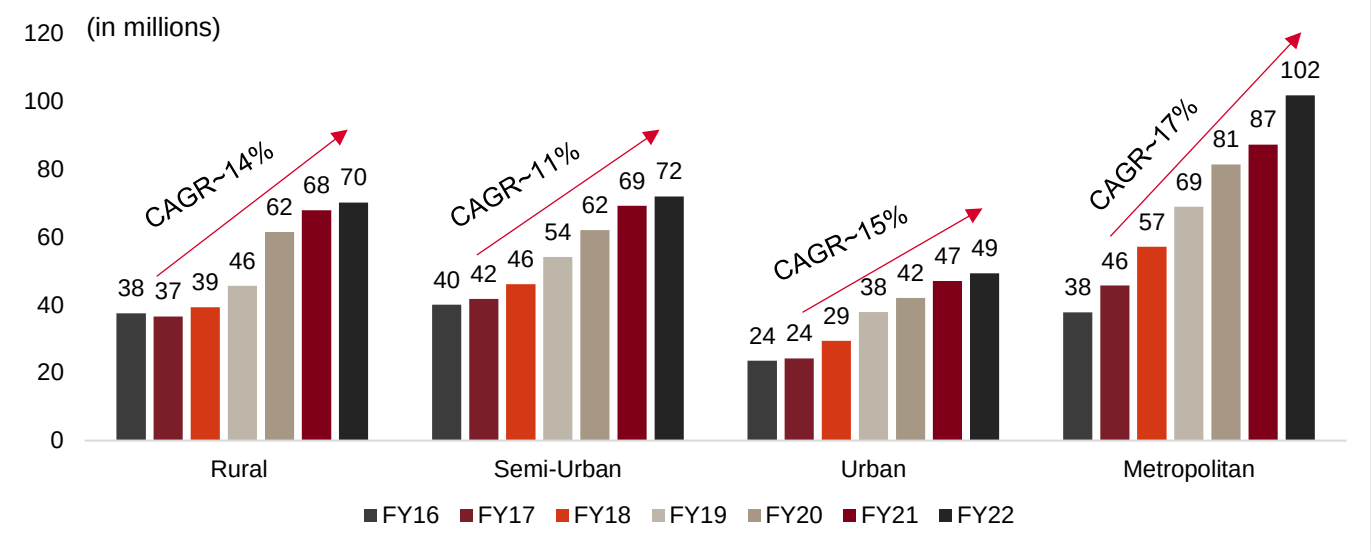


Note: E = Estimated, P = Projected; Source: RBI, CRISIL MI&A Research

3.4 Banking deposit and credit accounts in India

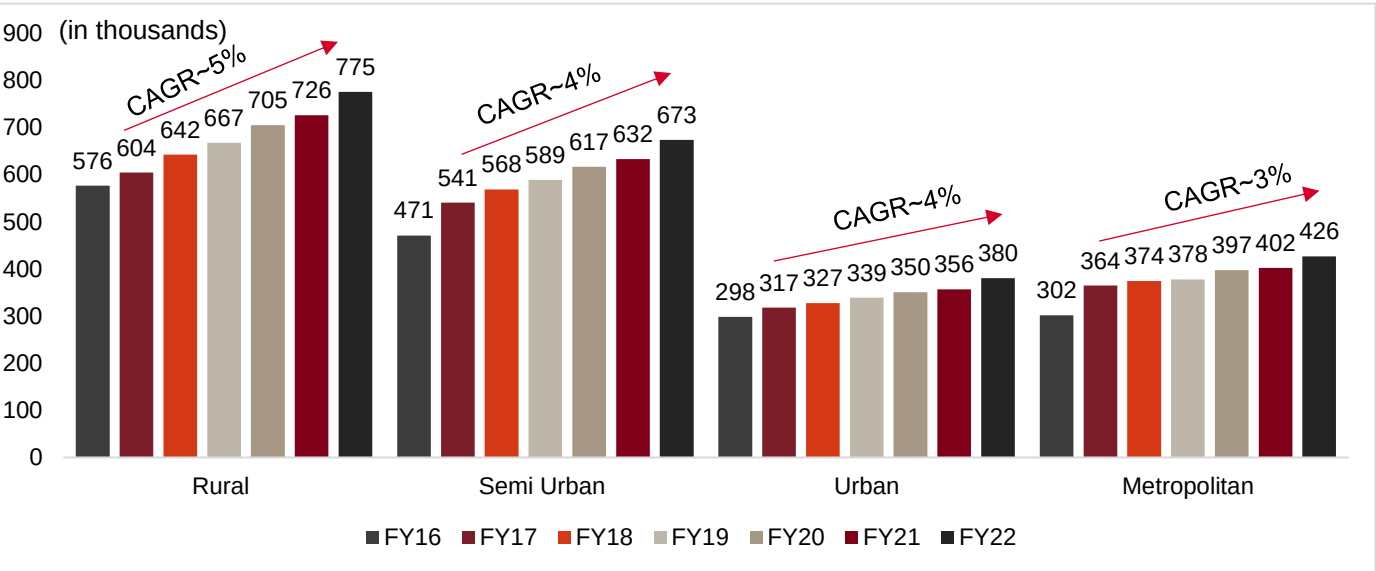
The number of bank credit accounts in rural areas grew at a 14% CAGR between fiscal 2017 and fiscal 2022; further, the number of bank deposit accounts grew at a 5% CAGR between the fiscal 2017 and fiscal 2022. Increase in banking credit and deposit accounts in rural and semi-urban areas would give a boost to the BC business as it may increase the value and volume of transactions through BCs.

Bank credit accounts in rural, semi-urban and urban areas



Note: Data represents only bank credit accounts; Source: RBI; CRISIL MI&A Research

Bank deposit accounts in rural, semi-urban and urban areas



Note: Data represents only bank deposit accounts
Source: RBI; CRISIL MI&A Research

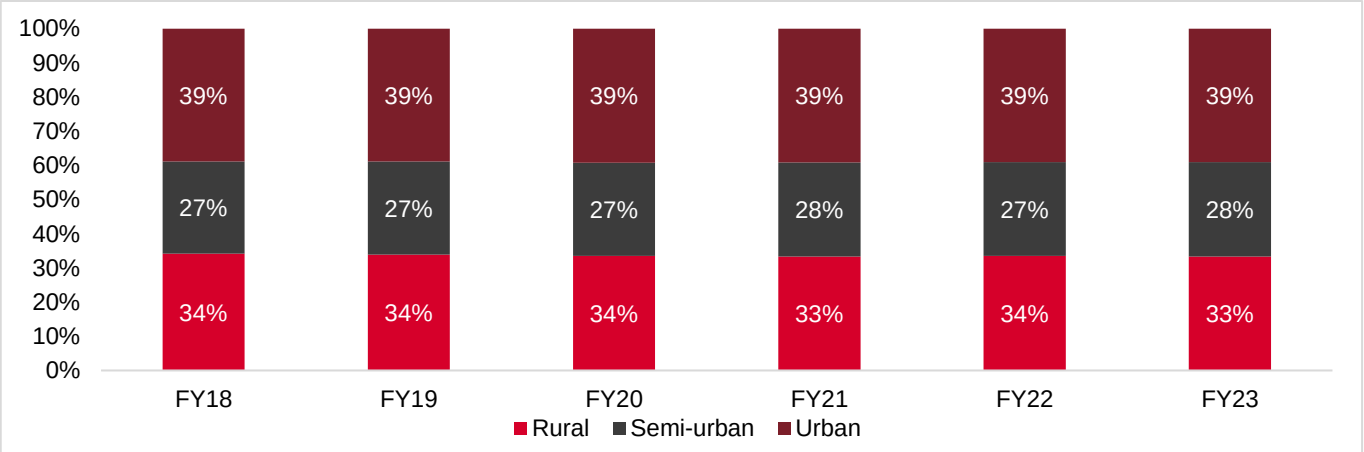
3.5 Banking branches in India

Bank group	Number of branches (March 2023)	5-year CAGR (number of branches)
Public sector banks	90,445	-1%
Private banks	42,279	7%
Foreign banks	835	17%
Regional rural banks	22,442	1%
Small Finance banks	6,688	59%
Payment banks*	741	131%
Total	163,430	

Note: Payments banks data is as of December 2022; Source: RBI; CRISIL MI&A Research

The number of public sector banks reduced from 27 in March 2017 to 12 as of March 2023. Therefore, total number of public sector bank branches have slightly reduced due to consolidation among public sector banks. The number of branches in the urban region has the highest share with 39% in fiscal 2023, followed by rural region and semi urban region with 33% and 28% share respectively. Due to lower share of banking branches in rural and semi-urban areas, it may present an opportunity for BCs to cover more such areas.

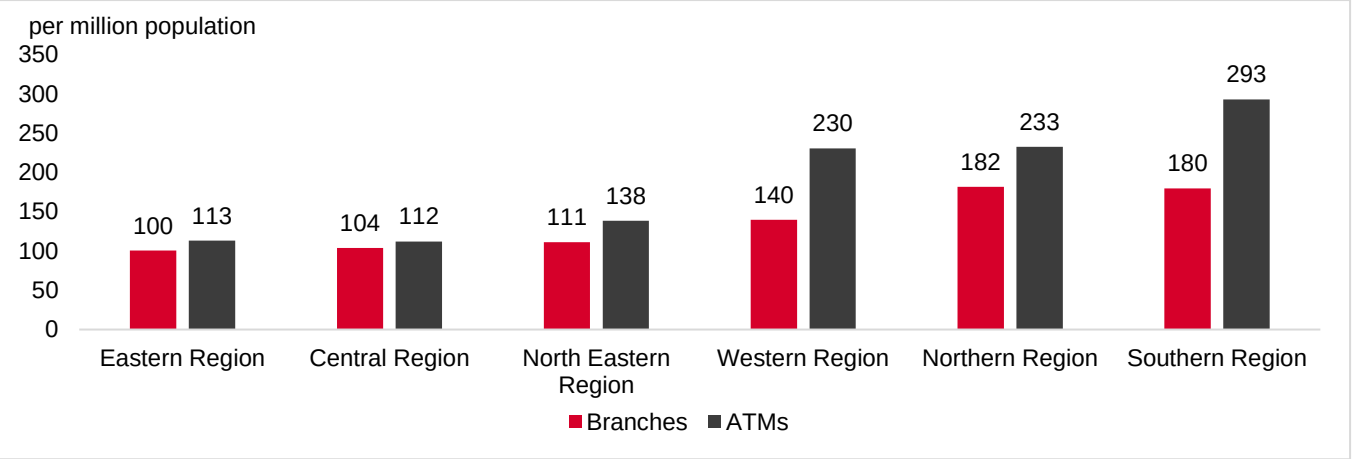
Bank branch distribution in rural, semi-urban and urban areas



Source: RBI; CRISIL MI&A Research

The number of branches and ATM facilities in the eastern regions, where credit penetration and deposit-base are low is also below those of the southern and western regions. Despite existing branch and ATM network, there remains scope for further penetration and huge opportunity in terms of expanding the financial inclusion parameters.

Region-wise presence of bank ATM and branches (as of March 2023)

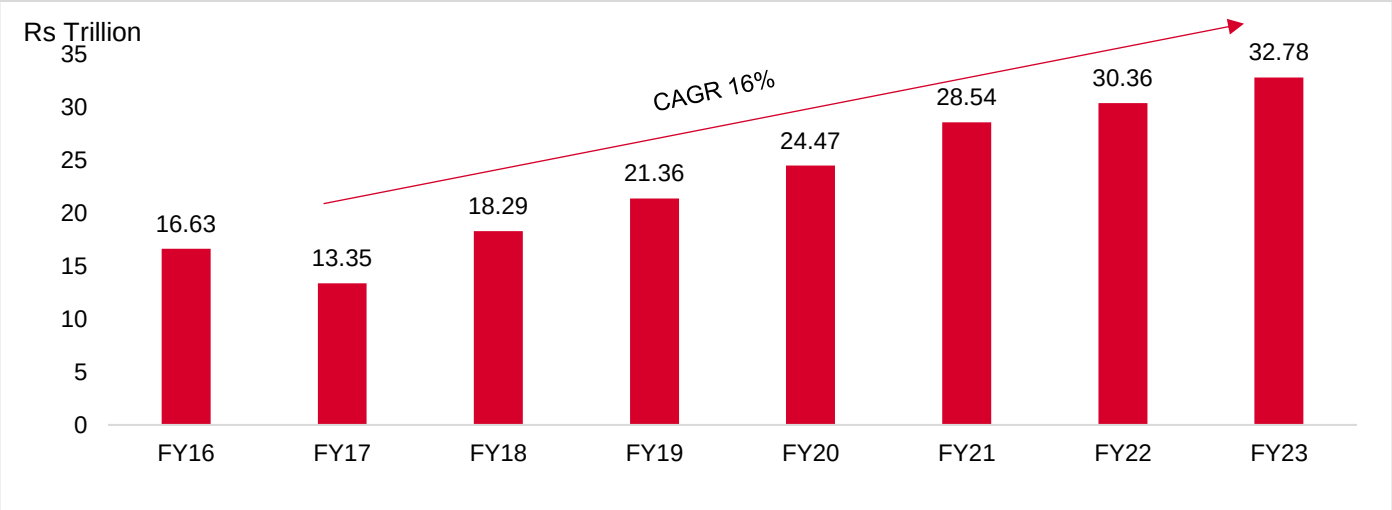


*Note: *Population is as per the census data of 2011*
Source: RBI; Census India; CRISIL MI&A Research

3.6 Assessment of cash in circulation in India

The cash in circulation (CIC) recorded strong growth of 16% (in value terms) CAGR during FY17 to FY23 even as digital payment also continued its strong growth during the period. Money supply is an important factor for economic development. CIC normally increases during times of heightened economic activity, with people requiring more money for transactions. CIC in India has been continuously growing (except during demonetization period) to reach INR 32.78 trillion in FY23.

CIC grew at CAGR ~16% from FY17 to FY23



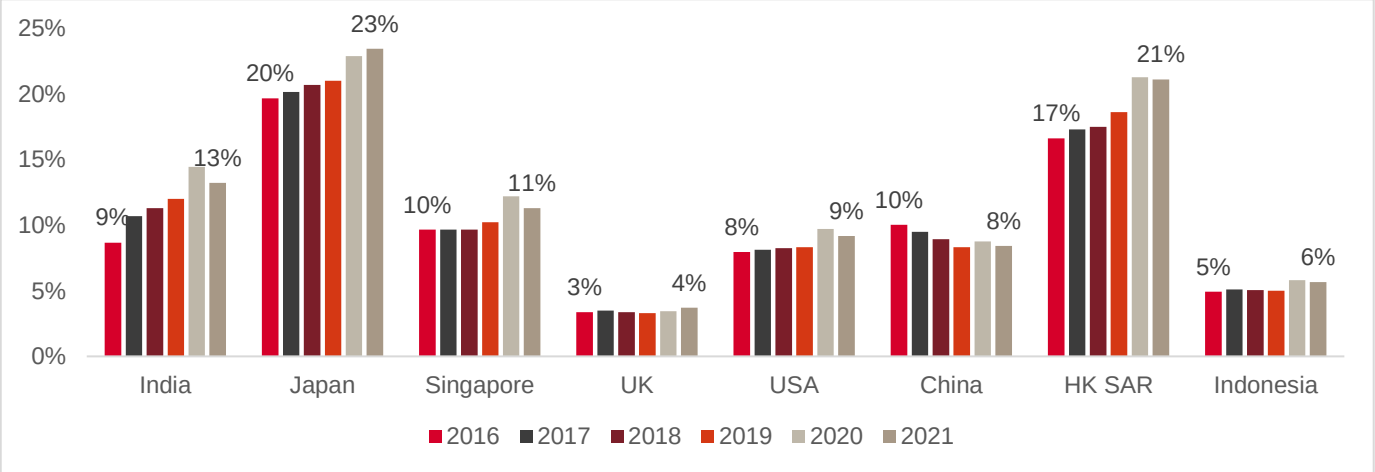
Source: RBI, CRISIL MI&A Research

Demand for currency depends upon several macro-economic factors including economic growth, interest rate level and demographic profile of the country. The ratio of CIC as percent of GDP provides an indicator of the dependence of cash in an economy. Cash is, however, used both as a means of payment and store of value.

With the onset of Covid-19 pandemic, there was a dash for cash across all jurisdictions. Lockdowns were severe in India, as a result of which economic activity slowed down and there was contraction in GDP, relative to other countries. The decline in GDP (denominator) contributed considerably to increase in CIC as percent of GDP for India

in 2020. Among the countries selected for comparison, only Hong Kong (21.3%) and Japan (22.9%) had a higher ratio of CIC as a percentage of GDP as compared to India. Macroeconomic deviations (Demonetization, GST, Covid-19, etc.) have not impacted CIC growth in the long-term.

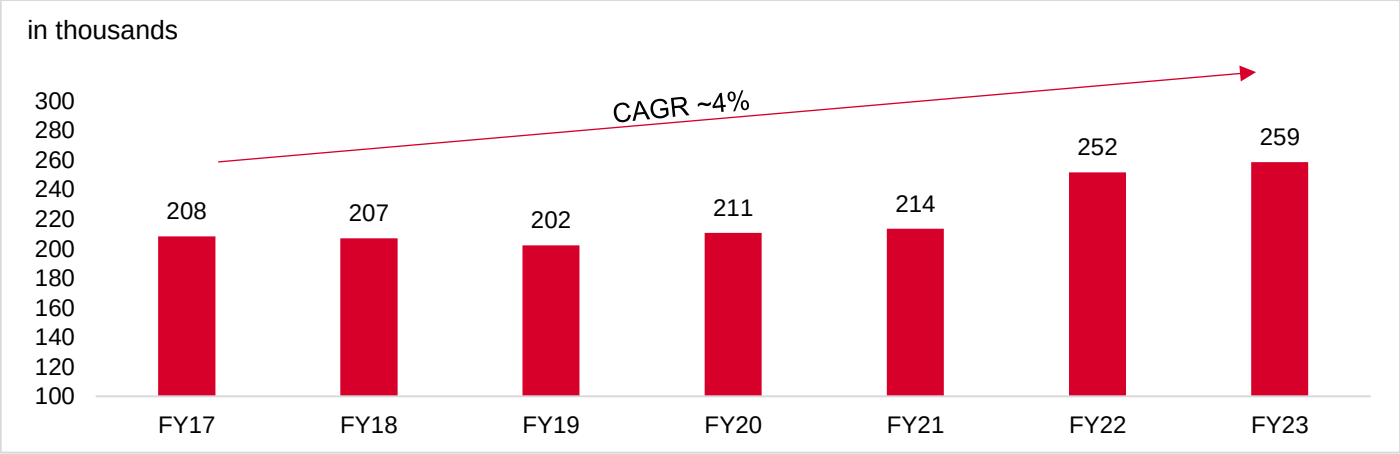
CIC as % of GDP increased considerably for India in 2020, however decreased a bit in 2021



Source: RBI, Bank for International Settlements, CRISIL MI&A Research

ATMs primarily form a part of the cash infrastructure. However, ATMs are also increasingly being used to conduct other activities like deposits, bill payments, transfers between accounts, etc., obviating the need to visit a bank branch and thereby acting as a means of undertaking 'digital transactions' albeit at a restricted scale. In India, authorised non-bank entities are also permitted to deploy ATMs, known as White Label ATMs, to support proliferation of ATM infrastructure across the country. In India, account holders in rural areas often withdraw cash from PoS terminals with Business Correspondents (BCs) and merchants in their neighbourhood, which act as "micro-ATMs". These BCs use AePS, which allows online interoperable transactions at micro-ATMs using Aadhaar based authentication. As of March 2023, there were more than 1.6 Mn micro-ATMs deployed in India along with around 7.8 Mn PoS machines.

Number of ATMs in India grew at CAGR of ~4% over FY17-23

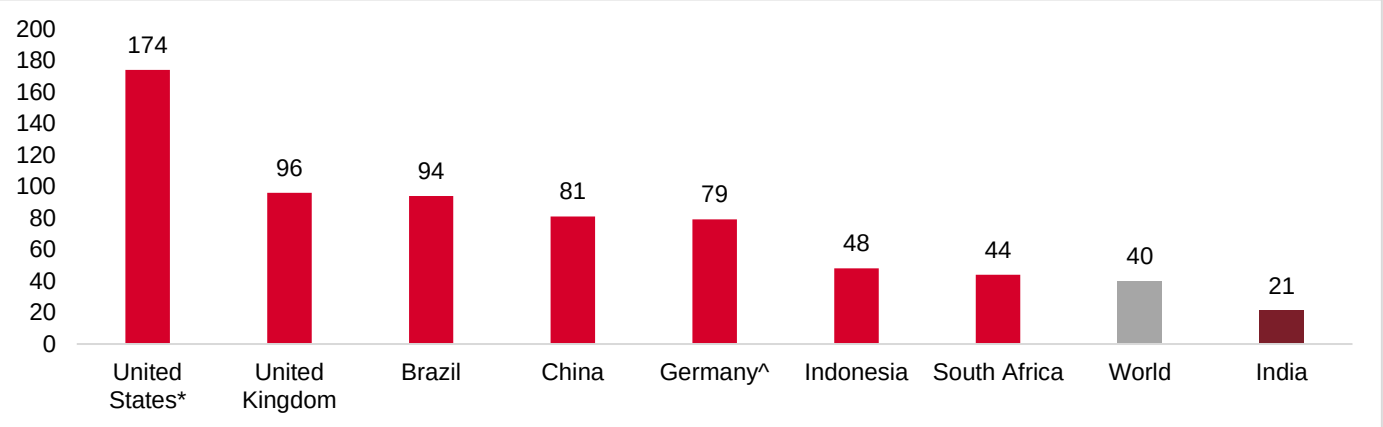


Source: RBI, CRISIL MI&A Research

The ATM per 1 lakhs adult is an important indicator representing the availability of ATMs across the country. A low number of ATMs per 1 lakh adults indicates that the existing ATM infrastructure may not be able to cater to the demands of the population.

With 21 ATMs per 1 lakhs adult in India, the penetration is significantly lower than the World average and India stands at the bottom when compared with other benchmarked countries.

ATMs per 1,00,000 adults (CY2021) in India lower than world average

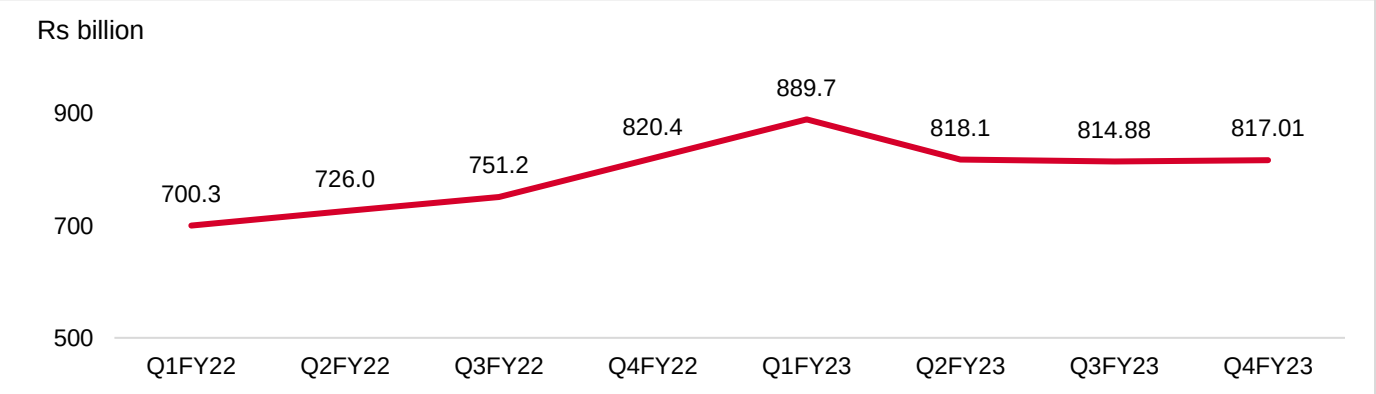


Note: (*) – US data is as of 2009 calendar year, (^)-Germany data as of 2020 calendar year
Source: World Bank, RBI, CRISIL MI&A

ATM withdrawals continue to rise

In fiscal 2023, the value of withdrawals from ATMs has reached ~Rs. 33 trillion, up by around 6% from Rs. 31 trillion in fiscal 2022. The ATM infrastructure is supplemented by micro-ATMs, which are primarily available to the rural / unbanked population and play a crucial role in facilitating financial inclusion in India. At micro-ATMs, cash withdrawal witnessed significant jump from Rs 2.2 trillion in fiscal 2021 to Rs 3.3 trillion in fiscal 2023. Therefore, the low penetration of ATM infrastructure in the country paves way for growth of micro-ATM infrastructure through BCs.

Cash withdrawal from Micro-ATMs (AePS) rising



Source: RBI, MOSPI, CRISIL MI&A Research

While digital payments are increasingly becoming popular, cash also remains a significant mode of doing day-to-day transactions, especially in semi-urban and rural areas. The lack of adequate trust and comfort with technology has restricted digital transactions and discouraged people from using these payment modes. As a result, cash is still a preferred mode of payment in rural India due to comfort in transacting through cash. Furthermore, public preference has shifted to withdrawing cash on an as-needed basis instead of making large withdrawals at storing cash at home.

3.7 State of business correspondents

A Business correspondent (BC) is an entity which acts as a teller for the bank and carry out a full range of transactions on behalf of the bank, in return for commissions on the services rendered. It is a model that enables people in remote areas of India to access formal financial institutions. The RBI has also allowed banks to designate business facilitators, which can refer customer proposals or facilitate banking transactions, but are not allowed to carry out actual transactions.

The concept of BCs is to address the needs of banks, which need to reach out to a wider section of society, as well as underprivileged people with no access to credit. With no access to credit, underprivileged people often have to invest their personal savings in health and entrepreneurial activities, leaving them highly vulnerable to adverse circumstances. Started in 2006-07, Zero Mass Private Limited (now a subsidiary of BLS E-services Limited) was the first ever business correspondent in the history of Indian banking system.

BCs during lockdown

During lockdown due to Covid-19, many people struggled to avail banking services although those were considered as essential services. Lockdown restricted banking hours at the branches and ATMs were located at distant locations in rural and semi-urban areas, which further aggravated the situation. However, business correspondents channel of banking provided big support during the lockdown. BCs carried out banking activities at the doorstep of people and facilitated them to withdraw cash. Several people benefitted due to BCs as they were able to withdraw cash which they received from the government through direct benefits transfer schemes.

3.8 Types of BCs

Some of the intermediaries are small-time shop owners and retired workers that set up their own individual service for extra income or may work as agents to the large fintech BCs.

Others are corporates that are further enabled by technology advancement and have their independent strategic approach. These corporates are either diversified service providers which offer various products and functionalities to customers all under one roof or act as BCs for banks or other such institutions or focussed entities which specialises in a specific product to enhance customer experience.

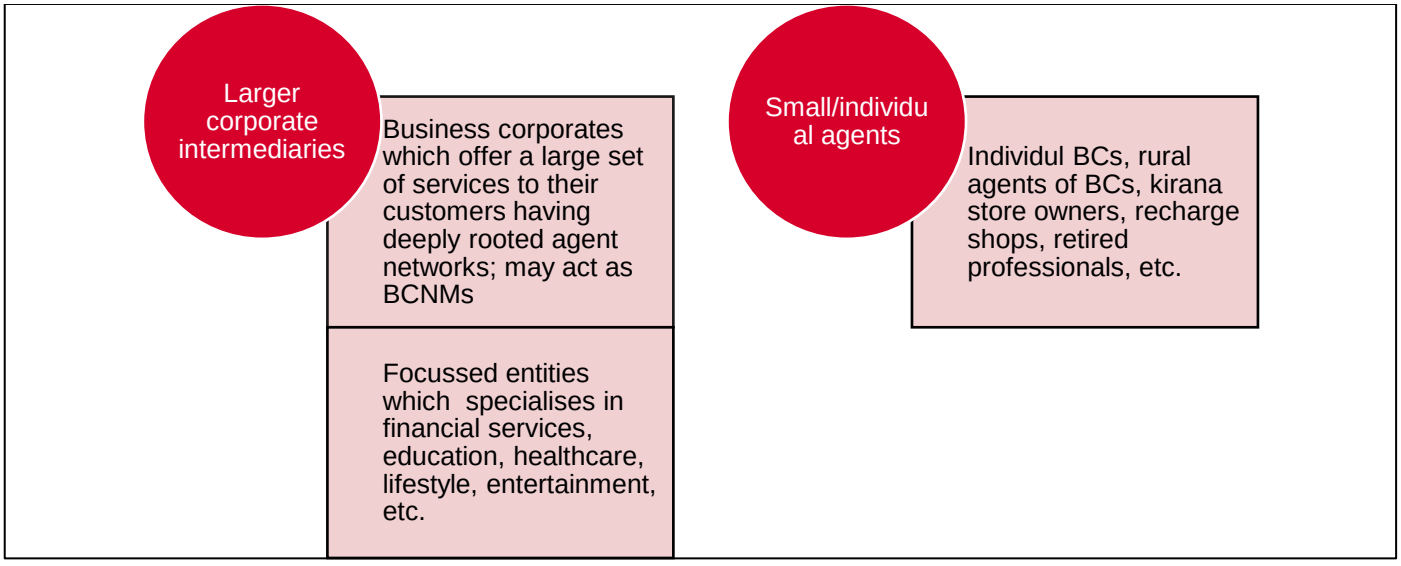
Banking agents deployed by network managers have diverse business models, cost structures and revenue drivers, agent typology, products, and processes.

Different operational models of BC-based banking

Models	Types of agents	Characteristics
Traditional Business Correspondent Network Managers (BCNMs)	Kiosk based, dedicated and more prevalent in rural areas	Partner with multiple banks May have their own technology platform or ride on bank's technology Train BC agents to offer complex financial services

New age BCNMs	Existing merchants, non-dedicated, more prevalent in urban areas	Narrow product focus particularly technology enabled products like AePS and UPIs Typically have their own technology that can be integrated with bank's technology Agents are better suited to tackle simple financial services
Payment banks	Existing merchants, non-dedicated, more prevalent in urban areas or rural marketplaces	Directly manage BC networks and have regulatory permissions to offer financial products other than credit Agents typically are those related through their primary business
State Rural Livelihood Missions (SRLM)	Existing women's self-help groups members (SHG), mostly dedicated and in rural areas	SRLMs in partnership with banks and other BCNMs deploy SHG members as BC agents offering similar products as traditional BCNMs Offer training and one-time grants to SHG members to cover set-up cost

Types of intermediaries which provide services to the large underserved market



Source: CRISIL MI&A Research

3.9 Key players in Business Correspondents industry

Name of the players	Services provided by players
CSC E-Governance Services India Limited	E-Governance services and banking services, etc.
Vakrangee Limited	Banking, insurance and ATM services, E-commerce and logistics services, etc.
Nearby Technologies Private Limited	Banking insurance and micro-ATM services, Travel services, PAN card and tax filing services, etc.
Integra Microsystems Limited	Banking and payment system, Agent assisted services, e-governance, Biometric enabler services, other technology services
RBL Finserve Private Limited	Pan India
New Opportunity Consultancy Private Limited	BC to various banks and NBFCs and provide microfinance loan, MSME loans, Savings account, etc.
Eko India Private Limited	Banking and insurance services, other development of API services
NICT Technologies Private Limited	Banking services, E-Governance services, Ticketing services, RFID services, etc.
Zero Mass Private Limited (a subsidiary of BLS E-services Limited)	Banking services, Micro-insurance, etc.
Alankit Private Limited	Banking services, E-Governance services, Registrar and share transfer agent services, Insurance services, etc.
Fino Paytech Private Limited	Banking services, insurance services, hardware solutions, other technology solutions
Instant Pay Technologies	Banking services, insurance services, etc.
Sub-K Impact Solutions	Banking services, Microfinance, E-Governance services (Rajasthan), telemedicine, e-commerce services, etc.
FIA Technology Solutions	Banking services

3.10 Key role played by BCs and VLEs

BCs and VLEs are retail agents engaged by banks for providing banking services at locations other than a bank branch/ATM. Banks are required to take full responsibility for the acts of omission and commission of the BCs that they engage and have, therefore, to ensure thorough due diligence and additional safeguards for minimizing the agency risk. Basically, BCs enable a bank to expand its outreach and offer limited range of banking services at low cost, as setting up a brick-and-mortar branch may not be viable in all cases. BCs, thus, are an integral part of a business strategy for achieving greater financial inclusion.

BCs are permitted to perform a variety of activities which include several banking activities and third-party activities.

Banking activities

Banking activities which can be provided by BCs include saving account opening, cash deposit, cash withdrawal, fund transfer, balance enquiry, mini statement, IMPS, NEFT, request new cheque book, request for SMS alert, launch and track complaints, apply for Rupay debit card, term deposit/recurring deposit opening, loan application, identification of borrowers, collection and preliminary processing of loan applications including verification of primary information/data, creating awareness about savings and other products, education and advice on managing money and debt counselling, promoting, nurturing and monitoring of Self Help Groups/ Joint Liability Groups, post-sanction monitoring, follow-up of recovery.

Third-party product distribution

Apart from banking activities, BCs can also distribute third-party products such as enrolment of PMSBY, enrolment of PMJJBY, enrolment of APY, Bharat bill payment system (BBPS) for payment of utility bills, sale of mutual fund products and other third-party products.

3.11 Evolution of regulatory framework in India

BC participation rises on favorable RBI regulations

The Reserve Bank of India has taken several initiatives over the years for increasing banking outreach and ensuring greater financial inclusion. A significant step in this direction was the issue of RBI guidelines in January 2006 for engagement of Business Correspondents (BCs) by banks for providing banking and financial services. Since then, the regulatory framework for the BC model has been progressively honed to ensure that consumer protection is not compromised while facilitating enhanced outreach of banking services. The relaxation in the regulatory framework was made possible due to the rapid changes in technology –both in terms of Core Banking Solution as also relatively low-cost biometric handheld devices for ensuring authenticity and fraud prevention.

In January 2006, the RBI issued guidelines allowing banks to designate BCs to increase their outreach. Further, in November 2009, the RBI advised banks to draw up a roadmap to establish a presence in every village with a population above 2,000 individuals by March 2012, using BCs and business facilitators, and to reach the remaining villages in a phased manner over 3-5 years.

Initially, only non-governmental organisations and micro-finance institutions (MFIs) set up under the Trust Act or Section 25 companies and post offices were allowed to function as BCs. Later, in the September 2010 circular of RBI, the guidelines were expanded to include individuals, local grocery shops, and even for-profit companies (excluding NBFCs). In fact, even SHG members, called ‘bank sakhis’, were trained to provide a range of financial and non-financial services on behalf of the bank to their communities, as part of the Rural Financial Institutions Programme, a joint NABARD-GIZ programme launched in 2012.

However, it was not until 2014 that non-deposit taking non-banking financial companies (NBFC-NDs) were allowed to work as BCs. This opened the door for NBFC-MFIs to leverage their strong rural penetration and make the model successful, subject to the following conditions:

- There should be no co-mingling of bank funds and the funds of the NBFC-ND appointed as BC
- There should be a specific contractual arrangement between the bank and the NBFC-ND to ensure that all possible conflicts of interest are adequately taken care of
- Banks should ensure that the NBFC-ND does not adopt any restrictive practices such as offering savings or remittance functions solely to its own customers
- Forced bundling of services offered by the NBFC-ND and the bank should also not take place

Further, the distance criteria – that the distance between the place of business of a retail outlet/sub-agent of BC and the respective base branch should ordinarily not exceed 30 km in rural, semi-urban and urban areas respectively, and 5 km in metropolitan centers – was also relaxed in the 2014 circular, thereby giving corporate BCs more flexibility to expand branch networks and reduce costs.

Initially, banks were not allowed to collect any charges from the customers for providing services through BC, close to the location of the customers. Subsequently, banks were allowed in November 2009 to collect reasonable service charges from customers in a transparent manner under a Board-approved policy. Considering the profile of the clientele to whom banking services are being delivered through the BC model, banks were advised to ensure that

the service charges/fees collected from the customer for delivery of banking services through the BC model is not only fair and reasonable but also seen to be so.

As per 2010 regulations, a BC can be a BC for more than one bank, at the point of customer interface, a retail outlet or a sub-agent of a BC shall represent and provide banking services of only one bank. However, in 2012, the RBI decided to permit interoperability at the retail outlets or sub-agents of BCs (i.e. at the point of customer interface), provided the technology available with the bank, which has appointed the BC, supports interoperability, subject to the following conditions:

a) The transactions and authentications at such retail outlets or sub-agents of BCs are carried out on-line;

b) The transactions are carried out on Core Banking Solution (CBS) platform; and

c) The banks follow the standard operating procedures to be advised by the Indian Banks' Association (IBA). However, the BC or its retail outlet or sub-agent at the point of customer interface would continue to represent the bank, which has appointed the BC.

Key features of revised BC model

Applicable to	The scheduled commercial banks including regional rural banks (RRBs) and local area banks (LABs). The banks may formulate a policy for engaging BCs with board approval
Eligible individual/ entities as BC	• Individuals like retired bank employees, retired teachers, retired government employees and ex-servicemen, individual owners of *kirana*/medical/fair price shops, agents of small savings schemes of Government of India/insurance companies, authorised functionaries of well-run SHGs, etc. • NGOs/MFIs set up under Societies/Trust Acts and Sections 25 companies • Cooperative societies registered under Mutually Aided Cooperative Societies Acts • Post offices • Companies registered under the Indian Companies Act, 1956, with large and widespread retail outlets • ND-NBFCs including NBFC-MFIs
Scope of activities may include	• Identification of borrowers • Collection and preliminary processing of loan applications including verification of primary information/data • Creating awareness about savings and other products and education and advice on managing money and debt counseling • Processing and submission of applications to banks • Promoting, nurturing and monitoring of SHGs/joint liability groups/credit groups/others • Post-sanction monitoring • Follow-up for recovery • Disbursal of small value credit • Recovery of principal/collection of interest • Collection of small value deposits • Sale of micro insurance/mutual fund products/pension products/other third party products • Receipt and delivery of small value remittances/other payment instruments.
KYC norms	Ensuring compliance with KYC norms under the BC model is the responsibility of banks

Payment of commission/fee	The banks may pay reasonable commission/fee to the BC, but the BC cannot directly charge a customer any fee for services rendered on behalf of the bank The banks (and not BCs) are permitted to collect reasonable service charges from customers in a transparent manner

Source: RBI, CRISIL MI&A Research

3.12 Social impact of BCs

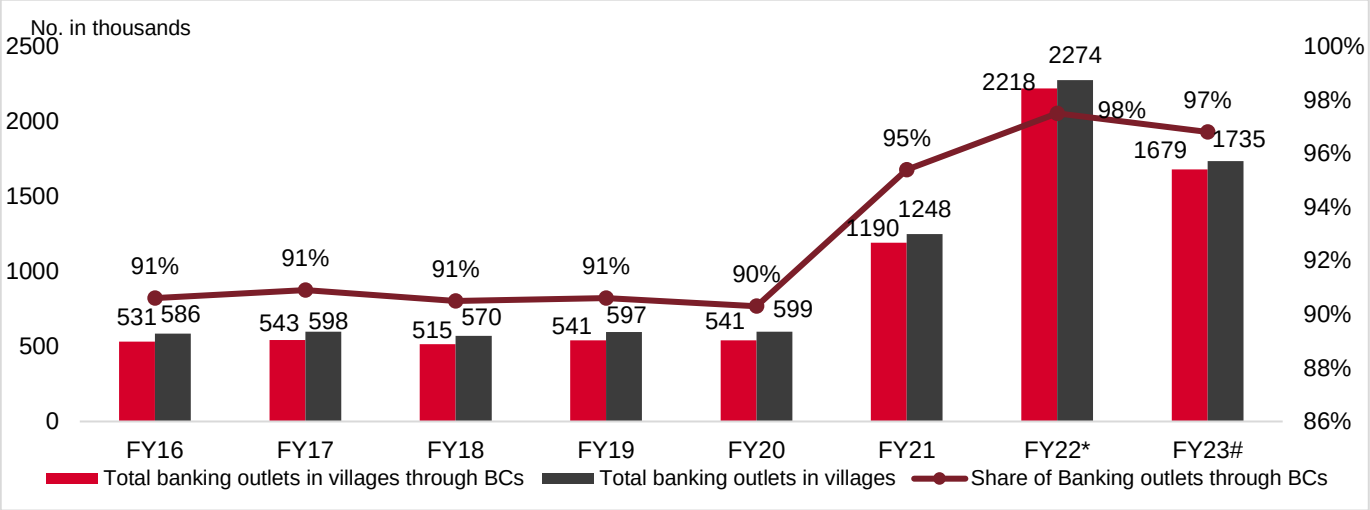
Business correspondents is one of the initiatives to increase financial inclusion and provide banking services to financially excluded people in all parts of the country, especially in the rural areas. Corporate business correspondents use intermediaries such as NGOs, cooperatives, agents, Panchayats, Shopkeepers, etc. for providing financial services. The BC model can be leveraged to change the lives of people in remotest parts of the country. It is being used effectively for community development and social empowerment. BC model is also used by people in remote areas to withdraw all government payments such as DBT payments, pensions, etc. and the model makes sure that the fund reaches to the right person. Ultimately, through BCs, country's economic growth can be shared by all individuals and reduce inequality that exist by bringing more population within the financial fold.

3.13 Business correspondents' network in India

Financial inclusion being the one of the top priorities by the government and the RBI, various steps have been taken by to increase the reach of financial services to the large unserved population of the country to unlock its growth potential. RBI guidelines also state that at least 25% of the total number of banking outlets opened during a financial year should be opened in unbanked rural centres. As per the RBI, a 'Banking Outlet' for a bank is a fixed-point service delivery unit, manned by either bank's staff or its Business Correspondent where services of acceptance of deposits, encashment of cheques/ cash withdrawal or lending of money are provided. As opening of banking branches in rural areas is not operationally viable for banks, banks turn to BCs to provide banking services in rural and semi-urban areas. Therefore, it has gained traction in solving the last mile problem and reaching to the grassroot level at a faster pace and lower cost than traditional brick and mortar branches.

Therefore, the BCs' network in India has grown rapidly in villages in past two years and a greater number of banks have established their presence in villages through BCs. In the last year, total banking outlets in villages through BCs has increased from 1.19 million in FY21 to 2.21 million in FY22. Banking outlets in villages grew at a CAGR of 33% between FY17-FY22. At end of fiscal 2022, almost 98% of banking outlets in villages are through business correspondents.

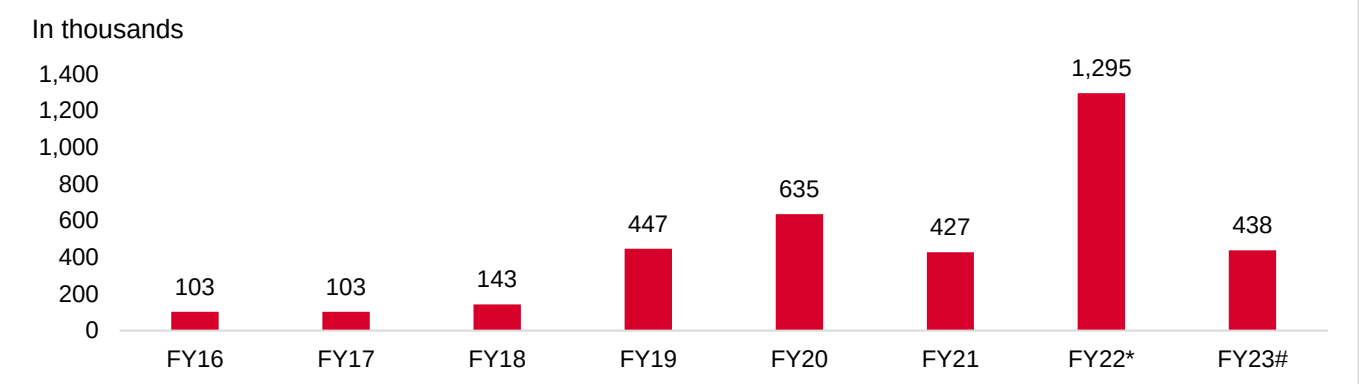
Presence of banking outlets in villages



*Note: *FY22 – provisional data by the RBI, there is a significant increase in data reported by few private sector banks for FY22. #FY23 – Data till December 2022.*

Source: RBI, CRISIL MI&A Research

Urban location covered through BCs



*Note: *FY22 – provisional data by the RBI, there is a significant increase in data reported by few private sector banks for FY22. #FY23 data is till December 2022*

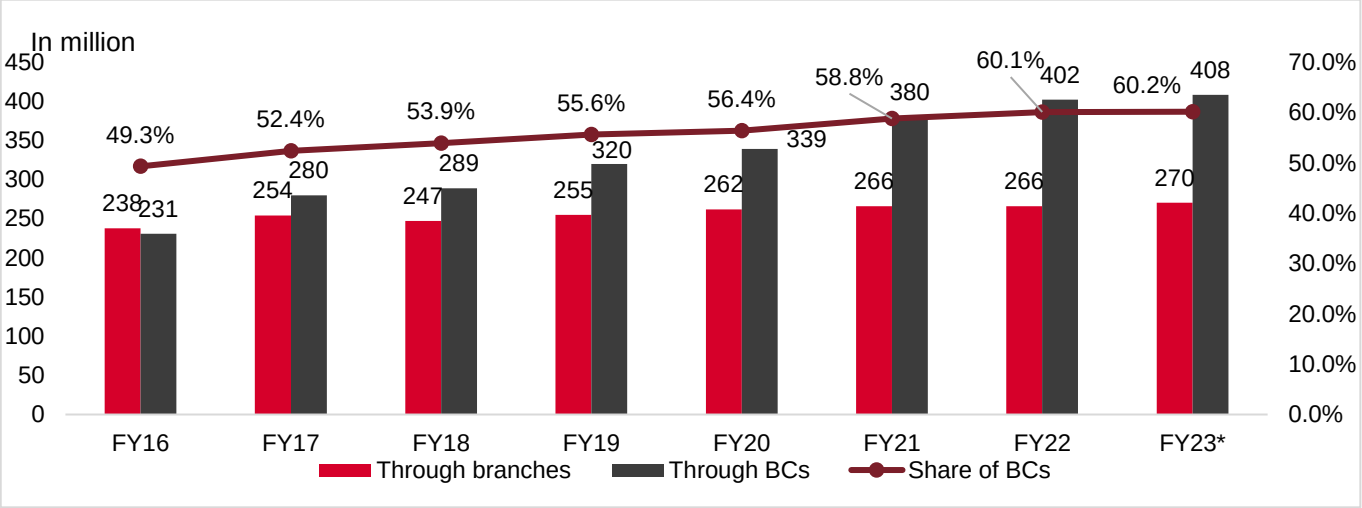
Source: RBI, CRISIL MI&A Research

The state-wise distribution of fixed-point business correspondents (FBCs), however, remains uneven - more than 50% of FBCs located in Uttar Pradesh, Bihar, Maharashtra, West Bengal and Madhya Pradesh. Since March 2018, payments banks have a dominant share in the total number of FBCs, with private banks having a negligible presence.

3.14 Overall transaction volume and value transacted through BCs

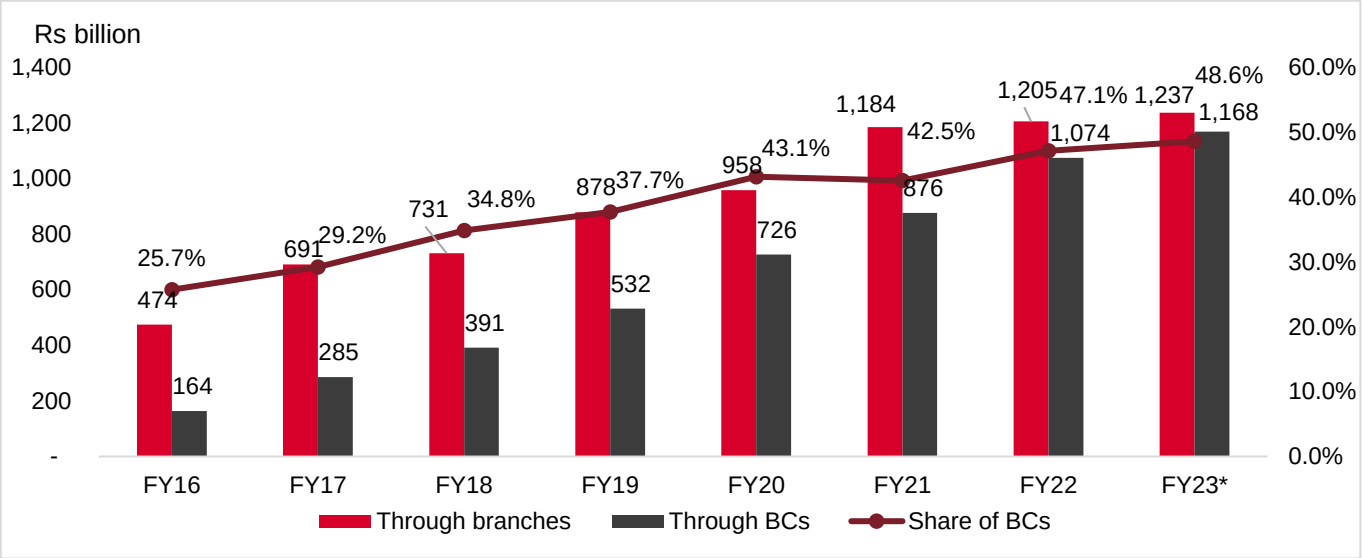
Increase in BSBDA due to PMJDY and increase in DBT amounts and beneficiaries have led to surge in volume of transactions in BSBDA through BCs over the years and registered a CAGR of ~8% between FY17-FY22. The share of BCs in the total number of transactions also increased from 52% in FY17 to 60% in FY22 majorly due to opening of banking outlets through BCs in rural areas and facilitating door-step transactions in remote parts of the country. Similarly, value of transactions in BSBDA through BCs has risen continuously over the years and registered a CAGR of ~30% between FY17-FY22. The share of BCs in the total value of transactions also increased from 29% in FY17 to 47% in FY22.

Number of transactions in BSBDA through BCs increased given lower cost of operations



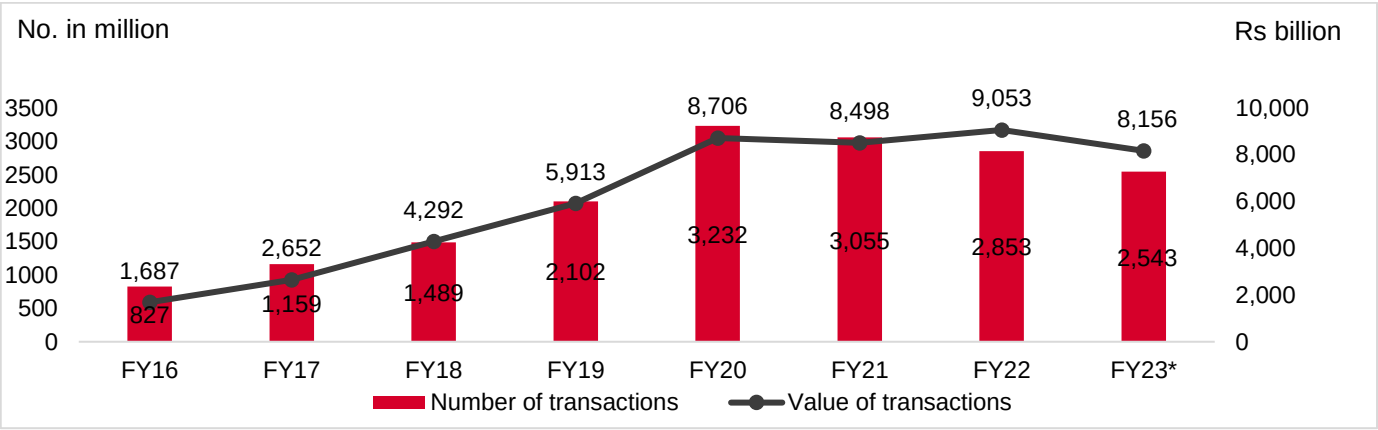
*Note: *FY23 data is till December 2022*
Source: RBI, CRISIL MI&A Research

Amount transacted in BSBDA accounts through BCs increased over the years



*Note: *FY23 data is till December 2022*
Source: RBI, CRISIL MI&A Research

Number of BC-ICT transactions and value of transactions

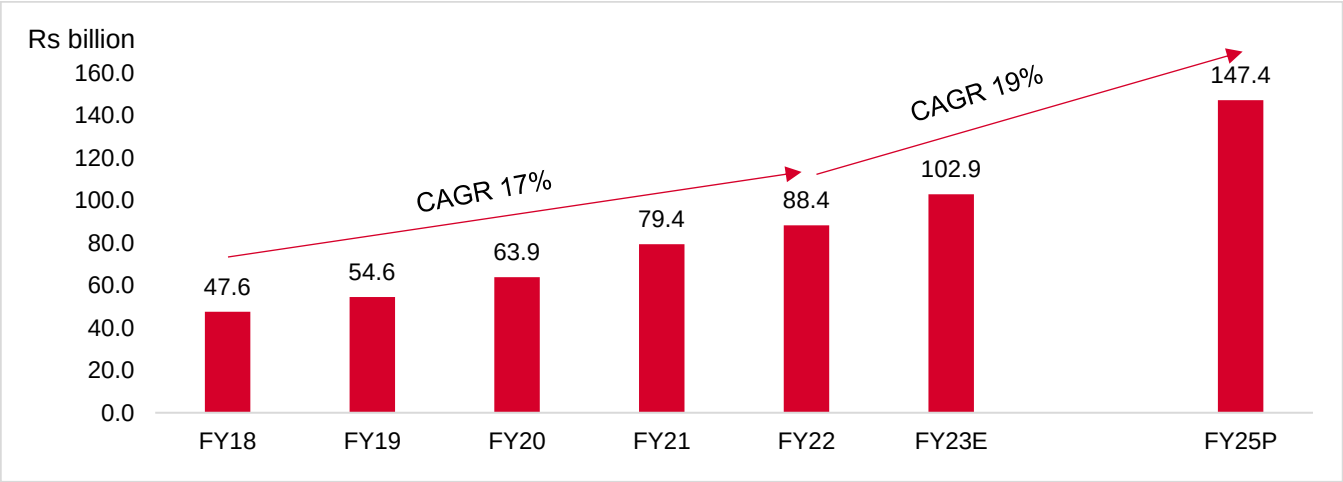


*Note: *FY23 data is till December 2022*
Source: RBI, CRISIL MI&A Research

3.15 Revenue pool of BC business

BCs work on a commission-based model. The commission is paid as a certain percentage of the value transacted or a fixed fee per transaction depending on the agreement. Some of the factors which are expected to drive growth of BC industry size are increasing outreach of BCs in rural areas, increase in BSBDA accounts and deposits, increasing volume and value of transactions through BCs, increasing government's DBT schemes and funds, facilities to make various types of bill payments through BCs, various value-added services provided by BCs such as Aadhaar seeding. Mobile seeding, etc. Additionally, growth in microfinance lending through BCs will increase revenue of BCs.

BC industry size expected to grow at CAGR of ~19% from FY22 to FY25



Note: E = Estimated, P = Projected
Source: CRISIL MI&A Research

3.16 Leveraging technology for BCs

Specialised fintechs

With more and more disruptions taking place in the fintech space, some corporates with technical abilities restrict themselves to specialise in a particular service/set of services. They further delve deeper to offer better services and bring more and more features to enhance the particular service.

These specialized fintechs avoid competition with diversified players and provide niche services with high capability offerings thus restrict to a particular field and take that up as a core offering. Some examples of these core services are ticket booking, hotel booking, insurance marketplaces, etc.

Corporates operating as BCNMs

As against the specialised fintechs, these corporates operate in a diversified universe entailing various capabilities. The specialised entities have smaller networks as against these diversified BCNMs, as agents prefer network managers which offer multiple services where a customer can walk in and perform a variety of transactions not restricted to a particular field of service.

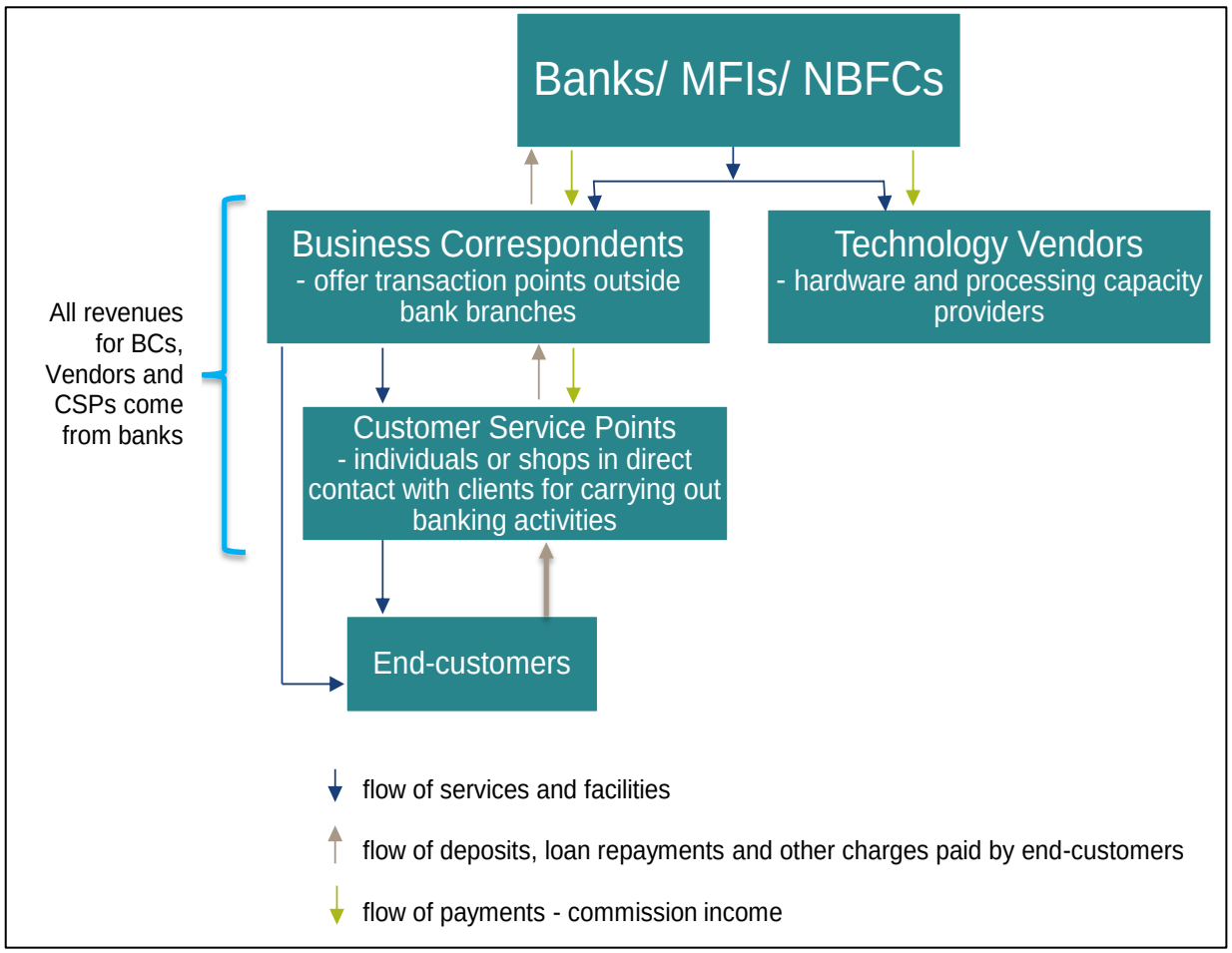
These corporates offer a bouquet of services from bill payments, account opening, cash deposit and withdrawal, shopping, bookings, etc. These are often provided to the population via the network of agents directly managed by the corporate or through the corporate-owned centres providing all the services.

These intermediaries also provide additional services such as PoS machines, educational services, etc. to their agents, if need be, to further enhance the agents capacity to provide the customer with better quality of services. They serve a larger category of the population, may it be a daily wage worker, a migrant, retailer, utility bill payer, etc. All these intermediaries in a way help banks and other financial institutions to increase their footprint among the underserved sections of the population, reducing the infrastructure cost of banks and making them asset light in terms of rural infrastructure. They earn in terms of commission for the services provided and promote the government's policy aims of achieving financial inclusion.

Branchless banking with BCs made possible with technological progress

According to the RBI guidelines, BCs are permitted to carry out financial transactions on behalf of a bank as agents, which is called branchless banking. This model is being aided by technology-oriented tools such as point of service handheld devices, mobile phones, and biometric scanners.

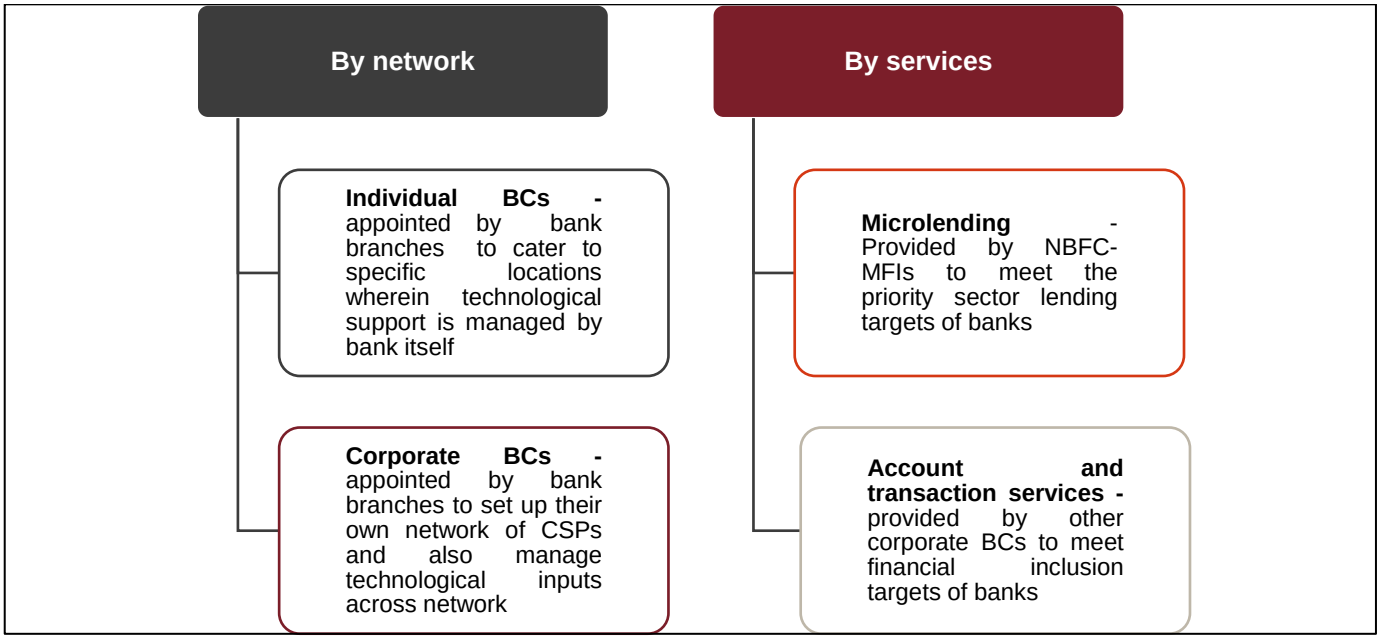
Network flow of BC model



Source: CRISIL MI&A Research

The blend of technology required to make the BC model a success has resulted in several technology vendors expanding as corporate BCs, wherein they not only provide the technology including hardware, software, and support for maintenance, but also employ individual BCs under them to carry out activities on behalf of the bank. Corporate BCs are more integrated, which means less interference and hassle for banks who need not coordinate with multiple entities to make the model work. Several corporate BCs have rolled out schemes for individuals to open customer service points (CSPs) with their support and make a living.

Different kinds of BC models



Source: CRISIL MI&A Research

Expanding through BCs to meet twin objectives of financial inclusion and priority sector lending

The NBFC-MFI portfolio has increased substantially as they are now eligible to act as BCs. Leveraging their existing rural network, NBFC-MFIs act as channels for banks to meet the latter's priority sector lending targets. With numerous technology firms such as Suvidhaa, Oxigen, Zero, Ekagon, and Eko also acting as corporate BCs, the number of bank accounts and associated banking transactions are increasing in otherwise unbanked locations. This has helped in providing banking facilities in locations having no bank branches within a 4-5 km radius.

Sustainability and outlook: BCs are here to stay

Banks have understood that opening and maintaining an account with a branch for marginal customers with small float in their accounts is far more expensive than enabling BCs to open and maintain such accounts. They have also recognised the role BCs can play as an alternative channel to service existing marginal and low net worth bank customers.

Banks have started to play an important role in enhancing the legitimacy of BCs as their new distribution and service channels. Leading banks have geared up their marketing efforts by prominently displaying signage, tariff cards and service information at CSP locations. Local branch managers and staff are now more aware about BC activities and have been assigned mandates to monitor the performance of agents linked to their branches, to provide necessary operational support, and address their issues.

Better usage of technology, coupled with the government's financial literacy initiatives, has led to wider coverage by BCs and reduced the effort required to open additional accounts and process transactions. Hence, several individual BCs are able to manage multiple CSPs with improved efficiency. The involvement of locals, especially members of panchayats and SHG heads, has further enhanced efficiency. With this kind of growth, coverage through BCs has improved not only in rural areas, but also in urban areas.

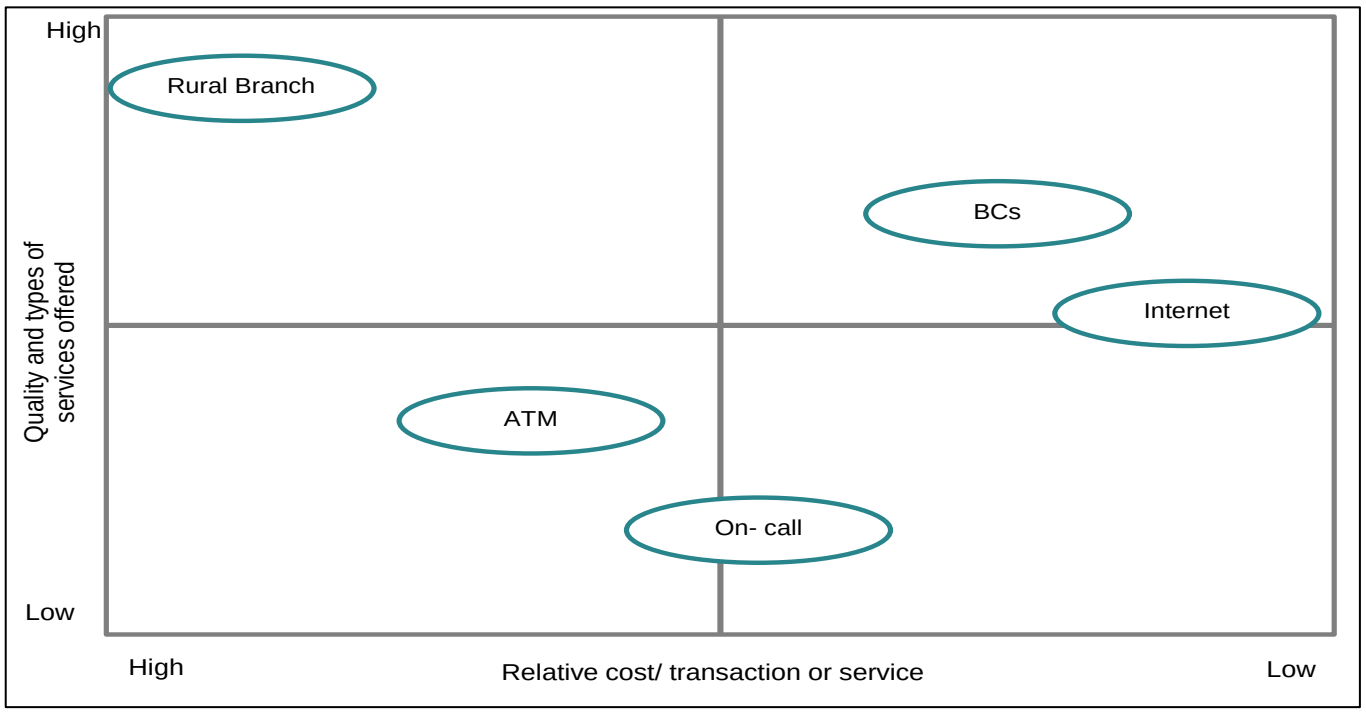
3.17 Growth drivers for BC business

Model is sustainable with reduction of operating expenses of rural branches

Rural customers will be profitably served only with low-cost business models having low break-even ticket size. Over the past five years, banks increasingly outsourced their operations in rural areas to BCs, ensuring relatively lower costs vis-a-vis bank branches. Going forward, we expect banks to increasingly experiment with different low-cost business models, smaller cost-effective branches and new uses of technology to serve this segment profitably.

In fact, the cost of internet banking is the lowest as it is free of direct human involvement but has its own limitations. Poor internet connectivity, lack of technological know-how, poor smartphone penetration due to low affordability, and transactional limitations to non-cash transactions have put internet banking as a means to financial inclusion on the back foot. On the other hand, BCs with the blend of technology and human involvement through CSPs provide branch services like deposits, account openings, withdrawals, credit collection etc. at a very low operational cost.

Comparison of various media of bank services by operating cost



Note: 1. ATM cost is based on the typical cost charged to the bank on a per transaction basis by a fully outsourced ATM service provider; 2. Call centre cost is based on per seat cost of Rs 30,000/ month; 3. BC cost and bank branch cost is based on CRISIL estimates as well as interactions with bank branches and BCs conducted by CRISIL MI&A Research; 4. Internet/mobile cost is only based on transaction done by customers itself. A large part of RTGS and NEFT transactions are done in bank branches, the cost for which is very high as compared to the cost given above. We have not included NEFT/RTGS transactions done in the branches.

Source: CRISIL Research, RBI, Industry

BCs help to reduce banks' operating costs

- Setting up the bank branch in rural area would involve high investment as compared to having banking outlets through BCs, increased usage of BCs particularly in rural areas will help lower the expenses of banks
- Increased outsourcing to BCs and growing fund flow in the form of government subsidies will result in an increase in the number of transactions per outlet while average ticket size per transaction would also grow
- A rural customer requires guidance for which he would prefer to go to a BC or a bank branch and therefore, usage of internet banking will be lower in rural areas

3.18 Key success factors and risks in BC business

Key success factors

Local BC agents to connect with community: Awareness of the local market and community help BCs connect with people more easily. When CSPs are from local communities, it gives them better access, making it easy to establish trust and ensuring the sustainability of the model.

Increase overall product offerings: Availability of a wide range of products will offer BCs greater avenues to increase client penetration and stickiness.

Covering female population with doorstep banking: With a strong focus on targeting women entrepreneurs, BCs should effectively walk that extra mile to cover all those women who run small businesses from their homes and are hesitant to leave the confines of their houses to avail of banking facilities.

Building trust and improve persuasion skills: BCs should try to help financially illiterate and unaware customers understand the need to shift from informal to formal sources of finance.

Ability to use technology as a benefit: Many BCs are unaware about the nuances of technologies used to smoothly run the BC business. Hence, ample training and basic literacy is needed so that BCs get comfortable with technology-driven processes using point-of-sale devices and laptops.

Motivate rural youth to be a part of change: People who are more aware about the locality connect well with the people. Hence, BCs should be role models for rural youth to improve learning and earn additional income, so that lack of manpower does not become a hindrance to the BC business and financial inclusion.

With low levels of financial inclusion and various efforts of the government to set up parallel infrastructure institutions, the underserved population has attracted attention from intermediaries owing to the market potential on offer. To boot, the rise in technology backed entities have further helped in serving this category of population. Thus, with combined efforts, the households which were traditionally underserved are finding better alternatives for their financial needs than before.

Key risks in the BC business

High-cost cash-handling operations: The BC business is heavily dependent on cash transactions. About 99% of the financial transactions are in cash, which increases the operational risks.

Stringent regulatory norms: BCs operate mostly in rural areas with accessibility issues, even though, as per the RBI guidelines, they have to complete accounting and settle cash with bank branches within 24 hours of each transaction. These kinds of strict norms pose a challenge to the business and create hassles, especially in areas where connectivity poses a hurdle.

Technical challenges: The BC business relies heavily on mobile network operators, as most functions involve connectivity with servers to process transactions or other related operations. The major risks involved are high internet costs, limited availability of data services in rural areas, and untrained manpower to use technology efficiently.

Reputation risk: BCAs could unknowingly provide ambiguous information to customers which leads to reputation risk for both corporate BCs and Banks. Also, any frauds at agents' end will impact the relation of corporate BCs with partner bank.

4 Domestic Remittances

4.1 Overall Market Size

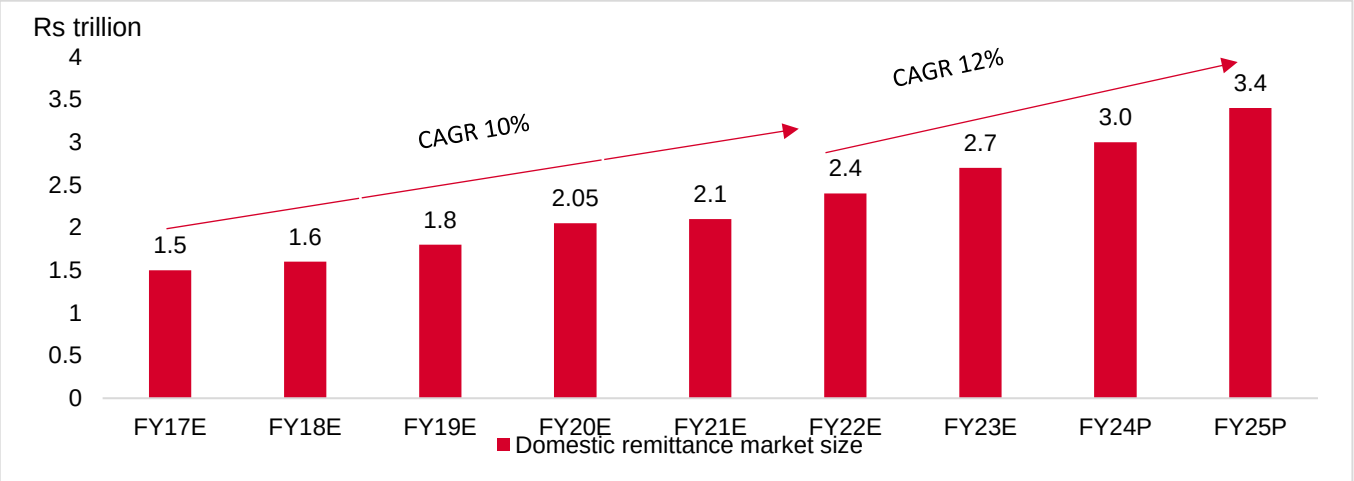
Domestic remittance transfers predominantly refer to migrant workers sending money from the places where they work to their homes in other states/regions for meeting the needs and day-to-day expenses of their family members.

As the urban population in India has consistently been increasing, we are witnessing an increasing trend of migration from villages and smaller semi-urban areas to larger cities and towns. As per the census 2011 data, India had 456 million migrants (38% of the total population) as compared to 307 million migrants (30% of the total population) in 2001. The number of migrants who moved from rural to urban areas also increased from 52 million in 2001 to 78 million in 2011, leading to a rise in share of rural to urban migrant in the population from 5.1% in 2001 to 6.5% in 2011. The number of migrants in the total population is expected to have further increased over the last decade, leading to strong growth in the domestic remittances market. While recent data on the number of migrants in India is not available, the Economic Survey 2021 notes that 6.31 million migrant workers travelled to their hometowns through Shramik Special trains from May to August 2020 after the onset of the Covid-19 pandemic and nation-wide lockdown.

CRISIL MI&A Research estimates the total domestic remittances market to be just a shade over Rs 2.4 trillion in fiscal 2022. Between fiscal 2017 and 2022, this trend in migration of population has continued, leading to an 10% CAGR growth in the domestic remittance market.

Going forward, CRISIL MI&A Research expects remittances to gradually increase as the economic situation comes back to normal in fiscal 2023. In the long term, digital India and financial inclusion initiatives in the country is expected to support remittances growth, with more and more people availing remittance services for funds transfers to remote areas. We project the market to touch Rs 3.4 trillion by FY25, translating into a ~12-13% CAGR in remittances during FY22-25.

Domestic remittance market to grow at a 12-13% CAGR between fiscal 2022 and fiscal 2025



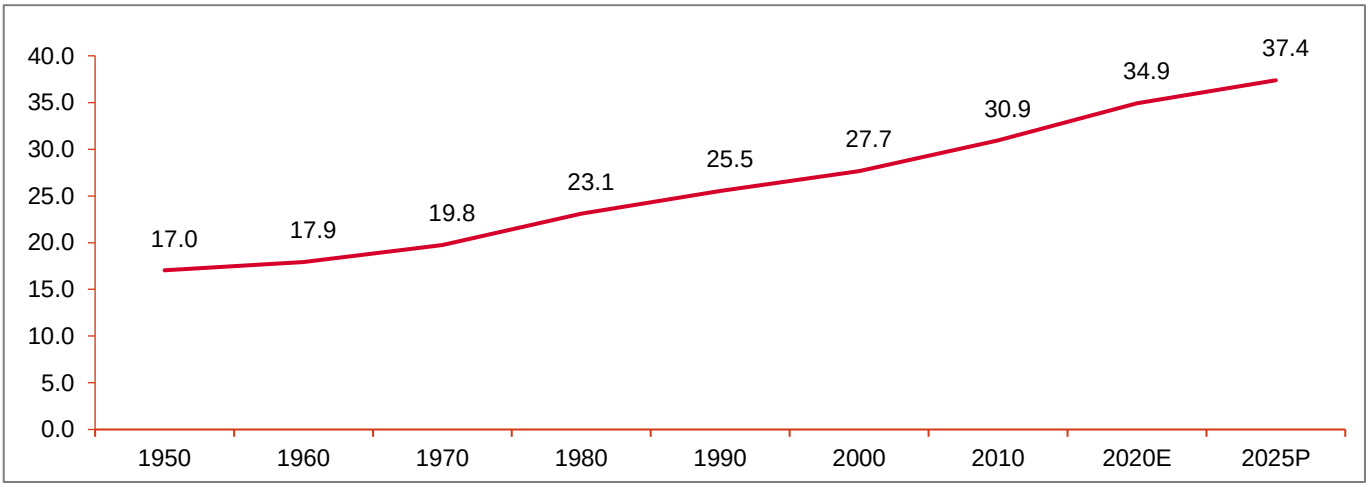
Note: E: Estimated, P: Projected
Source: Economic Survey 2017, CRISIL MI&A Research

4.2 Growth drivers

Urbanisation and migration of population to urban regions to drive growth

Urbanisation is one of India's most important economic growth drivers as it will drive substantial investments in the country, which, in turn, is expected to lead to job creation, development of modern consumer services and increased ability to mobilise savings. The country's urban population has been rising consistently over the decades. In 1950, it was 17% of total population. As per the 2018 revision of World Urbanization prospects, the proportion of urban population in India was estimated at 34% as of 2020. This is expected to reach 37% by 2025, which will drive growth in the domestic remittances market in the times to come.

Urban population as a percentage of total population (%)



Note: E - Estimated, P - Projected

Source: Census 2011, World Urbanization Prospects: The 2018 Revision (UN)

Revival of economy to aid remittances

Improvement in activities such as infrastructure and real estate development will see labourers returning back to city to take up their jobs. This is expected to result in a rebound in remittance services in the medium term.

Improvement in financial system infrastructure to drive remittances

According to the G20 National Remittance Plans of 2019, India is committed to increase remittances market competitiveness, improve financial infrastructure and pursue policies to reduce remittance rates. Thus, the government is expected to continue to focus towards deepening of financial infrastructure in the remote parts of the countries through product innovation and harnessing of new technologies. This will enhance the outreach of payments systems including remittances service, through active participation and co-operation with regional players for establishing standard protocols for larger systemic benefit. For example, within a short span of time, we have witnessed UPI becoming a very popular payment system, across platforms and applications due to strong government focus, increase in use cases, and the convenience offered.

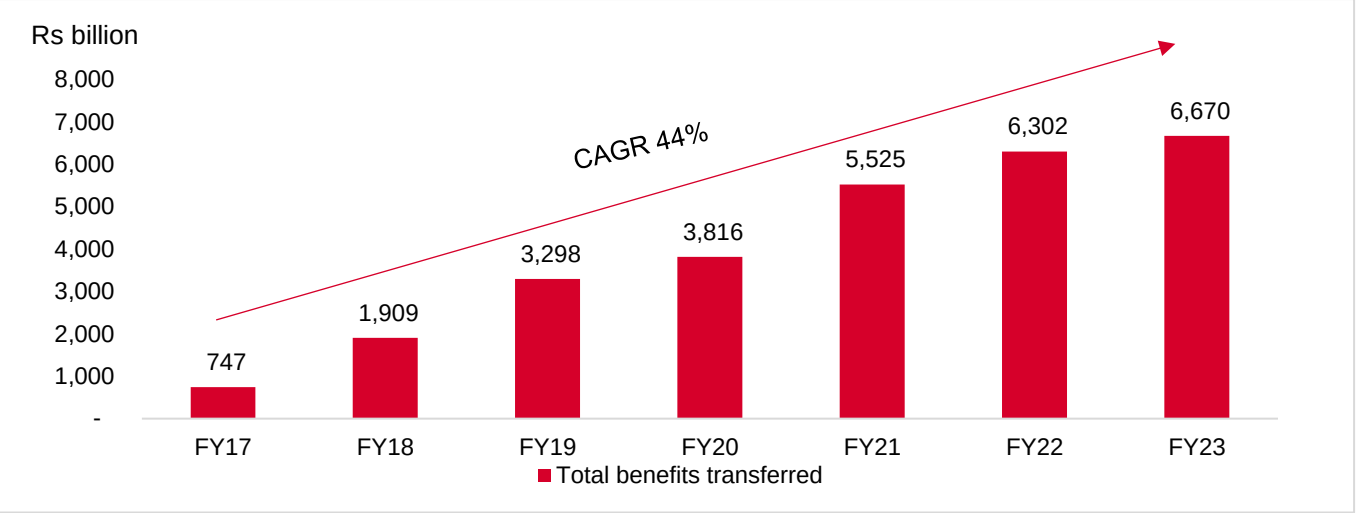
Emphasis on Direct benefit transfer (DBT) by the government

The transfer of government subsidies and payments directly into the bank accounts of beneficiaries has helped cut out middlemen and enable better targeting of subsidies. The DBT scheme has achieved greater effectiveness with the help of Jan Dhan accounts. The government is targeting to bring all government schemes gradually under the

ambit of DBT, which will cut leakages and improve the transparency in the system. Customers availing of government subsidies, on their part, will be required to avail of remittance services to withdraw funds deposited into their accounts instead of relying on unorganised middlemen.

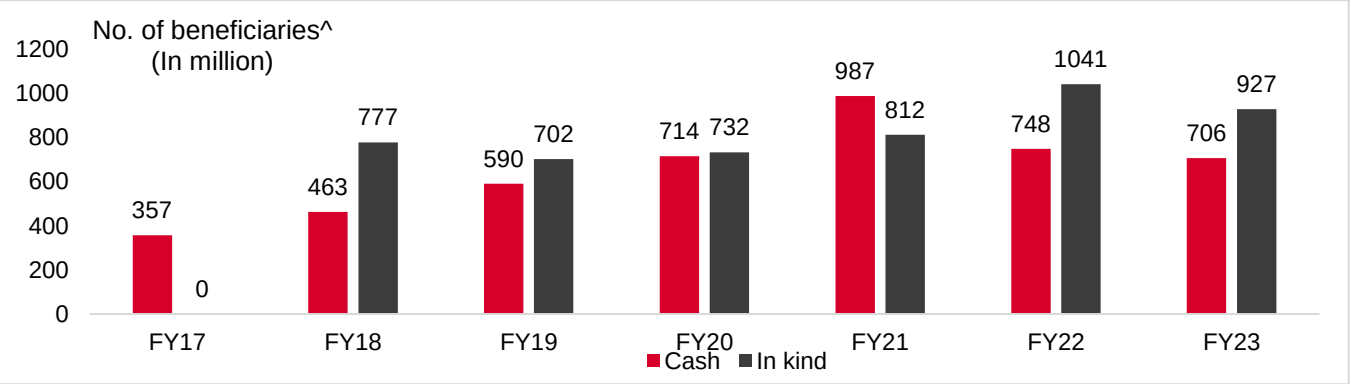
During pandemic, DBT emerged as a boon in providing succour and relief to millions of citizens whose livelihood was impacted. Cash amounts were transferred using the digital payments technology vehicle under Central Schemes (CS) and Centrally Sponsored Schemes (CSS) like PM-KISAN, Mahatma Gandhi National Employment Guarantee Scheme (MGNREGS), National Social Assistance Program (NSAP), Prime Minister's Matru Vandana Yojana (PMMVY), National Rural Livelihood Mission (NRLM), National Health Mission (NHM), scholarship schemes of various ministries through the National Scholarship Portal (NSP). In addition, states like UP, Bihar, Madhya Pradesh, Tripura, Maharashtra, Jammu & Kashmir, Andhra Pradesh also leveraged on the DBT platform and therefore, a sudden jump in DBT amount and number of beneficiaries can be seen in FY21.

Total direct benefits transfer by the government grew at CAGR of 44% between fiscal 2017 and fiscal 2023



Source: DBT Bharat, CRISIL MI&A Research

Direct benefits transfer (DBT) beneficiaries



Note: ^Sum total of beneficiaries across schemes

Source: DBT Bharat, CRISIL MI&A Research

Growing BC penetration and emergence of newer channels for remittance

The channels use for remittance vary largely as companies use channels like NEFT, IMPS, RTGS, PPIs and new modes of payments like NPCI's enabled Aadhaar enabled payment system (AePS). Much of the domestic remittance in India currently happens through agents or touchpoints who acts as business correspondent (BCs) for banks and provide a range of basic banking services. As more and more payment based fintechs are entering the industry, digital wallets are increasingly becoming popular for P2P transactions. Compared to traditional methods, they're also faster, cheaper and convenient. Sending money from one digital wallet to another account is instantaneous, wherein the sender just requires the phone number of the recipient. The recipient can link the mobile wallet for credit directly into the bank account or cash out the remittance at any other convenient time.

4.3 Revenue model of service providers in the remittance business

The market for domestic remittance was once dominated by India Post and a multitude of informal service providers. However, over the past decade, the banks have developed various models to provide remittance services and acquire a larger share of this market opportunity. Domestic money remittance (DMR) enables a walk-in customer to transfer funds to any bank account, anywhere in the country. The customer just has to deposit the amount to be transferred to the DMR agent or the agent at the banking touchpoint, who would then transfer the amount using NEFT or IMPS to the beneficiary. Most of the costs associated with the remittance is towards API usage and commission paid to the agents who facilitate the transactions. The customer can also choose to remit funds directly through the mobile based platform using the phone number of the beneficiary.

The revenue source for the DMR providers is primarily dependent on the volume of transaction. They earn a fee, which is paid by the sender. The domestic remittance charges are set as an absolute amount, which varies across different slabs of amount transferred. Overall, as a proportion of the amount remitted, the charges vary between 0.5%-1.0% of the fund transferred. The scale of operations of the DMR providers, availability of touchpoints, trust and convenience offered to the customer also forms a critical part of the remittance business.

Commission Structure on Different services offered by Banks	Commission to corporate BCs 2022
Account opening	Rs. 15-20
Opening of FD/RD	Rs. 10-15
Cash deposit	Rs. 2-15
Cash Withdrawal	Rs. 3-22
Remittance Cash	Min. 0.25%, Min Rs 2, Max Rs 100
Remittance transfer	1.0%, Min Rs 3, Max Rs 17
IMPS Cash	Min Rs 4 Max Rs 50
IMPS transfer	Min Rs 2.5, Max Rs 60
Loan Processing	10% of the processing fee on the sanctioned amount (Processing fee - 1-2% of the Sanctioned amount)
Repayment to A/C	Rs. 5-8
Commission on recovery of NPA	10% of collected amount
Life Insurance	7-8% of the premiums
Bill Payment	Rs 4-12
Aadhaar seeding/Mobile seeding	Rs. 5

AePS cash withdrawal	Min Rs. 0.25 and Max. Rs. 10
Weekly average balance maintenance fee (each CSP) with some conditions	~1% per annum for average balance > Rs. 2000 subject to conditions

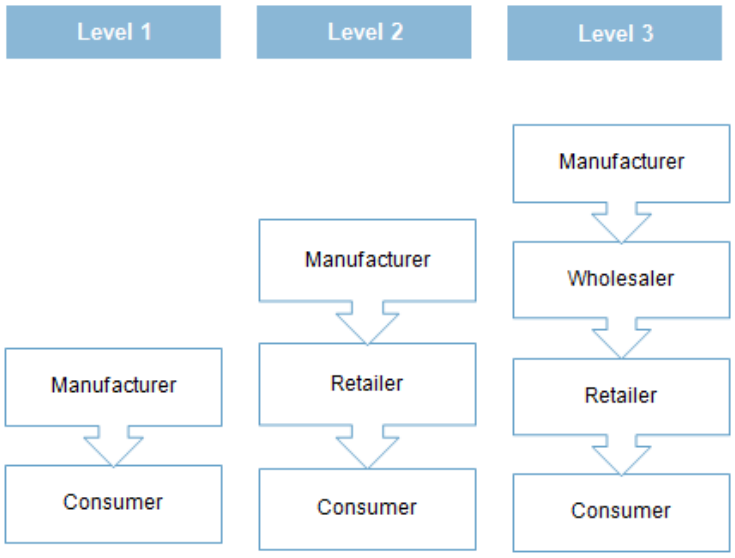
Note: Above are average charges are as per Market Interactions, The, charges vary from banks to banks and BCs to BCs.
Source: Company websites, CRISIL MI&A Research

5 Retail cash management services in India

5.1 Retail industry in India

Retailing is a distribution channel through which goods are sold in small quantities to the final consumer. A retailer is typically a reseller, who buys products from a manufacturer/supplier/distributor and sells them to customers, without altering characteristics of the product significantly. Generally, retailers are at the end of the distribution channel. However, a manufacturer may also be a retailer if he sells products directly to customers.

Retail distribution channels



Source: CRISIL MI&A Research

Retail sector to continue uptrend in fiscal 2023

With the Indian economy caught in crosswinds, gross domestic product (GDP) grew at a slower pace of 4.2% in fiscal 2020. In cautious spending scenario, discretionary segments such as gems & jewellery and apparel were impacted the most while the impact was lower on non-discretionary segments such as food & grocery and pharmacy. Thus, overall retail grew at a slower pace of 9% in fiscal 2020.

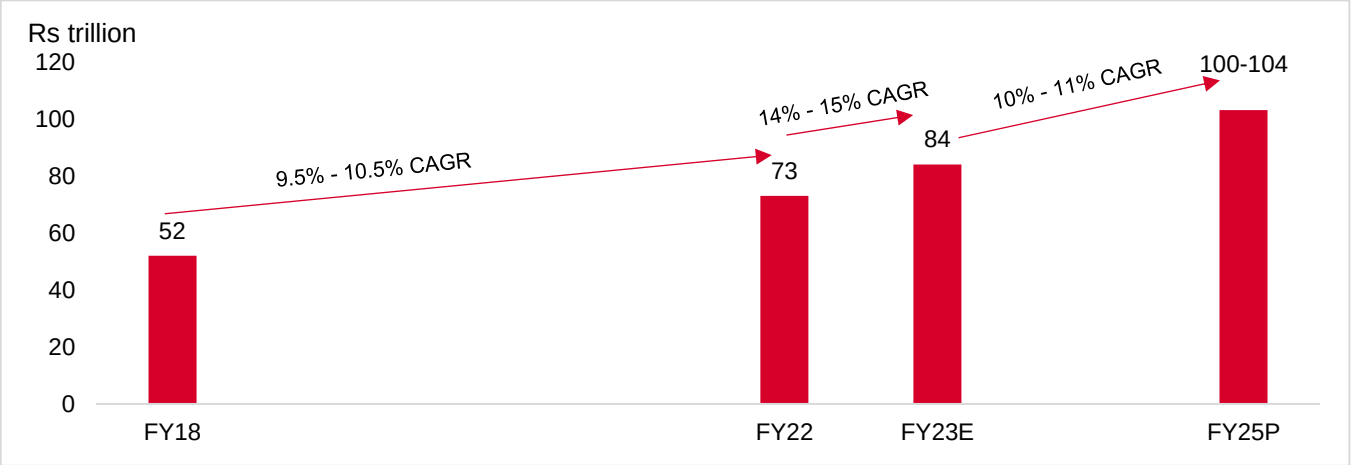
Retail sector declined in fiscal 2021 in line with decline in GDP and PFCE. With implementation of nationwide lockdown on account of Covid-19, retail consumption took a hit. However, the impact can be divided into two- on essential and non-essential goods. Non-essential goods saw the burnt as ban was put on its sale, thus Q1 was worst hit. Sale of essentials was allowed and thus it witnessed growth. Essential products (especially food & grocery) witnessed normal growth. However, non-essential witnessed slow recovery even during second half of the fiscal on account of impact on incomes due to pandemic. As essentials (food & grocery and pharmacy) form around 57% of overall retail which witnessed growth of ~10%, the decline of overall retail was restricted to 2%.

The retail sector witnessed ~18% growth in fiscal 2022 on account of a low base, higher discretionary spending and waning impact of the pandemic. With lockdown imposed in various states owing to Covid-19, consumer confidence was affected in the first quarter of fiscal 2022. This restricted further growth.

With resumption of services activity in fiscal 2023, contact-intensive services, which still trail the pre-pandemic levels of fiscal 2020, started contributing favourably to growth. Retail is estimated to continue uptrend and grow by 14-15% in fiscal 2023. Eased restrictions, opening of offices and improving consumer sentiments will drive this growth.

Between fiscal 2023 and fiscal 2025 CRISIL MI&A Research believes growth will accelerate at a 10-11% CAGR, as economic activity picks up and inflation remains in low to moderate range. Consumption revival coupled with economic growth will boost consumer sentiment and drive up discretionary spends. Improved investment by the large retailers will further propel retail growth.

Retail market size in India



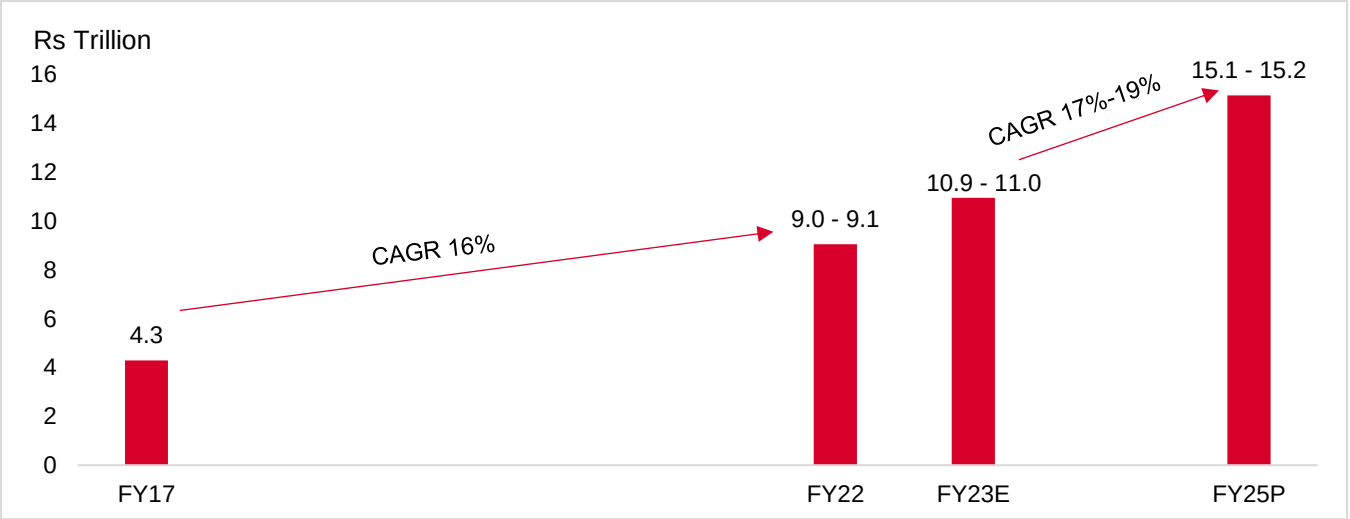
Note: E: Estimated; P: projected
Source: CRISIL MI&A Research

Organized retail market is expected to cross Rs 15 trillion by FY25

While organised retail penetration (comprising both organised brick and mortar stores as well as retail spending on e-commerce platforms) in India is increasing at a feverish pace, for large swathes of the Indian population, particularly lower middle-class customers and customers in the semi urban and rural areas, small mom and pop stores remain the primary outlet for retail spending.

New store rollouts as well as increasing penetration into tier-II & III cities apart from metros and tier-I will propel growth in longer term. Government's decision to permit 100% foreign direct investment (FDI) in single-brand retail under the automatic route from 49% earlier and relaxation in sourcing norms will boost growth in the longer term. Further, with pick-up in macro and improved consumer spending in the longer term, organised retail will see healthy growth. Organised retail is expected to clock 17-19% CAGR over fiscals 2023 to 2025, crossing Rs 15 trillion.

Organized retail market is expected to cross Rs 15 trillion by FY25



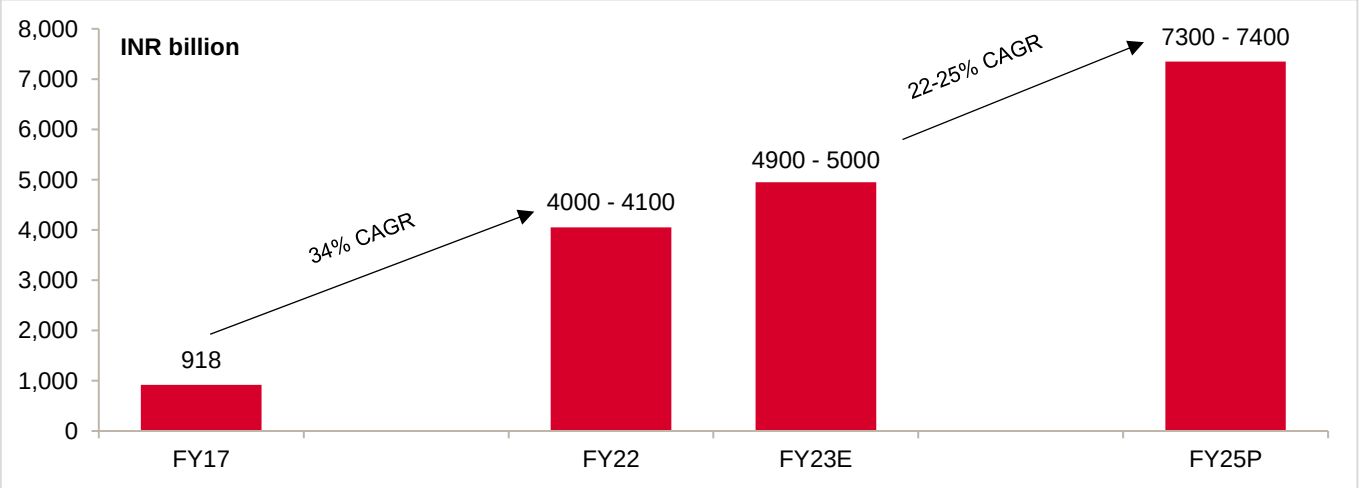
Note: P-Projected, E: Estimated
Source: *CRISIL MI&A Research*

5.2 E-retail to clock CAGR of ~22% - 25% in the medium term

CRISIL MI&A Research projects the Indian e-retail sector to clock 22%-25% CAGR between fiscals 2023 and 2025. Consumption slowdown and ban on sale of non-essentials following second wave impacted demand in the first quarter of fiscal 2022. CRISIL MI&A Research expects demand to bounce back and the sector to be poised for growth in the medium term.

Online grocery, which has caught the attention of all major players and has seen significant investment over past few years, will be fastest-growing segment. Apart from this, continued focus of major players on existing business segment such as electronics will drive growth. With omni-channel strategy gaining prominence, the e-retail industry seems set to add to the growth of the overall organised retailing sector rather than pose competition to existing players.

E-retail growth forecast through fiscal 2025



Note: P: Projected; our definition of e-retail includes products sold via online retail and online marketplace business models,
Source: CRISIL MI&A Research

Consumer electronics considered for e-tailing comprises mobiles and accessories, personal computers, household appliances and small electronics. The segment forms large portion of the e-tail pie. Of the overall consumer electronics e-tail sales, mobile phones account for higher share. Wider choices, competitive pricing, easy delivery owing to small size, exclusive online sales by some brands, and flash sales have propelled mobile phone growth on the online platform. However, even in the online-mobiles market, the share of relatively low-value products is significantly higher. Sales through online platforms will grow at a slower pace compared with the past three years. Earlier, growth was because of lower base and demand generated by first-time urban users for lower-range mobile phones. Higher-range smartphones will start taking precedence, and, thus, with a shift towards high-value purchases, people would like to see and touch products before buying. Online grocery has seen significant investment from major players over past few years. Apart from this, continued focus of major players on existing business segment such as electronics will drive growth.

Several big e-commerce players are yet to reach all areas of the country and may need to partner with the companies which provide e-commerce assisted services.

Major players looking to tap opportunity in the online segment

New entrants	Description
Starquik	This is omnichannel foray by the Tata Group
Reliance Jio	Has started JioMart to sell groceries online
D-Mart	The company is also offering groceries online through DMart Ready
Flipkart	Flipkart did a soft launch of online grocery delivery service Supermart in Bengaluru
Tata Digital	Has acquired online pharmacy 1MG
Nykaa	Has acquired online jewellery brand Pipa Bella
Reliance Retail	Has acquired online furniture retailer Urban Ladder

Source: CRISIL MI&A Research

Increasing participation and lucrative offers set the pace for whopping growth in e-retail

The launch of Flipkart.com in 2007 provided a much-needed fillip to the Indian e-retail industry, comprising both inventory and marketplace models of operations. Snapdeal switched to a marketplace model in 2012 from being just a deals website in 2010, and global e-retail giant Amazon commenced its Indian operations in 2013. Moreover, the industry was flushed with early-stage and venture capital funding that led to growing e-commerce penetration in different retail product segments. Apart from primary growth drivers, such as increasing internet penetration, higher disposable incomes, and rising urbanisation, user-friendly interfaces of portals, ease of shopping, increasing awareness, relatively high pricing discounts (in comparison with brick-and-mortar stores), and easy delivery and innovation have propelled growth.

The cash crunch after demonetisation dealt a big blow to the cash-on-delivery (CoD) business. The slowdown in funding in fiscal 2017 compounded woes, leading to slower growth in fiscal 2017. The introduction of goods and

services tax (GST), confusion around its implementation and teething troubles in its usage system affected sales in the first half of fiscal 2018. However, with frenzy over GST settling and consumer sentiment improving, growth rebounded and have clocked 35% year-on-year in fiscal 2018.

Investments by major e-retailers, discounts, advertising, and supply-chain expansion helped demand grow in fiscal 2019, too. Festive season saw bumper demand on account of heavy discounts, easy payment options, and swift delivery. Growth was affected in the last two months of fiscal 2019 with changes in government regulations. Thus, the industry is estimated to have grown ~33% in fiscal 2019.

The Department of Industrial Policy & Promotion's recent clarification on foreign direct investment (FDI) policy by e-retailers restricts equity ownership in sellers, caps percentage procurement for sellers from e-marketplaces, and puts curbs on marketplaces mandating exclusive partnership with brands or on providing favourable services to a few vendors. With these policy changes initiated to create a level playing field for all sellers, discounts came down, which resulted in slower growth in fiscal 2020. Thus, the industry grew 23% in fiscal 2020.

Consumption slowdown following COVID-19 affected demand in fiscal 2021, with the first quarter bearing the brunt on account of a ban on the sale of non-essentials. The sector performed exceptionally well during the festive season with demand coming in from tier-2- and tier-3 cities apart from metro and tier-1 cities. Social distancing norms and fear of spread of infection in the wake of the pandemic prompted people to shift towards online shopping. Online electronics sale, fashion, and food and grocery segment drove the growth of e-retail industry during the fiscal. Thus, where most sectors witnessed de-growth during the fiscal, online retail is estimated to have grown around 10-12%.

Overall, the industry is estimated to have clocked a CAGR of ~34% between fiscals 2017 and 2022 and estimated to be Rs 4000 billion to Rs 4100 billion in fiscal 2022.

Sector to continue its growth path in the medium term

The online retail sector witnessed healthy growth in fiscal 2022 on a low base of previous fiscal. Ban on sale of non-essential for most part of first quarter impacted demand to some extent. New launches in electronics during festive period and easy financing options drove growth during the year. With people leaving their homes after months of lockdown, fashion category too witnessed healthy growth with onset of festive season. Pandemic brought a change in the buying behaviour with more and more people taking online route. Going forward, players are expected to focus on customer convenience and their online experience rather than on only discounts. Entry of India's largest brick and mortar retailer Reliance Retail into the online channel will only intensify competition and benefit the customer and the industry. CRISIL MI&A Research projects online retail to clock 22%-25% CAGR between fiscals 2023 and 2025.

Funding expected to remain concentrated in the medium to long term

The e-commerce space witnessed aggressive funding in the past from investors. Investor sentiments were pretty strong as private equity investors / venture capitalists invested in newer start-ups through Series A and Series B funding, to try and identify the next unicorn, similar to Flipkart and Shopclues. The bigger players continued to receive funding.

However, off late, the number of players being funded has declined after the failure of majority of start-ups such as LocalBaniya, PepperTap and Shopo. The investors have become cautious and focused their funding as they eye profitability. Of funding of over Rs 1,500 billion in the online retail space since fiscal 2017 till the second quarter of fiscal 2022, the top two players have pocketed around 70% share. Investors have figured out that the top 2-3 players are going to survive and garner major market share. Over the medium to long term, we expect this trend of focussed funding to continue.

Exclusive launches and offers give competitive edge to several players

Several players have entered exclusive sale arrangements for electronics, smartphones, etc.

For example, Amazon is the exclusive seller for OnePlus. It also has exclusive selling contracts with ZTE sub-brand Nubia, Coolpad, BLU, Gionee and LG. In 2017, Mondelez India and Amazon partnered to sell chocolates and sweets through the online platform in the country. Similarly, Flipkart is the exclusive seller for Xiaomi, Lenovo, Alcatel, Panasonic, Honor, LeEco, Huawei and Motorola's latest range of smartphones.

In 2019 policy, government said marketplaces can't mandate exclusive tie-ups. However, it didn't say anything about a brand wanting to sell on a particular platform. A brand could still sell on a particular platform as they are free to adopt their channel and sales strategy. Thus, there were just some tweaks and changes in the agreement between marketplaces and the brand.

Going forward, CRISIL MI&A Research expects such partnerships to be pivotal for increasing market share for these companies. Furthermore, flash sales organised by players to boost sales, has added to the volume. For instance, Flipkart's Big Billion Day, Snapdeal's Singles Day / Savings Day, Amazon's Diwali Dhamaka, etc will continue over the medium term. Companies will target customers from across regions and offer deep discounts, thereby adding millions to the sales volume. Industry sources estimate that the third quarter of every financial year is likely to account for as high as 35-40% of the overall annual online retail sales due to flash sales as well as high festive demand.

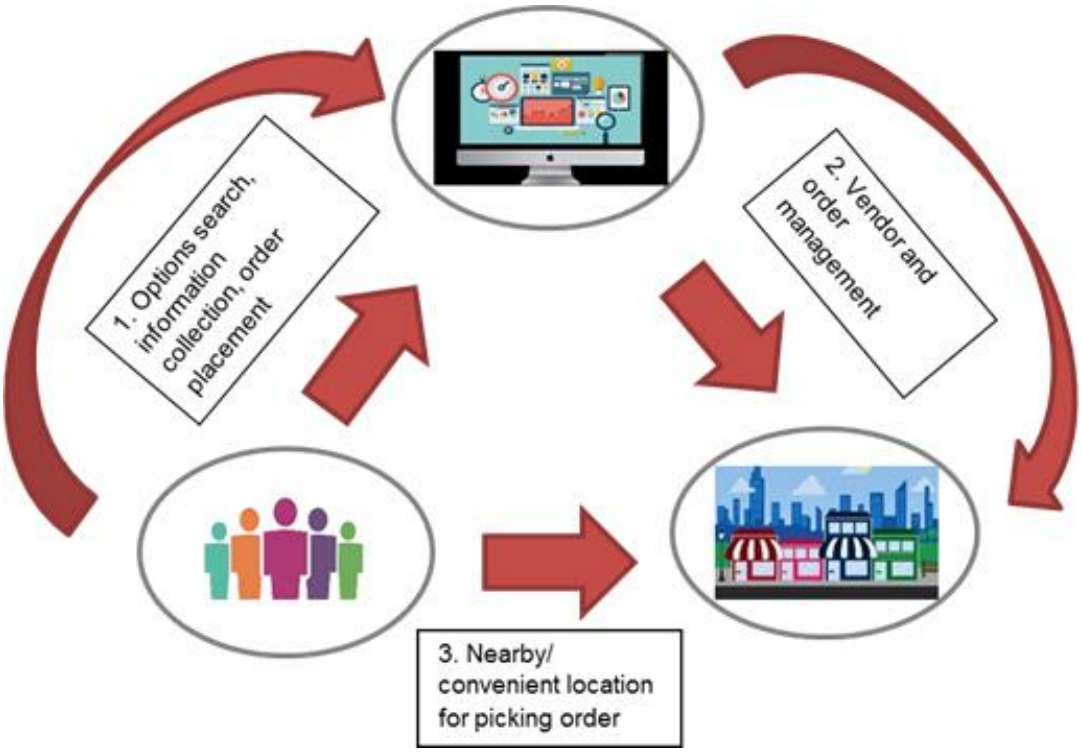
Private labels: An emerging trend

Selling on marketplace has generally been about selling products of different sellers and earning commissions. However, players in this space are now venturing out and having their own private labels. Players bring out private labels in this space based on the customer's need at an attractive price point, thus filling gaps in product offering. Flipkart acquired Myntra, that has significant presence of private labels that account for a significant proportion of its revenue. Flipkart launched “Flipkart Smartbuy”, an umbrella brand offering more than 50 categories.

Following suit, Shopclues introduced its private labels Home Berry (Home & Décor), MEIA (Workwear fashion for women), Baton (Footwear fashion for men) and Digimate (electronics) last year. Amazon has private labels known as AmazonBasics (electronics, home utility products etc.), Symbol (clothing), Myx (women’s ethnic wear) and Solimo (home and kitchen products, utensils etc). Private labels provide higher margin for e-tailers and cheaper prices to customers. But, with technology, and not retailing being the core competency for e-tailers, these players may find challenges ahead. Further, penetrating high value categories will be difficult as customers show brand loyalty in these categories. CRISIL MI&A Research believes private labels may show growth in smaller ticket size products. However, growth in high-value categories will be restricted.

Online-to-offline: new model on the block

This type of model allows customers to buy the online discounts in an offline store as well. Companies are now shifting their marketing strategies from traditional methods and focusing on various digital channels. The online-to-offline (O2O) model is where online portals tie up with offline retailers to offer products to customers. The products are usually perishable and have limited inventory. This model helps buyers find more choices in the area they live in.



Source: CRISIL MI&A Research

With an app, users can search their options, collect information, make a sound decision and then go to the physical store for trial and buy. This model helps retailers improve brand positioning and customer loyalty.

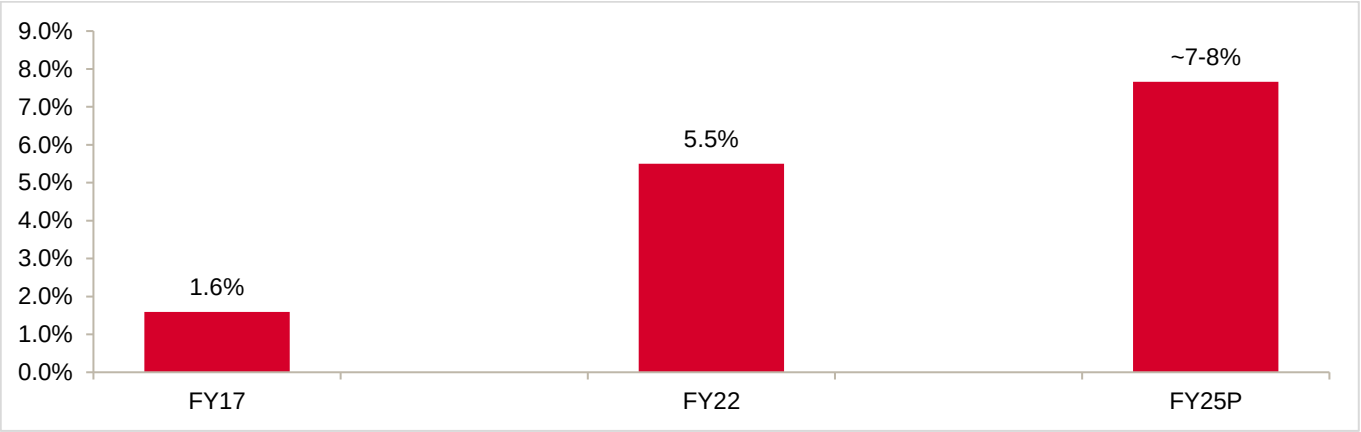
There has been an increasing interest in this type of model as Paytm and Reliance Retail have recently joined the game. Paytm Mall has recently forayed into online-to-offline (O2O) commerce. It catalogs inventories of physical shops to enable discovery of products online. The company is aiming to boost the business of local shops by bringing new customers who will be able to discover them on Paytm Mall site.

Reliance has entered e-commerce with the O2O model in online grocery. It has created a marketplace where the local businesses can connect and market their products. The seller can list their offerings on the marketplace. The interested customers can check product listings, make inquiries, book orders, and collect orders offline.

Limited penetration gives room for future growth

The overall retail market in India was estimated to be worth around Rs 73 trillion in fiscal 2022. The market is dominated by unorganised players, with organised retailing accounting for only 12-14% in fiscal 2022. E-retail penetration in the overall retail market is significantly low, thereby providing sizeable headroom for growth. By fiscal 2025, CRISIL MI&A Research expects share of e-retail in overall retail industry would reach to ~7%-8%.

Online retail market to account for 7%-8% of overall retail market by fiscal 2025



Source: CRISIL MI&A Research

Focussing on the bottom-line

E-commerce players are fortifying their bottom-line by focussing on the points mentioned below.

- **Building integrated processes**

  Players are acquiring, partnering with payment wallets, and providing complimentary product portfolio to enhance seamless operations. Acquisitions in the e-retail space are across the value chain. Companies have been acquiring established companies, online deal players and the likes to boost business and improve profitability (for example, Flipkart's acquisition of eBay India in April 2017 and Paytm's acquisition of Nearbuy and Little in December 2017 to boost its online-to-offline business model)

- **Using data-analytics to customise offers**

  Companies are using high-end data analytics to provide discounts. When compared with past trends, discounts in the space have reduced, and companies have adopted a customised discounting mechanism. Companies use the buying history of consumers, gap between two purchases, last purchase data and the likes, and accordingly make customised offers to ensure consumers stick to the portal. For instance, Amazon uses data analytics to extend special privileges to Prime members, such as faster delivery, better deals, and preference in case of limited sales quantity. Furthermore, players such as Myntra are using data mining and artificial intelligence to analyse popular designs and styles and then come up with new designs to place in the market.

Omni-channel presence — the new success mantra

The growing presence of e-retailers has eaten into the pan-India revenue share of brick-and-mortar retailers over past two-three years. After factoring in the surge in sales volume of e-retailers and consequent increase in competition from other online channels, brick-and-mortar players have started focussing on building their online sales presence. Companies such as Shoppers Stop, Bombay Dyeing, The Mobile Store, Trent, and Future Retail have launched online platforms to sell products. Though the revenue share of online channels has been very small, these stores are placing increased impetus on these to combat competition from their online counterparts. These brands are trying to outdo e-retailers' funding-dependent discounts by offering more sustainable membership benefits in the form of added discounts and loyalty points to get repeat customers.

On the other hand, instead of opening their own online channels, a large number of offline brands are adopting shop-in-shop model by partnering with top e-retailers for promoting their brands online or even for keeping a dedicated

brand page on the e-retailers' website. This serves the dual purpose of increasing presence while not incurring added investments in technology and logistics.

Online players too are focussing on expanding in the offline segment. The table below shows the actions taken by both online and offline players to increase their omni-channel presence. Players have been increasingly keen on tapping the food & grocery segment, given its growth potential.

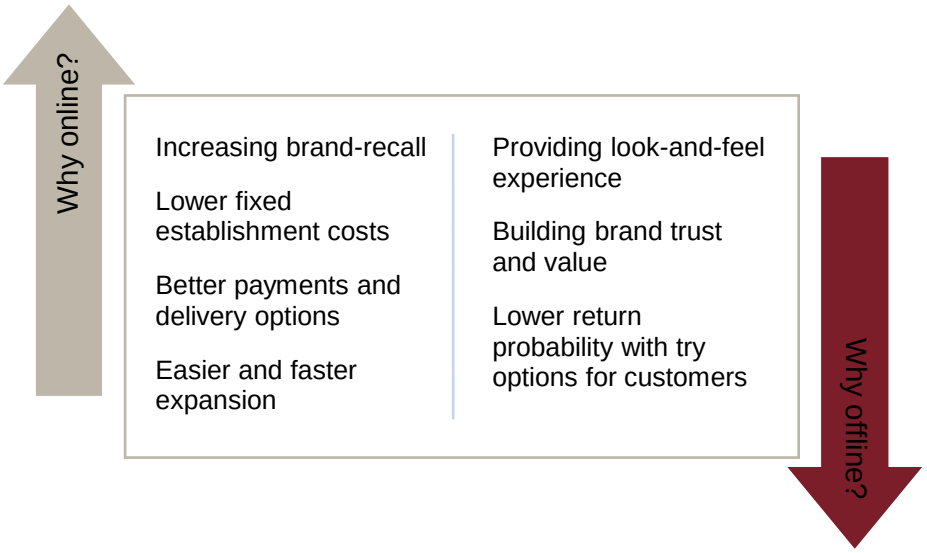
Hence, considering that both online and offline models have their respective benefits, CRISIL MI&A Research believes that more brick-and-mortar players will shift towards adopting and strengthening their omni-channel presence (and vice-versa) to strengthen their brand names.

Players focusing on omni-channel

Company name	Steps taken by companies
Reliance Retail	• Launched Jiomart in 2020 to sell groceries online • Bought Mumbai-based hyperlocal delivery company Grab a Grub Services • Acquired C-Square Info Solutions, a company that provides software solutions for distributors and retailers • To launch new ecommerce platform in Gujarat by tying up with 1.2 million small retailers
Pepperfry	• Started offline studios where customers can touch, feel & experience products • Offline sales-30%+ • Currently 60 offline stores in 20 cities
Flipkart	• Pilot project in Telangana to on-board Kirana stores for pushing omni-channel strategy • Kiosks rollout planned in Bengaluru to sell private brands • Set up first offline store in Bengaluru in furniture segment
Amazon	• 5% stake in Shoppers Stop • Stake in 'More' • Started "Smart Stores" concept recently
Shoppers Stop	• Relisting its products on Amazon through its subsidiary Shoppersstop.com • Exclusive flagship store on Amazon after 5% stake sale
Future Retail	• Started listing nearly all its brands and products across fashion, grocery and electronics on Amazon • Launched Tathastu or Retail 3.0 which is an omni-channel strategy
Caratlane	• Currently 95+ stores, plans to add 50 stores every year • Offline revenue-60%+
ABFRL	• Acquired Jaypore.com, an e-tailer, selling apparel, home textiles and accessories online

Source: CRISIL MI&A Research

Together, brick-and-mortar and online strategy complement each other



Source: CRISIL MI&A Research

Need for open e-commerce network

Over the last one decade there has been major transformation in the way commerce has been carried out. In present era online purchases are experiencing strong growth owing to rising income level, rising number of smartphone users, change in lifestyle and preferences, and improved logistics services. Advancement in IT infrastructure has been the backbone supporting robust growth in e-commerce. However, the e-commerce industry is still under growth phase and certain concerns which exist in the current scenario such as malpractices followed by players, barriers in launching new products, and limited reach to audience need to be addressed. Open Network for Digital Commerce (ONDC) is one such solution government is planning to implement to make the overall e-commerce market more efficient and inclusive.

ONDC can expand overall e-commerce market and can curb existing malpractices

The ONDC is a digital project of the government to redefine the e-commerce landscape in the wake of a large number of complaints of malpractices by existing e-commerce companies. To standardise the process of on-boarding retailers on e-marketplaces, and supply and delivery of products through online channels, the Department for Promotion of Industry and Internal Trade (DPIIT) has developed ONDC to set protocols. The protocol for digital commerce would be similar to what UPI is for online payments or what HTTP is for communication over the internet. These will be open standards and the effort is to create protocols for digital e-commerce for creating an enabling e-commerce ecosystem.

Currently, market players have concerns over the manner in which activities such as predatory pricing, deep discounting, and funding the losses are carried out. Such unfair advantages make the task difficult for small players to compete in the marketplace. Other practices which are cause of concerns are having arrangement with brand companies for selling certain products exclusively on e-commerce platforms, controlling inventory, and nexus of the banks with e-commerce companies for giving cashbacks.

ONDC aims to provide equal opportunities to all traders by providing an easy and fair access to e-commerce. It will facilitate small businesses with opportunities to adopt and accept the online market as an additional business avenue for them. The consumers will also be equally benefitted by getting the option to choose a better product, coupled with reasonable price and with efficient and responsible delivery system.

Apart from putting a control on malpractices, ONDC can improve the agility of market players by letting them implement more lightweight, agile digital commerce solutions to improve the customer experience and lower total cost of ownership. With faster execution, market players can integrate newer ideas to open new functionalities and creating new markets along with keeping a check on cost-to-market.

Benefits of open network in e-commerce

Increasing the market access

With the help of an open network, small businesses can display their products on the network and make themselves discoverable, which currently is a difficult task. Open network can wipe out the perennial dependency on a central marketplace as a platform, making the decentralised open-network platform more inclusive for merchants of all sizes.

Reduction in the cost of doing business

To operate on centralised platforms, merchants need to market their offerings to make themselves visible. On open networks, businesses save on additional advertising cost, bringing down the overall cost-to-market. Marketing cost poses a hindrance for innovation to scale up the business. Open network can help new businesses to ramp up the operations with more visibility at lesser cost. Along with that, merchants can also see a reduction in customer-acquisition cost and cost to retain customers.

Making the market perfectly competitive

Open network got the potential to add more merchants to the ecosystem. Currently, the market is an oligopoly. Decentralisation of e-commerce platform can make it easier for small businesses to launch their products on online platforms. With the addition of merchants, the market structure will change to become perfectly competitive.

Availability of more options for the consumers

For a consumer, with an open network, it will become easier to access the increased number of choices online on a single consumer platform. The neighbourhood stores – which are brought online using their respective online platform providers built on an open network – can be discovered by consumers, adding tangibility to the e-commerce transaction.

Summing up all the benefits, open network in e-commerce can be the next big event that can expand the overall industry's pie, bring efficiency to operations, and make the marketplace perfectly competitive with a check on existing malpractices.

5.3 Growth drivers of e-retail industry

Source: CRISIL MI&A Research

Rising income levels aid to increasing demand of retailing

Growth in household incomes and, consequently, disposable incomes, are critical to the overall growth in demand for retail products. The rise in people's income over years has eventually led to an increase in the consumption of consumer goods. The combined mix of greater purchasing power and willingness to spend has resulted in a change in consumption patterns. Increasing literacy rate and changing mindsets have led to an increase in the number of working women in India. The government has also taken several steps to create a congenial workplace. This is expected to further aid the increase in the number of working women in the coming years, supporting overall rise in the income level. The share of households falling in the income bracket above Rs 0.2 million is expected to go up to 35% in fiscal 2022 from 23% in fiscal 2017. The growing presence of a large middle-class population has played a key role in driving demand for the retail sector

India’s per-capita income rose at ~4% CAGR between fiscals 2012 and 2022

India’s per-capita income, a broad indicator of living standards, rose from Rs 63,462 in fiscal 2012 to Rs 92,583 in fiscal 2022, or at a ~4% CAGR. This growth was led by better job opportunities, propped up by overall GDP growth. Moreover, population growth remained stable at a ~1% CAGR. The per-capita income increased by 7.6% in fiscal 2022, but in absolute terms it is yet to recover to the pre-pandemic levels (fiscal 2020 levels). Increasing purchasing power of Indians in the form of per-capita net national income has remained a key factor to drive the demand for retailing.

Favourable working age population to influence consumer spending

India's favourable demographics are a powerful driver for the retail sector. India has a rapidly growing and relatively young population, with a median age of 27.3 years as of 2020. Younger Indians display a generational shift in spending behaviour, being less price-conscious than their predecessors.

This trend is expected to continue up to 2030, implying strong potential for an increase in income, and consumer spending, with a growing proportion of the population engaged in employment.

Urbanisation to reach ~40% by 2030

India's urban population has been rising over years and stood at ~31% of total population in 2010; the uptrend is expected to continue. The UN report has projected that nearly 40% of the country's population will live in urban areas by 2030. People from rural areas move to cities for better job opportunities, education, and quality of life. The entire family or only a few individuals (generally an earning member or students) may migrate, while the other members continue living in rural house. Numerous schemes and projects launched by the government, such as the Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana (Urban), among other initiatives, has aided the growth in urbanisation. This rapid urbanization is expected to contribute to significant market potential for the retail sector.

Internet subscribers up at a CAGR of ~16.0% between fiscals 2016 and 2022

Internet penetration has significantly deepened in India over the past 6-7 years, driven by an increase in the use of smartphones, ease of internet access in rural areas, as well as cheaper data plans offered by ISPs. Internet subscriber additions are expected to be to be driven by low rural tele density, which will take up the internet penetration in the country to 73-77% by fiscal 2026 from current level of 60-61%. The deeper penetration of Internet, coupled with an increase in the number of smartphone users and affordable date plans, has increased the accessibility to e- commerce. The online grocery and retail channels have gained prominence, which is likely to further boost the growth of retail sector.

Nuclearization of families to drive consumption

Increasing nuclearization of families is driving up consumption expenditure. In the recent past, the number of nuclear families, as a percentage of total household population, has increased. The average household size of the country has come down to 4.91 in 2011, from 5.57 in 1991.

Change in consumer needs, attitudes, and behaviour to determine consumption pattern

Growth of retail is linked to consumer needs, attitudes, and behaviour. Rising income levels, education and global exposure have contributed to evolution of the middle class. As a result, there has been a gradual shift in the consumption pattern of Indians. Demand for better quality, convenience and higher value for money have increased demand for branded goods. People are willing to experiment with new products and look different. This has further augmented spends on health and beauty products, apart from apparels, food, and grocery items.

Better credit availability, increasing penetration of plastic money to aid spending

With the easy availability of credit, the market for personal loans has seen significant growth in India, pushing up spends on housing and consumer durables. The ease of making payments with credit and debit cards has led to a sharp increase in consumer spending in recent years.

6 Assessment of fintech industry

6.1 Overview of fintech industry in India

Fintechs today are on top of the mind of traditional financial institutions as they watch traditional business models change, and increasingly deliberate whether to collaborate or compete with fintech. The term Fintech is used to describe firms that leverage technology, data, and business insights to provide various financial products and services to customers. The business model of fintech firms differ widely but in almost all cases they use technology to change or support existing way of doing business, and hold the promise of enhancing customer convenience, facilitating access to credit for hitherto unserved or underserved customer segments and/or improving operating efficiency. The emergence of fintech firms has enabled customers create formal records through digital payments or transaction data and thereby improve their access to credit.

Digital payments landscape has the highest number of fintechs in India and now other financial segments like lending, insurance, wealth etc. are also attracting fintechs.

Players using digital medium across different financial segments

Financial segments	Business segments	Examples of such players present in the segment
Payments	Payment banks Payment aggregators P2P Payment solutions Prepaid payment instruments	Fino Payments Bank, Pine labs, PayTM, Razorpay, BillDesk, MSwipe, PayNearby, PhonePe, GooglePay, Mobikwik, PayU
Lending	Digital lenders Intermediaries	LendingKart, Capital Float, Bankbazaar, EarlySalary, LazyPay
Wealth tech	Investment platforms Robo advisors Thematic Investing Discount brokers	Zerodha, Kuvera, FundsIndia, Upstox, Groww, PayTM Money
Insure tech	Digital Insurers Digital insurance advisors	Acko, Digit, Policy Bazaar, VahanCheck, Coverfox
Reg tech	Accounting Tax compliance	Fintellix, FixNix
Open/ Neo banking	Neo banking platforms	Niyo, Open, Jupiter

Digital payments landscape in India is being driven by fintechs along with India's unique digital public infra and embedded offerings. Fintechs are now also expanding beyond their core offerings to increase engagement, the addressable market and to drive monetisation. For example, players like PayTM and PhonePe with core offerings as payments and wallets, respectively, have expanded into e-commerce and investing services. Fintechs, having acquired a substantial user base, are also offering short-term credit and small ticket personal loans in partnership with banks. PayTM, Flipkart and Amazon, for example, provide short-term credit (15-30 days) of Rs 5,000-60,000 for online spends.

In India, growth of fintech has been driven by a confluence of factors:

- **Favourable demographics –** India has a population of close to 500 million Generation Z or Gen Zers– defined as those born after 2001. The most defining aspect of this generation is that they have no idea about what the world was before the internet. In some sense, they are digital natives, and are therefore, more likely to uptake digital products/services, provided that they are relevant to the context in which they operate. Moreover, increasing technology adoption by the millennials (Generation Y), who also form a major proportion of the population, will also drive the growth of technology-oriented platforms and fintechs in India

- **Rising Internet penetration** – The internet subscriber base has grown from 343 mn in fiscal 2016 to touch 851 mn as of September 2022. CRISIL MI&A Research expects over 950 million subscribers to be using the mobile internet by fiscal 2026 due to the ubiquitous availability of high-speed internet services and increasing affordability of services and handsets.

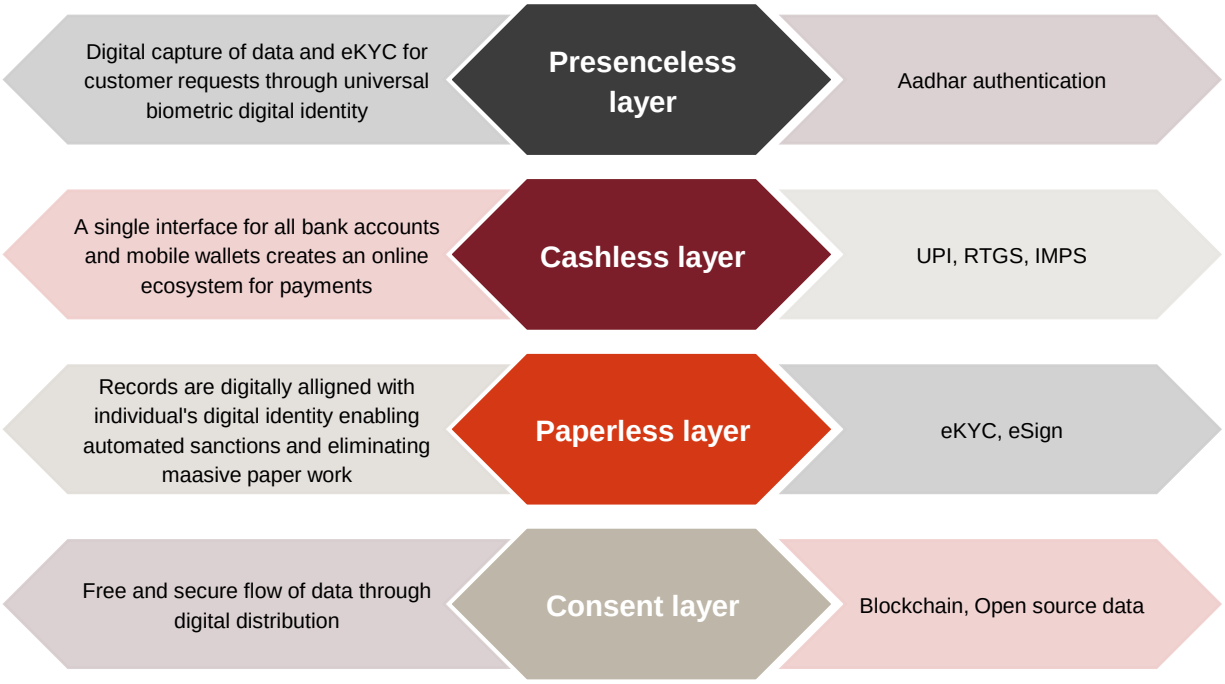
- **Availability of low-cost infrastructure –** Payment service providers such as NPCI, Mastercard and Visa and other infrastructure providers such as mobile phone manufacturers and internet service providers have been continuously working towards lowering the cost of digital infrastructure. This has helped support fintech solutions.

- **Changing customer expectations**: With rising incomes and awareness, and development of technology, consumer behaviour and expectations are changing rapidly. Consumers, used to an instant experience, whether for making purchases (through e-commerce websites) or for travelling (through cab hiring firms), are demanding a superior experience from other service providers such as lenders as well – paperless, faster, seamless, and convenient. The demographic shift to digitally literate younger consumers and their inclination to constantly look for better deals means customers' propensity to shift has increased, too.

- **Availability of huge amount of data and related intelligence –** Increased use of smartphones coupled with rising internet penetration, use of wearables, telematics, Internet of Things (IoT) and other connected devices is helping players to capture customer data from alternate sources and build social and psychological profiles of customers, thereby enabling accurate and faster decision making. For example, a lot of data on retail customers is being generated whenever they use web search, mobile applications, shop/browse on e-commerce websites, and undertake banking transactions. Using big data analytics, AI and ML, technologies, firms can process the data more efficiently and provide personalized offerings to customers.

- **Key government initiatives** – One of the key initiatives by RBI has been the launch of United Payment Interface (UPI), bringing multiple payments service providers on to a single platform and enabling swift payment. IndiaStack has lowered the cost of consumer on-boarding and transactions significantly.

- IndiaStack provides distinct technology layers:



Source: IndiaStack, CRISIL MI&A Research

Government initiatives like JAM (Jan-Dhan, Aadhaar, and Mobile) has enabled government to make around Rs 6.7 trillion of direct transfers for fiscal 2023. Other programs such as Digital India, Start-up India have fuelled the growth of fintechs in India.

Key technologies shaping fintech

Technological developments and continuous progress in the maturity of technologies has helped shape up the fintech market. Application Programming Interface (API) standards, for instance, have enabled different pieces of software from different financial players to interact and exchange data in a secure environment, enabling comparisons and more competition. APIs are the main reason that startups are able to build their products faster.

However, there are challenges as well when it comes to usage of technology. AI, for instance, is dependent on credible and quality data, and therefore, service providers putting in place structured mechanisms for collecting, validating, standardizing and archiving data to make it relevant for AI.

Application of technology by fintech

Cloud
- Offers immense computing power and storage, enabling fintech firms to streamline product offerings according to user demand near real time

Big data and analytics
- Helps companies in gaining insights and predictive analysis based on consumer data and behaviour

Artificial intelligence
- Aides data driven decisions at lower cost to provide innovative experience to customers efficiently

Biometrics
- Enables secure and convenient authentication for KYC, mobile applications and payments

Internet of things (IoT)
- Enables fintech firms to enhance monitoring and risk assessment for services provided to customers

Open source/API
- Transparent and decentralised nature of open source system enables firms to understand challenges and benefits faced by other firms

Blockchain
- Enables companies to explore cost efficient way of operations, assure transparency and quicker & enhanced customer experiences

Machine learning
- Enables easy interpretation of large amount of data of customers through their digital footprints

Robotics
- Helps firms to streamline processes and improve customer experiences

Chatbots
- Chatbots helps in providing an initial layer of customer interaction, bringing in efficiency and higher customer satisfaction

Going forward, India presents a huge opportunity for growth of fintechs owing to high potential in the underpenetrated customer segments. Most fintech firms today target customers who use smartphones and value convenience and timely availability of credit. To attract mid-to-low-income customers and the rural population, there is a need to develop tailor-made solutions and adequate use-cases by overcoming challenges posed by low literacy, lack of trust, low awareness and behavioural factors. Given the improvement in support infrastructure (electricity and internet connectivity and IndiaStack), this segment provides huge potential to grow.

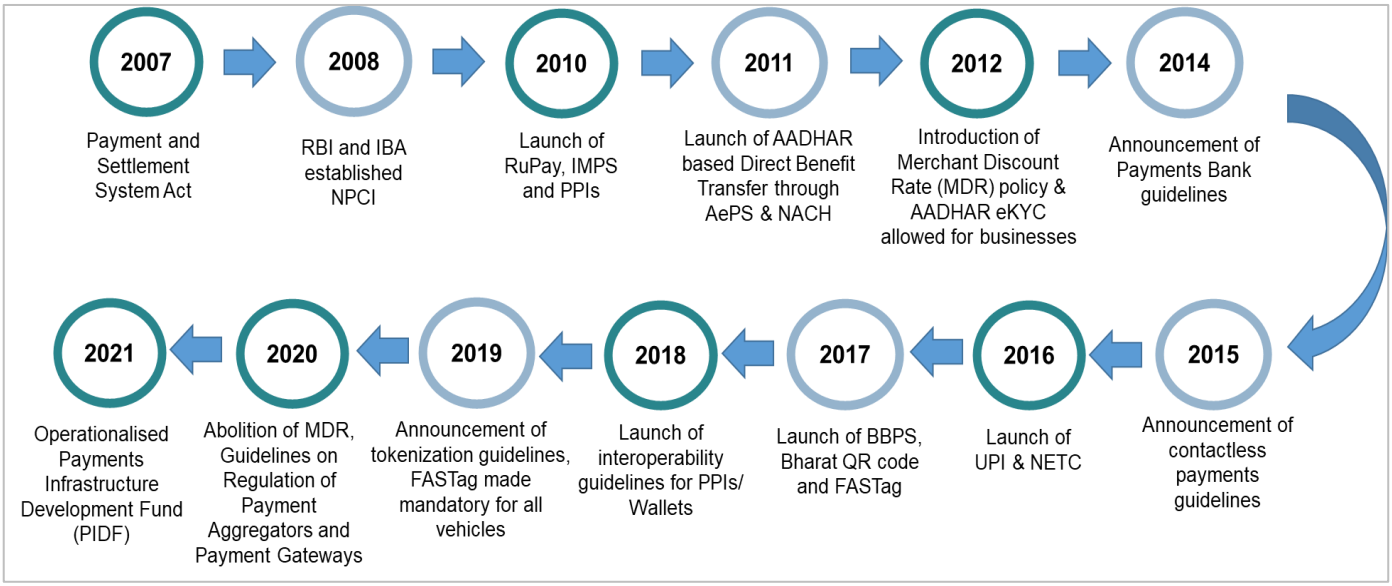
6.2 Assessment of Digital Payments Industry in India

Overview and trends

The Indian digital payment space has seen extraordinary growth in the last few years. The growth has been driven by multiple factors like launch of new payment products, increasing smartphone penetration, increasing mobile internet users driven by lower data charges and a strong push from the government in order to increase adoption of digital channels. The government has used levers such as ubiquitous availability of mobile broadband, increase in smart phone penetration and various incentives for the use of digital payment products to support the country's digital payments journey. In 2008, Reserve Bank of India (RBI) and Indian Bank's Association (IBA) established National Payments Corporation of India (NPCI) to create a robust payment and settlement infrastructure in India. Since, then numerous regulations and guidelines have been passed to facilitate and boost the growth of digital payments in India.

NPCI has a diversified shareholding structure with several prominent public and private sector banks, SFBs as well as players offering payment services picking up stake in NPCI over a period of time. As of 30th April 2023, NPCI had 65 shareholders. At the time of its inception, NPCI had ten core promoter banks – State Bank of India (SBI), Punjab National Bank (PNB), Bank of Baroda (BOB), Canara Bank, Union Bank of India, Bank of India, HDFC Bank, Citibank, HSBC and ICICI Bank.

Evolution of digital payments space in India



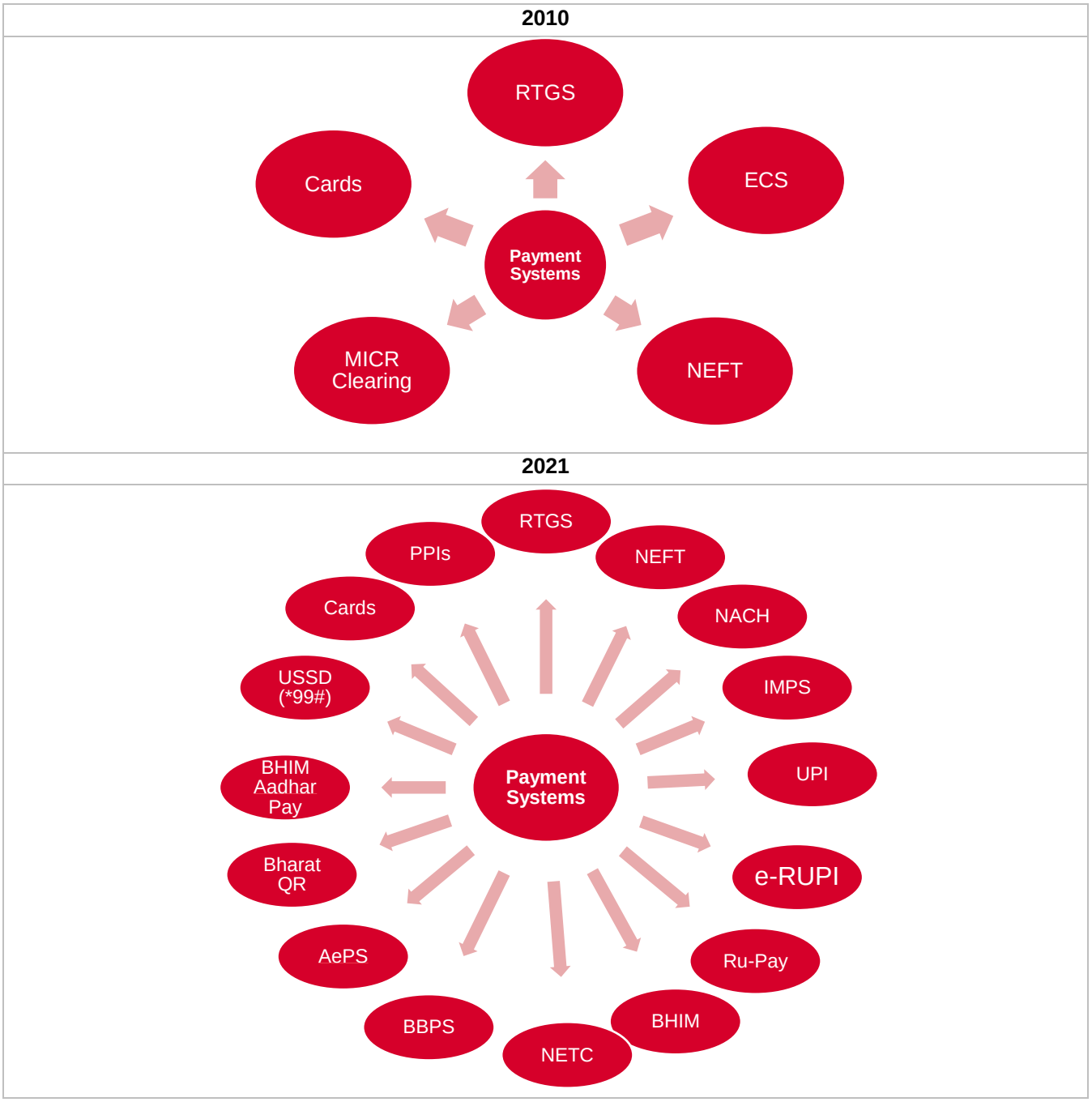
Source: NPCI, RBI, IndiaStack.org, CRISIL MI&A Research

Over the last decade, NPCI has launched various innovative products like Unified Payment Interface (UPI), National Electronic Toll Collection (NETC) and Bharat Bill Pay Service (BBPS), AADHAR Enabled Payment System (AePS) and other retail payment and settlement systems. The convenience of these payments systems along with ubiquitous availability of mobile broadband has ensured acceptance as they provided consumers an alternative to the use of cash and paper for making payments. The participation of non-bank fintechs in the payment ecosystem in the form of Prepaid Payment Instruments (PPI) issuers, Bharat Bill Payment Operating Units (BBPOUs) and other third-party application providers in the UPI platform has furthered the adoption of digital payments in India. Further, in April 2020, to increase the global outreach of NPCI payments systems, a subsidiary NPCI International Payments Limited (NIPL) was established to export offerings of NPCI in the foreign markets with primary focus on internationalisation of RuPay

and UPI. In January 2021, the (RBI) on operationalised the payment infrastructure development fund (PIDF) scheme which is intended to subsidise deployment of payment acceptance infrastructure in tier-3 to tier-6 centres, with a special focus on the north-eastern states of the country.

These innovations have led to the emergence of various players such as Payments Bank (such as PayTM Payments Bank and Fino Payments Bank), Fintechs (such as Razorpay, PayU, and PayTM) and incumbent banks (such as Axis, HDFC Bank, ICICI Bank) too have launched their own digital payment platforms. Consumer apps provided by Google (Google Pay), Amazon (Amazon Pay) and Walmart (PhonePe) have created a strong presence in UPI payments to strengthen their foothold in the digital payments space. These fintechs and usage of their application for payments is also helping the consumers create formal transaction records, which will ease access of credit in times to come.

Evolution of India's payment system over the decade

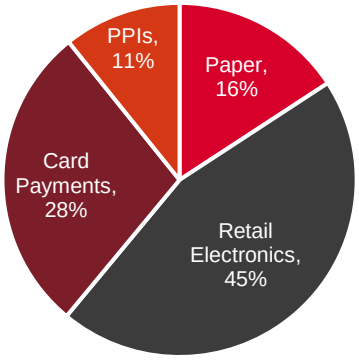
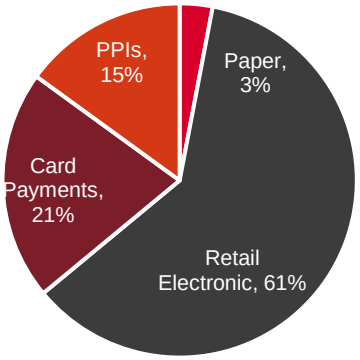
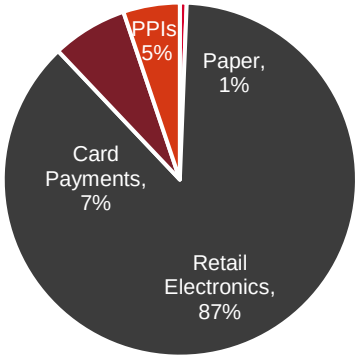


Note: NEFT- National Electronic Fund Transfer, RTGS – Real Time Gross Settlement, MICR- Magnetic ink character recognition, IMPS – Immediate Payment Service, NACH – National Automated Clearing House, BHIM – Bharat Interface for Money, USSD – Unstructured Supplementary Service Data, PPI – Prepaid Payment Instrument, UPI – Unified Payment Interface, AePS – Aadhaar Enabled Payment System, BBPS – Bharat Bill Pay Service, NETC – National Electronic Toll Collection ; Data in the chart shows the types of payment modes and not the market share

Source: RBI – Payment & Settlement System in India, NPCI, CRISIL MI&A Research

With the advent of various innovative electronic systems and payments products, the Indian ecosystem has witnessed a shift in the payment preference. The share of paper-based clearing in terms of volume has reduced from 16% of the total retail payments in FY16 to just 1% of total retail payments in FY23. In terms of value, the share of paper-based clearing has declined from 46% in FY16 to 11% in FY23.

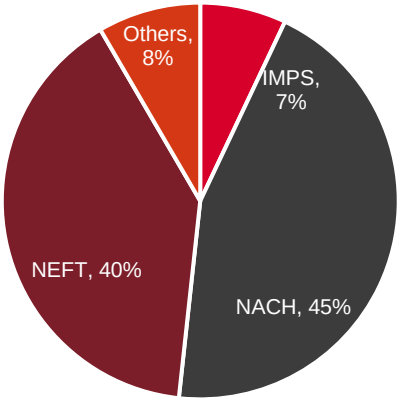
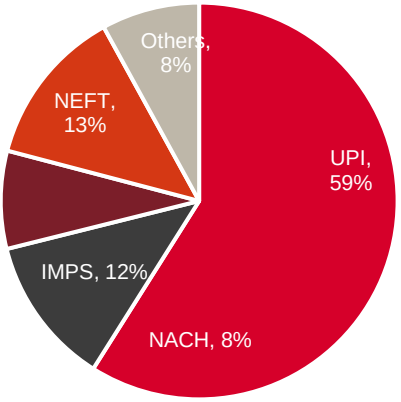
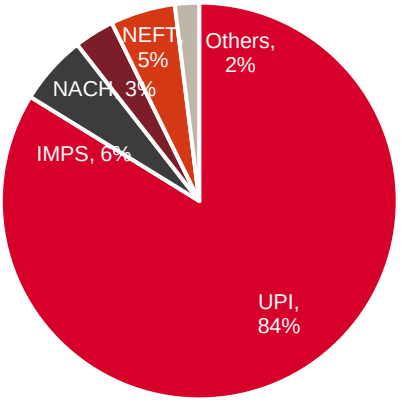
Share of retail payment system by volume (FY23)

FY16 Transaction Volume – 6.9 billion	FY20 Transactions Volume – 34.9 billion	FY23 Transactions Volume – 114.4 billion
		

Note: Retail electronic include credit transfers (NEFT, IMPS, UPI) and direct debit transfers (ECS & NACH)

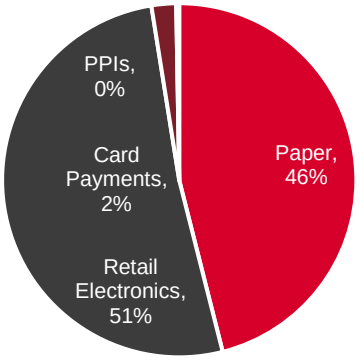
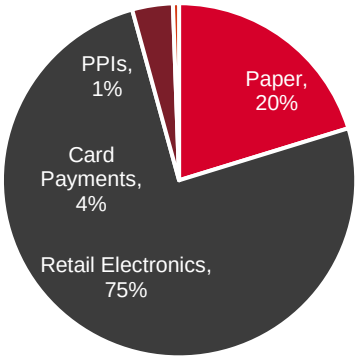
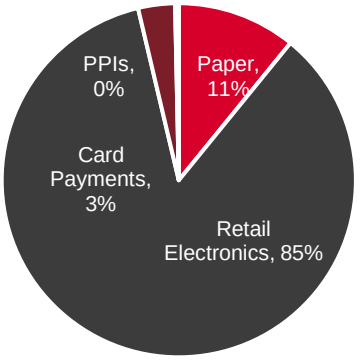
Source: Payment and Settlement System in India - RBI, CRISIL MI&A Research

Retail electronic payment mix by volume (FY23)

FY16 Transaction Volume – 3.1 billion	FY20 Transaction Volume- 21.2 billion	FY23 Transaction Volume- 99.9 billion
		

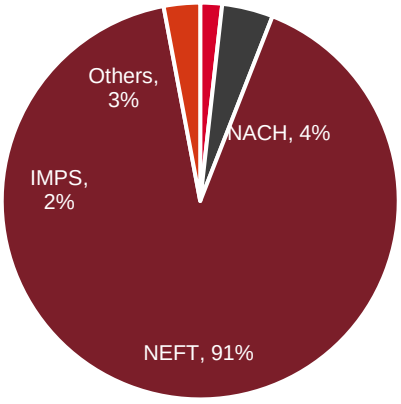
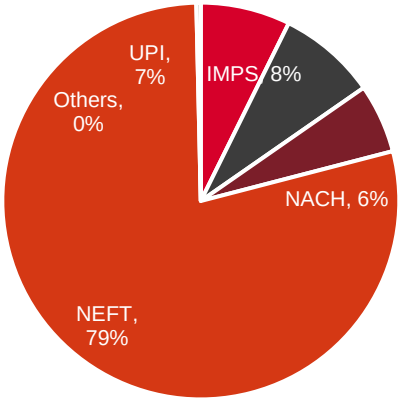
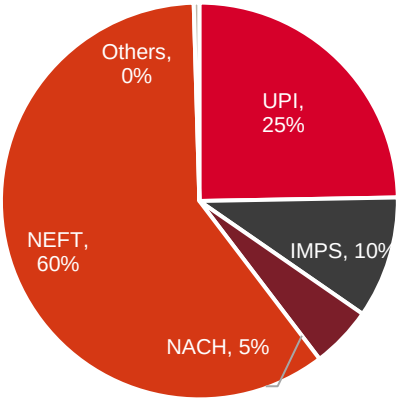
Source: Payment and Settlement System in India - RBI, CRISIL MI&A Research

Share of retail payment system by value (FY23)

FY16 Transaction Value- Rs. 178 trillion	FY20 Transaction Value – Rs. 386 trillion	FY23 Transaction Value – Rs. 659 trillion
		

Note: Retail electronic include credit transfers (NEFT, IMPS, UPI) and direct debit transfers (ECS & NACH)
Source: Payment and Settlement System in India - RBI, CRISIL MI&A Research

Retail electronic payment mix by value (FY23)

FY16 Transaction Value – Rs. 91 trillion	FY20 Transaction Value – Rs. 292 trillion	FY23 Transaction Value – Rs. 563 trillion
		

Source: Payment and Settlement System in India - RBI, CRISIL MI&A Research

With changing dynamics, banks and other financial institutions have also adopted newer business models. Payment infrastructure, which earlier used to be a cost centre for banks, has now turned into a core offering and a point of creating differentiation. The customers are now seeking ease of transaction at cost effective prices across various platforms. This has also led to strong collaboration between banks and fintechs to enable payments modernization and financial inclusion.

Digital and cash transactions

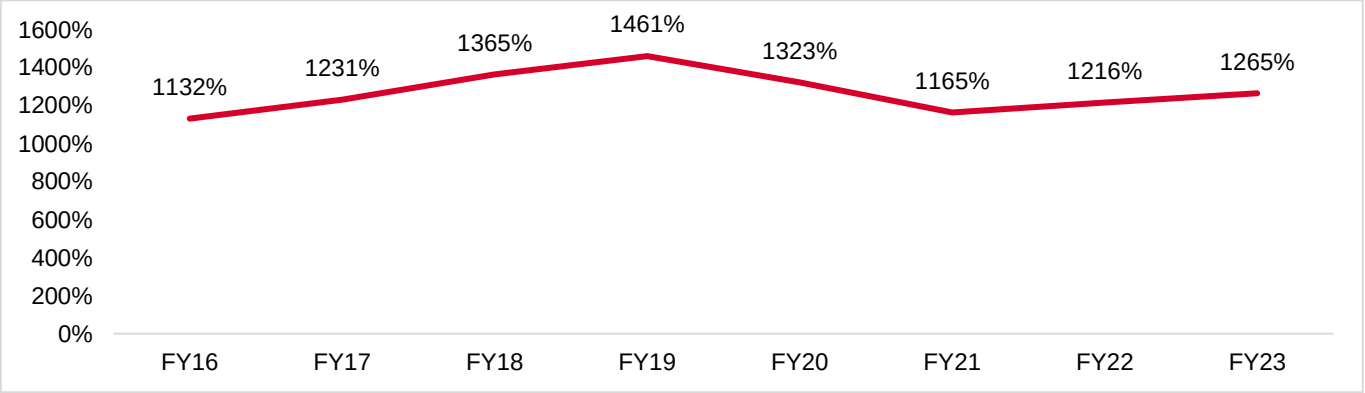
Surge in digital transaction volumes reflected in rising share

While usage of cash remains high, particularly in person-to-merchant transactions in India, we have observed a surge in digital transactions in the past few years, led by government and regulatory initiatives and changing consumer preferences. JAM (Jan Dhan, Aadhaar and Mobile), demonetisation of high-value currency notes in November 2016, implementation of GST in July 2017 and unveiling of the Unified Payments Interface, or UPI, are some of the notable regulatory initiatives that have spurred growth in the space. Digital payment volume (*digital transactions includes, Retail Electronic Clearing, Prepaid Payment Instruments, RTGS – excluding interbank clearing, ECS, NEFT, IMPS, NACH and card transactions at ATM)* has increased over 7 times by fiscal 2023 from fiscal 2018 level owing to factors such as a younger population, rising smartphone penetration, increasing mobile internet users, convenience of transacting digitally, and booming ecommerce sector. The transaction value of digital payments witnessed a CAGR of 8.8% to reach Rs. 2,087 trillion in fiscal 2023 from Rs 1,370 trillion in fiscal 2018.

In FY23, transaction volumes for digital payments reached 113.9 billion as compared to 72.0 billion in FY22, thereby registering a growth of 58% on year. The transaction value of digital payments also witnessed a growth of 20% to reach Rs. 2,087 trillion in FY23 as compared to Rs 1,744 trillion in FY22. Going forward, the trend is expected to continue as digital payments gain in popularity and become more ubiquitous.

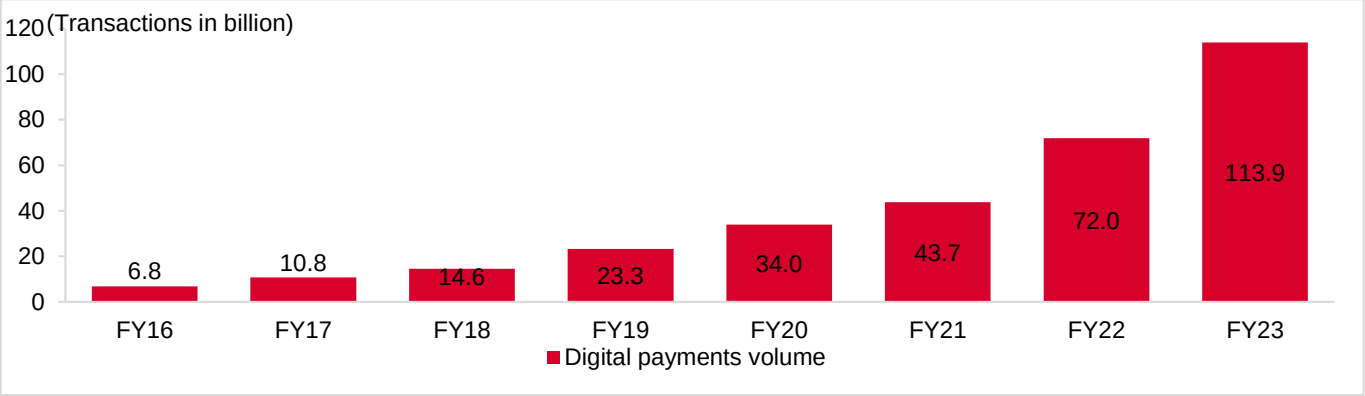
The value of digital transactions as a proportion of private consumption expenditure in between fiscal 2016 and fiscal 2023 also rose from 1132% to 1265%, which shows that the usage of digital transactions for consumption has been on the rise over the past few years.

Digital transaction value as a % of private final consumption expenditure (PFCE)



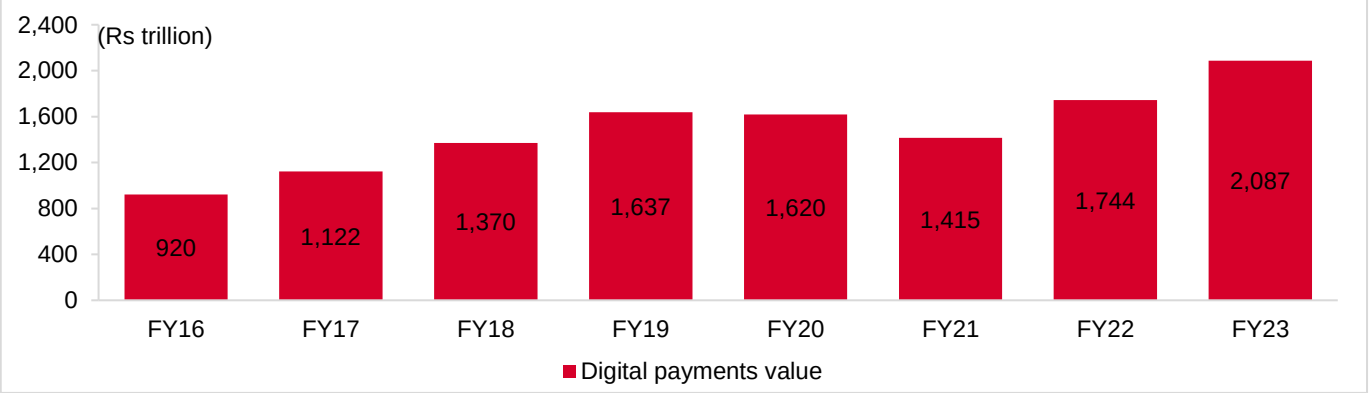
Note: PFCE is based on current prices.
Source: RBI, CRISIL MI&A Research

Rapid growth in number of digital payments transactions in India



Note: Digital transactions includes Retail Electronic Clearing, PPIs, RTGS – excluding interbank clearing, ECS, NEFT, IMPS, UPI, Mobile Banking, NACH & card transactions at ATMs; Source: RBI, CRISIL MI&A Research

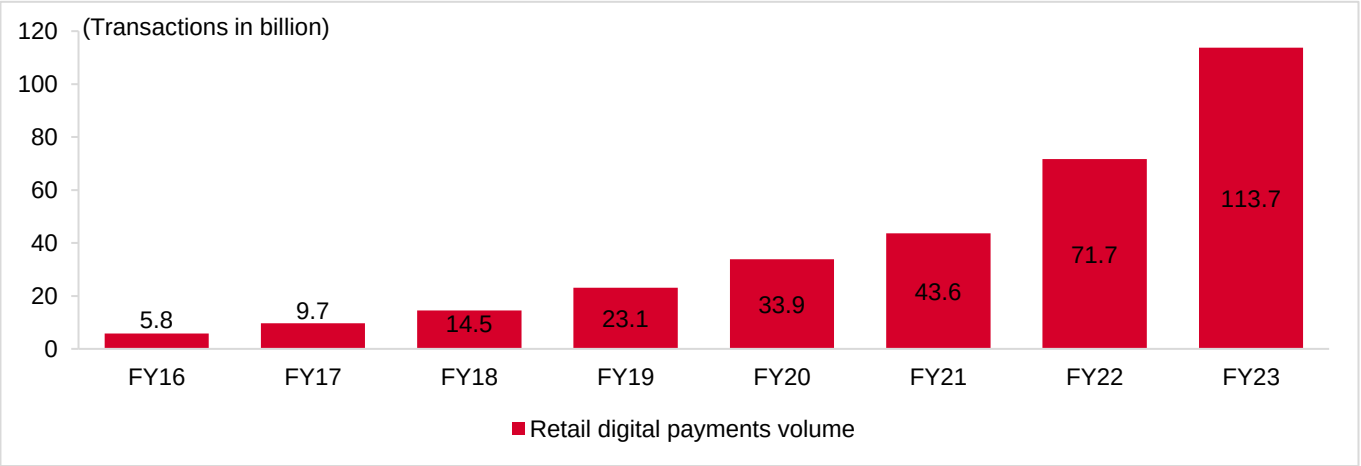
Digital payments transactions growth (in value terms) mirrors the rise in volumes



Note: Digital transactions includes Retail Electronic Clearing, PPIs, RTGS – excluding interbank clearing, ECS, NEFT, IMPS, UPI, Mobile Banking, NACH & card transactions at ATMs; Source: RBI, CRISIL MI&A Research

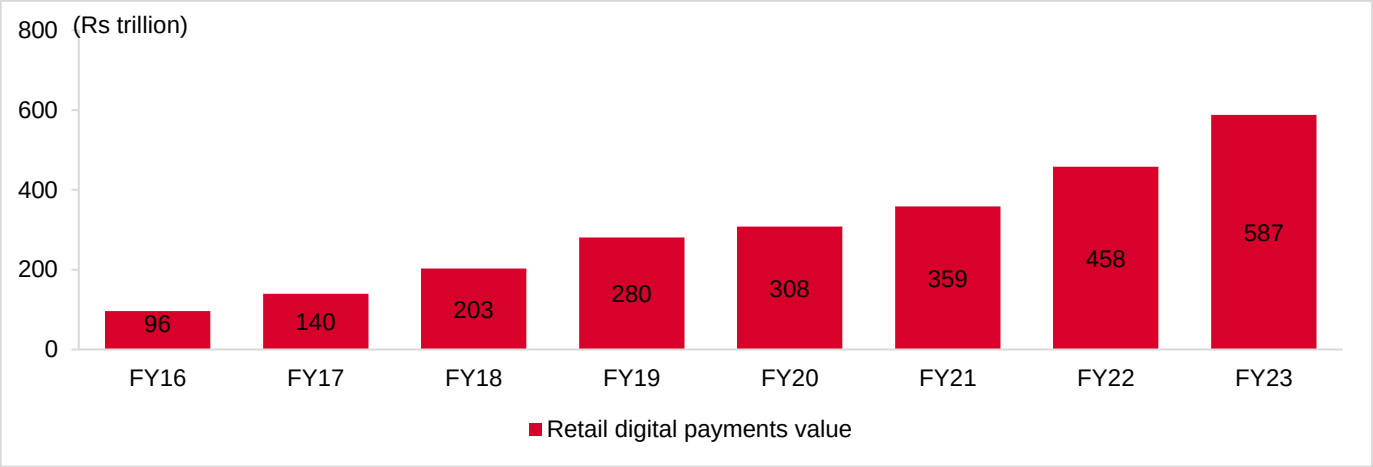
In fiscal 2021 and 2022, retail electronic digital transaction such as UPI, AePS, NETC and BBPS saw a sharp rise in transaction volumes as people preferred to transact via contactless payments system, owing to outbreak of Covid-19. Going forward as well, the convenience of digital payments, ease of usage, and recipients also increasingly preferring digital payments would result in some sections of consumers continuing to prefer this medium. This, along with the continuous rise in retail spends, will drive growth for digital transactions.

Retail digital payment transaction volumes have grown at 53% CAGR between 2016 and 2023;



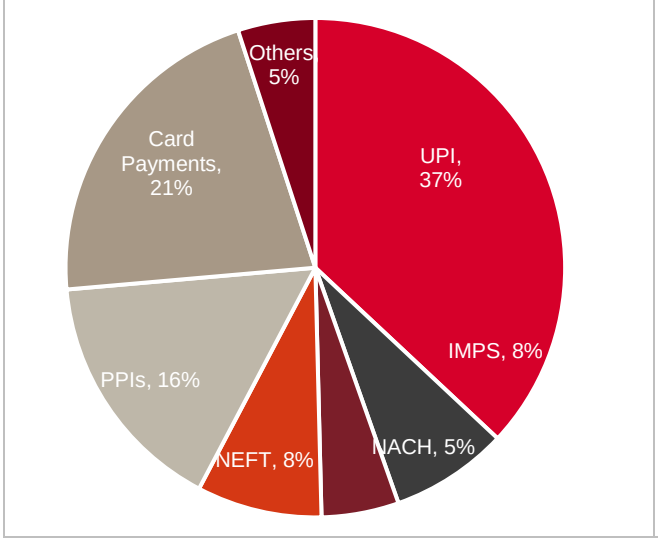
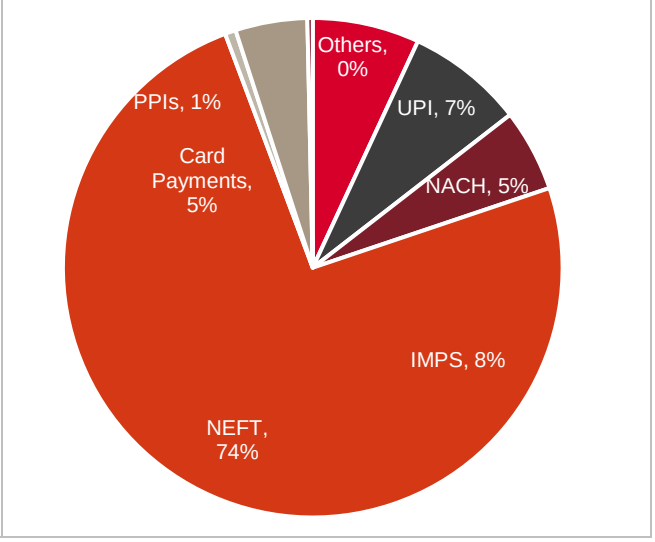
Note: Retail digital payments include all digital payments except RTGS and Paper Clearing; Source: RBI, CRISIL MI&A Research

…Value growth in retail digital payments transactions also extremely strong



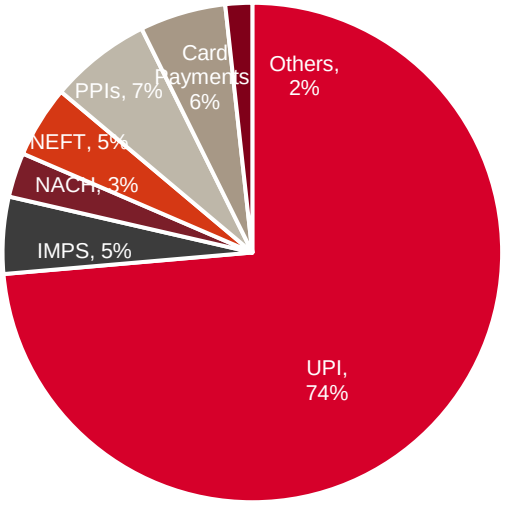
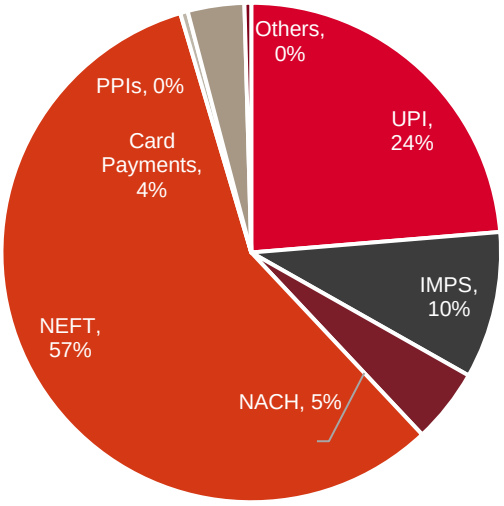
Note: Retail digital payments include all digital payments except RTGS and Paper Clearing; Source: RBI, CRISIL MI&A Research

Split of Retail digital payments (FY20)

Transaction volume – 33.9 billion	Transaction value – Rs. 308 trillion
	

Source: RBI, CRISIL MI&A Research

Split of Retail digital payments (FY23)

Transaction volume – 113.7 billion	Transaction value – Rs. 587.4 trillion
	

Source: RBI, CRISIL MI&A Research

On January 1, 2021, the RBI launched a composite Digital Payments Index (DPI) to capture the extent of digitization of payments across the country with March 2018 as the base period. The index comprises of five major parameters to measure the penetration of digital payments. These include payment enablers, payment infrastructure – demand side factors, payment infrastructure – supply side factors, and payment performance and consumer centricity. Each of these parameters have certain sub-parameters, which in turn consists of various measurable indicators.

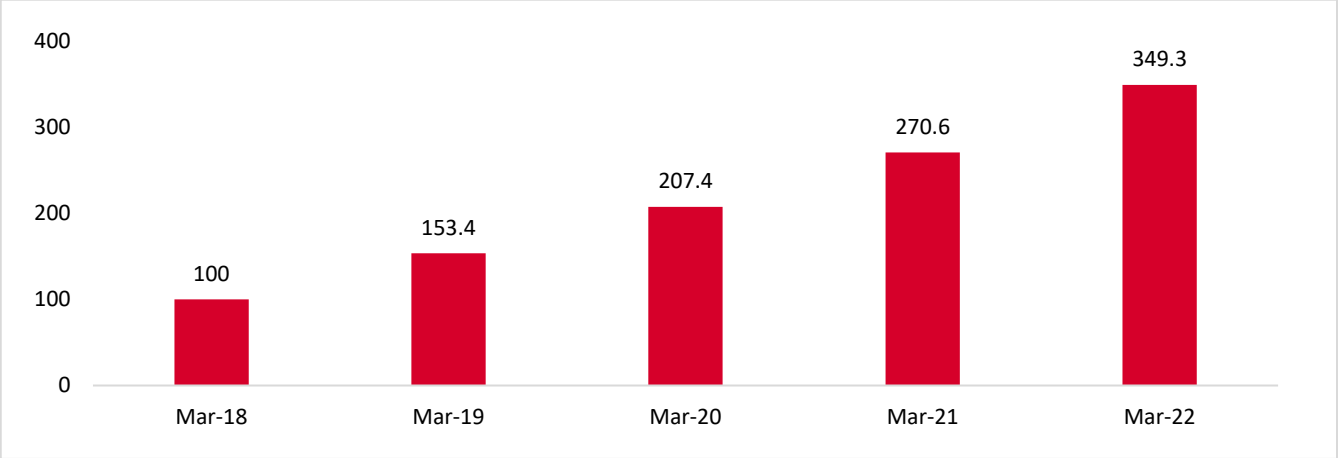
Parameters and Sub-parameters of RBI's Digitals Payment Index

Parameters	Sub Parameters	Parameter Weightage
Payment Enablers	Internet, Mobile, Aadhaar, Bank accounts, Participants, Merchants	25%
Payment Infrastructure – Demand Side	Debut cards, Credit cards, PPIs, FASTag, Customer registered in Mobile and Internet Banking	10%
Payment Infrastructure – Supply Side	Bank branches, Business Correspondents ATMs, POS Terminals, QR codes, Intermediaries	15%
Payment Performance	Digital payments system – Volume and Value, Unique users, Paper clearing, Currency in circulation, Cash withdrawals	45%
Consumer Centricity	Awareness and Education, Declines, Complaints, Frauds, System Downtime	5%

Source: RBI, CRISIL MI&A Research

The RBI and government have been continuously pushing for digital transaction over the years to bring in more transparency and reduce the cost of transactions; the launch of DPI is a significant step to measure to progress on this front. The DPI score for March 2018 is set at 100 and it was found to reach 207.4, 270.6 and 349.3 in March 2020, March 2021 and March 2022 respectively which shows the growth in digital payments.

Digital Payments Index



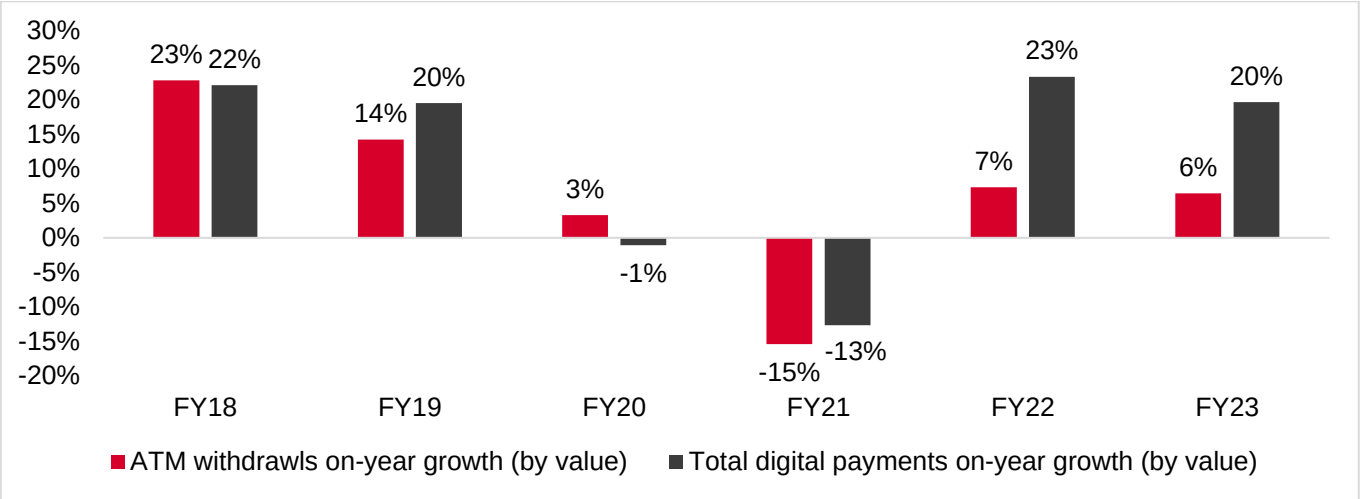
Note: Indexed to 100 as of March 2018; Source: RBI, CRISIL MI&A Research

Digital payments continue to rise, but so does ATM withdrawals

While digital payments are rising, cash usage in the economy remains high as evident from the graph below that captures on-year digital payments and ATM withdrawals growth. The value of withdrawals from ATMs has reached ~Rs. 33 trillion in FY23, up from ~Rs. 31 trillion in FY22.

While digital payments are increasingly becoming popular, cash also remains a significant mode of doing day-to-day transactions, especially in semi-urban and rural areas. The lack of trust in technology, limited awareness, inadequate payment infrastructure, and poor network connectivity has restricted digital transactions and discouraged people from using these payment modes. As a result, cash is still a preferred mode of payment in rural India due to comfort in transacting through cash. Furthermore, public preference has shifted to withdrawing cash on an as-needed basis instead of making large withdrawals at storing cash at home. Deposits with banks have also swelled over the last couple of years, which is reflected in the rise in currency in circulation.

Total digital payments and Cash transaction are both on the rise



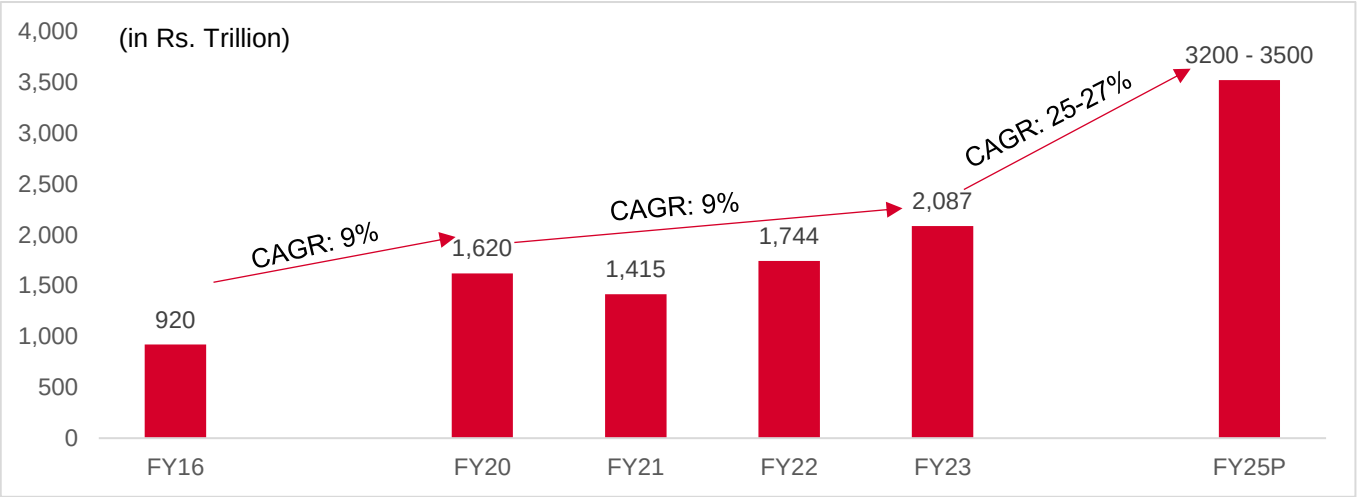
Source: RBI, MOSPI, CRISIL MI&A Research

Retail digital payments forecast to grow at 25-27% CAGR during FY23 to FY25

CRISIL MI&A Research forecasts the digital payments value in India to reach Rs 3,200-3,500 trillion in fiscal 2025 from Rs 2,087 trillion in FY23, translating into CAGR of 25-27% between fiscal FY23 and FY25. The growth in the digital transaction can be attributed to rise in smart phones and mobile internet adoption, convenience offered by digital payments, and ubiquitous availability of payment solutions. Players in the ecosystem as also regulators are continuously evaluating various technology options to come up with cost-effective solutions as well as multiple use cases in order to keep the two parties at the centre of the payment ecosystem – merchants and customers – engaged.

During the same time, retail digital payments is expected to double and reach Rs. 1,100-1,200 trillion by FY25, translating into a 42-45% CAGR growth over the next two fiscals. CRISIL MI&A Research expects regulatory environment to largely favour a nudge towards digital payments and incentivising it, which will lead to faster adoption of digital payments by the consumers, thereby driving growth of retail digital transactions in the time to come.

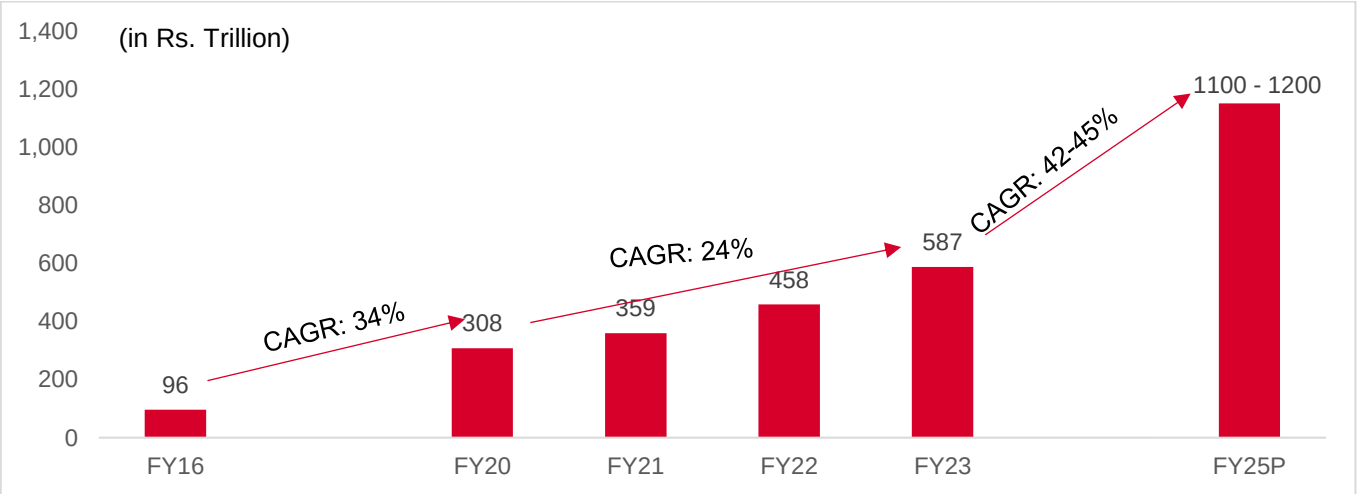
Digital payments value to reach around Rs 3,500 trillion by FY25



Note: Digital transactions includes Retail Electronic Clearing, PPIs, RTGS – excluding interbank clearing, ECS, NEFT, IMPS, UPI, Mobile Banking, NACH & card transactions at ATMs, P: Projected

Source: RBI, CRISIL MI&A Research

Retail digital payments value to double; to reach Rs 1,100-1,200 trillion by FY25



Note: Retail digital payments include all digital payments except RTGS and Paper Clearing; P: Projected

Source: RBI, CRISIL MI&A Research

Share of retail digital payments to grow at a faster pace

Year	Retail digital payment- Transaction Value	Retail digital payments as a % of overall digital payments
FY16	Rs. 96 trillion	10%
FY20	Rs. 308 trillion	19%
FY22	Rs. 587 trillion	28%
FY25P	Rs. 1,100-1,200 trillion	35-39%

Note: P: Projected, Retail digital payments include all digital payments except RTGS and Paper Clearing
Source: RBI, CRISIL MI&A Research

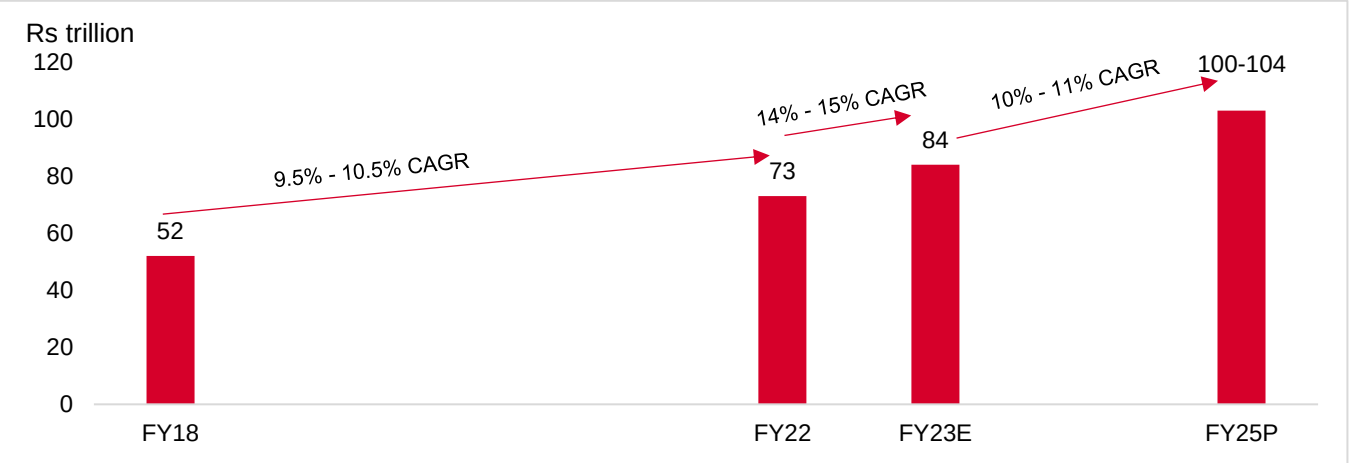
Enablers for growth in digital transactions

In India, the Central bank has been the primary enabler of digital transactions in India. Over the years, it has laid emphasis on the development of digital payment ecosystem, right from conceptualisation to execution and propelling investments in technology to enable the customer to transact in a seamless manner while addressing security concerns. This, along with rising internet penetration, increasing usage of cards, acceptance and adoption of various payments infrastructure and e-commerce platforms and changing consumer behaviour is expected to enable and drive digital transactions in the country.

Continuous rise in retail spending on goods

Retail spending on goods and services in India has grown at a 4-year CAGR of 10% between fiscal 2016 and fiscal 2020. But, in fiscal 2021, retail consumption saw a hit due to the implementation of nationwide lockdown. However, retail spending gradually recovered in fiscal 2022 and fiscal 2023, on account of low base, full year of store operations and waning impact of the pandemic. In the long run, retail spending is expected to reach Rs. 100-104 trillion by fiscal 2025, contributing to the digital payment growth in the country.

Overall retail spending to grow at ~10-11% CAGR between fiscal 2023 and fiscal 2025.



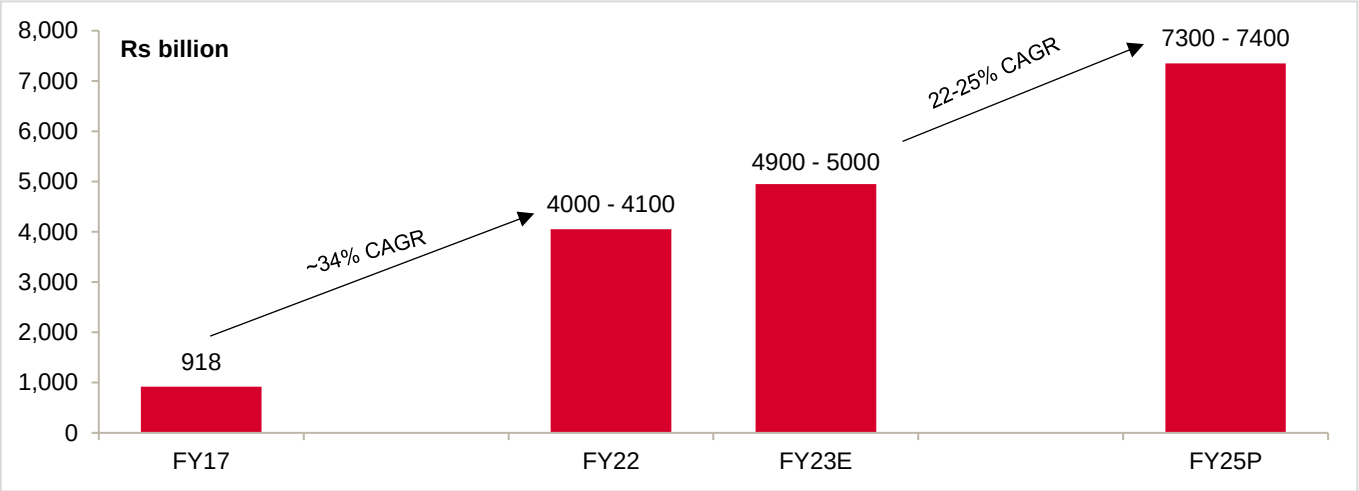
Note: P: Projected
Source: CRISIL MI&A Research

Ecommerce spending to drive digital transactions

The Indian e-commerce sector has had a phenomenal run in the recent past. The sector has managed to attract consumers and has grown at a ~34% CAGR from Rs. 0.9 trillion in fiscal 2017 to Rs. 4.0 - 4.1 trillion in fiscal 2022 on the back of rising internet penetration, increasing awareness of online shopping, penetration into tier 2 and tier 3

with the help of assisted model (where e-commerce firms tie up with merchants to cater customers) and lucrative deals offered by well-established players and start-ups. Going forward, CRISIL MI&A Research expects e-retail sector to grow at a CAGR of around 22%-25% between fiscal 2023 and fiscal 2025 to reach close to Rs 7.3-7.4 trillion by fiscal 2025, which will necessitate the growth of digital payments in the country.

E-retail continue to grow at a CAGR of 22%-25% between fiscal 2023 and fiscal 2025

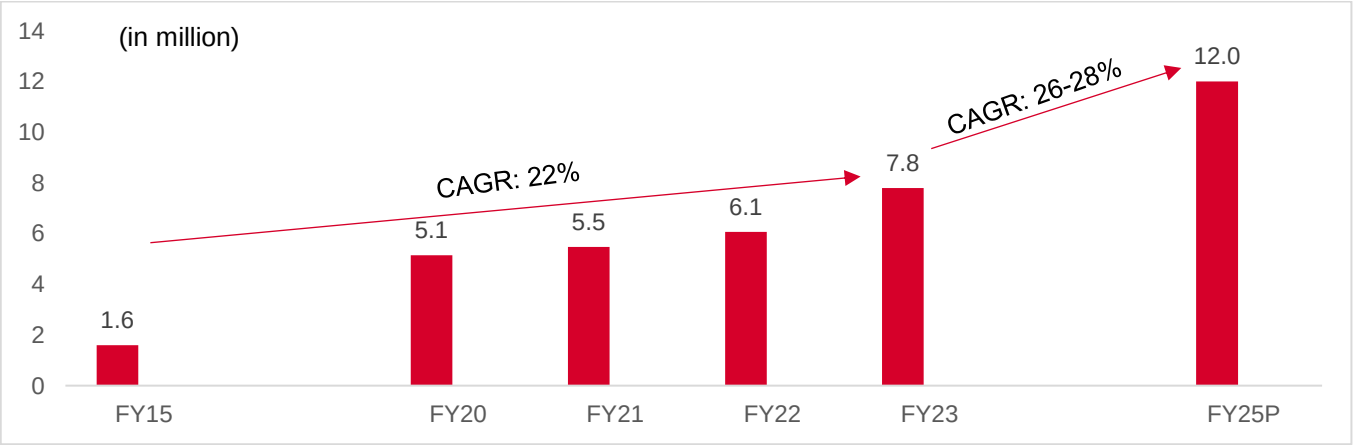


Note: P: Projected; Source: CRISIL MI&A Research

Increase in cards and POS terminal to augment digital transactions

Over the last decade, the usage of debit and credit cards in India has increased substantially. Between fiscal 2011 and 2023, the number of debit cards issued in the country has increased from 230 million to 961 million, while issued credit cards has increased from 20 million to 85 million. As more cards are getting issued, there has been a growth in the acceptance infrastructure as well. As of March 2023, the POS infrastructure in the country registered a 22% CAGR over the past 8 years to reach 7.8 million terminals. CRISIL MI&A Research expects this trend to continue, resulting in an increase in digital transactions.

Deployment of POS terminals to continue to reach ~12 million by FY2025

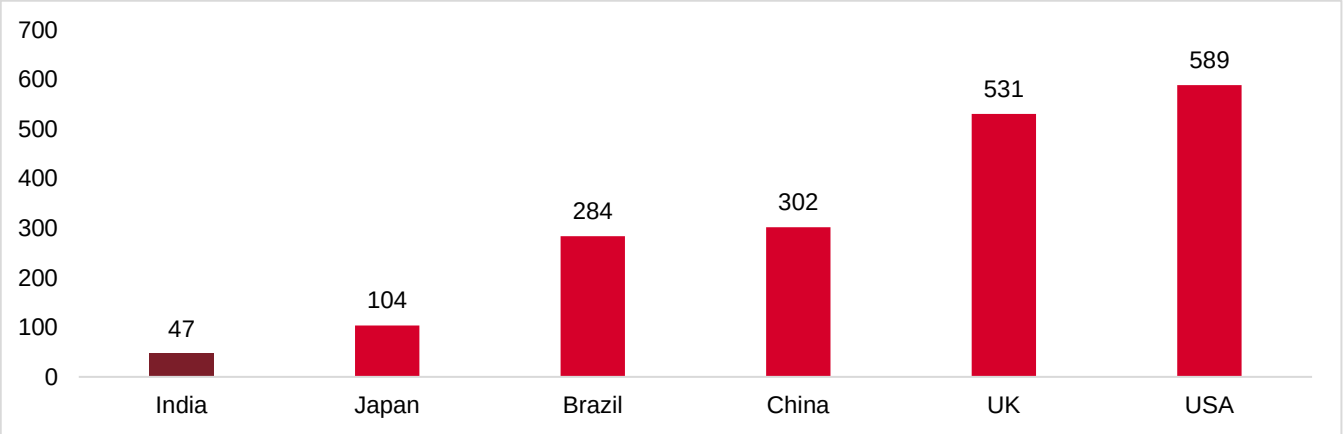


Note: P: Projected;
Source: RBI, CRISIL MI&A Research

Low penetration of per-capita digital payments transactions

According to Bank of International Settlements (CY2021), non-cash payments transactions volume per capita in India is the lowest compared to other countries, which presents a strong headroom for growth. The government has taken multiple initiatives to give a fillip to digitalisation in the country. This includes biometric identification of all Indian citizens through the Aadhaar programme, financial inclusion initiatives, launch of UPI and other digital payment systems and giving a push to online tax filings.

Number of non-cash payments transactions per capita, per annum (CY 2021)



Source: Bank of International Settlements, CRISIL MI&A Research

Products like contactless and digital cards to enable greater digital transactions

Introduction of contactless cards has enabled users to just tap and pay for transactions under Rs 2,000 by using the card at a contactless payment machine. Payment service providers are exploring innovative payment infrastructure by leveraging host card emulation (HCE) for secure near field communication (NFC) payment transactions. This will enable customers to easily use their cards on their NFC enabled smartphones to make contactless payments. The card issuers are also innovating and have introduced digital or virtual cards in the last one year. The digital card arrives in the individual's mobile application and has features like Touch ID or Face ID for authentication, which increases the convenience of transactions on e-commerce and other platforms. Further, significant growth in users over the last decade for payment apps and wallets such as PayTM, MobiKwik, and PhonePe are also enabling digital transactions in the ecosystem.

Regulatory moves to also spur gradual shift from cash to digital payments

DFS lies at the heart of financial inclusion in India. Despite the government's effort to create interconnected digital infrastructure, the adoption of DFS, especially in rural India, is marred by digital literacy, which has a direct impact on the acceptance of digital products. The lack of trust in technology, limited awareness, inadequate payment infrastructure, and poor network connectivity has restricted digital transactions and discouraged people from using these payment modes. As a result, cash is still a preferred mode of payment in rural India. In the past, lack of documents has been a big deterrent in weaning rural customers away from traditional banking services. However, AePS has helped address this and rural citizens are now carrying out basic digital transactions using their biometric ID and AADHAR.

In August 2020, RBI released a document setting out the framework to adopt and authorize the establishment of new umbrella entities (NUEs) for retail payments and open the channels to private sector players. According to RBI, setting up of NUEs will address the concentration risk (with NPCI), complement and supplement NPCI's work and enable new innovations to come out at a much faster rate, which will help get more and more people into digital payments. Going forward, CRISIL MI&A Research expects that with the help of NUE, multiple use cases will emerge to fill the void in the India payment space and fasten the adoption of digital payments in India.

In January 2021, RBI announced the creation of Payment Infrastructure Development Fund (PIDF) to boost digital payments in Tier 3 cities to Tier 6 cities. PIDF has a corpus of Rs. 3.45 billion, of which Rs. 2.5 billion is from RBI and the remaining from authorised cards networks in India. This fund will be used to subsidize banks and non-banks for deployment of payment infrastructure for those merchants, who still doesn't have access to POS machines. This move is also expected to encourage deployment of point-of-sale infrastructure, improve digital payments and provide better access of financial services in under penetrated or unpenetrated areas.

Apart from the in rural and semi-urban regions and rising competition among players is expected to fasten the shift from cash to a digital payment:

- **Sustained push from the Banks and FIs:** As legacy system age, they become more expensive to maintain, with fewer resources to ensure stability. Cash handling infrastructure thus becomes a burden for financial institutions, especially for low value transactions. Hence, fintechs along with banks are now focusing on payments convergence so that costs related to cash may be eliminated, when tapping into new markets. This push will also drive digital transactions as the customers will use reliable technology solutions offered by banks on their own platform or other dedicated platform obtained through collaboration.
- **Targeted campaign to increase customer awareness:** A large section of the Indian population, especially in the smaller cities and rural areas, is simply not aware of digital payments. A targeted campaign to showcase the benefits of digital payments for merchants and consumers alike, even in a small way, could help boost adoption.
- **Increasing competition:** The first wave of adoption of digital payments was driven by ease of transactions and seamless user experience. However, going forward, competition amongst different players to capture market share through various allied services will lead the next wave of growth in digital transaction.

Offline payments mechanism to drive the push for digital transactions

While payment companies have been acquiring merchants and pushing them to move to digital payments platform, the RBI is prodding payment companies to develop offline solutions to help overcome network constraints, which has inhibited the spread of digital transactions particularly in rural areas. Offline payments are transactions that are either processed without a data connection or where the transaction is recorded offline and processed at a different point of time. In the offline mode using cards, the card details of the transaction are stored at the terminal which is used to generate a transaction response for receipt. Later, when the internet connection is established, the stored payment data is processed. Currently, NPCI has one such product – Unstructured Supplementary Services Data (USSD) in its repertoire, which allows non-internet based mobile devices (smartphones as well as basic mobile phones) to avail banking service by dialling option (*99#). But the product has not garnered traction, with just around Rs 2 billion worth of transactions being recorded in fiscal 2023.

In August 2020, the RBI proposed to allow a pilot scheme for small value payments in offline mode with built-in features for safeguarding the interest of users. Under this scheme, authorised Payment System Operators (PSOs) – banks and non-banks – were allowed to provide offline payment solution using cards, wallets, or mobile devices for remote and proximity payments. Post the pilot scheme, the Central bank will decide on formalising the system based on the experience gained.

RBI directives on Digital payments security controls

While digital payments offer ease of transactions as well as convenience to end users, as with any other payment system, the bedrock on which the long-term sustainability of digital payments would stand will be security.

In the wake of rising concerns over digital fraud and data theft, the RBI, in February 2021, unveiled a new set of rules for enhancing digital payment security controls. These guidelines specify security protocols to be adopted in internet banking, mobile applications and cards issued by banks, payment banks, SFBs, and card-issuing non-bank lenders. The guidelines are intended to come into effect within six months. Some of the directives of RBI include:

- For mobile applications, where the service and authentication tools such as one-time-password are received on the same device, the players are required to come up with better alternatives to authenticate a transaction.
- Reconciliation process of transactions must follow a near-real-time framework, which would ensure that all stakeholders are provided necessary information within a 24-hour time period.
- The web pages of the lenders, which provide digital payment products and services, should not store customer sensitive information in HTML fields, cookies, or any other client-side storage.
- The lenders must have a specific section on their digital payment products and services which clarify how customers can lodge complaints in the event of a grievance.
- The applications or web pages provided by the lenders must have a mechanism to mark a transaction as fraudulent for seamless and immediate notification to the lenders.
- In addition, the RBI has mandated that except for card issuing banks, NBFCs and payment banks, no online company or payment aggregator will be allowed to maintain credit or debit card details in their databases for remote transactions. This would impact one click checkout and recurring billing transactions as card holders would be required to enter their credentials each time, they initiate a transaction instead of just confirming their three-digit card verification value (CVV) code as they do today.

After chip and PIN-based cards became commonplace for debit and credit cards, identity theft and payment fraud at physical point-of-sales has increasingly become more difficult, and by now turning its focus to online payment frauds, it appears that RBI is laying the ground for tokenisation or some other form of encryption technology.

Digital payment instruments

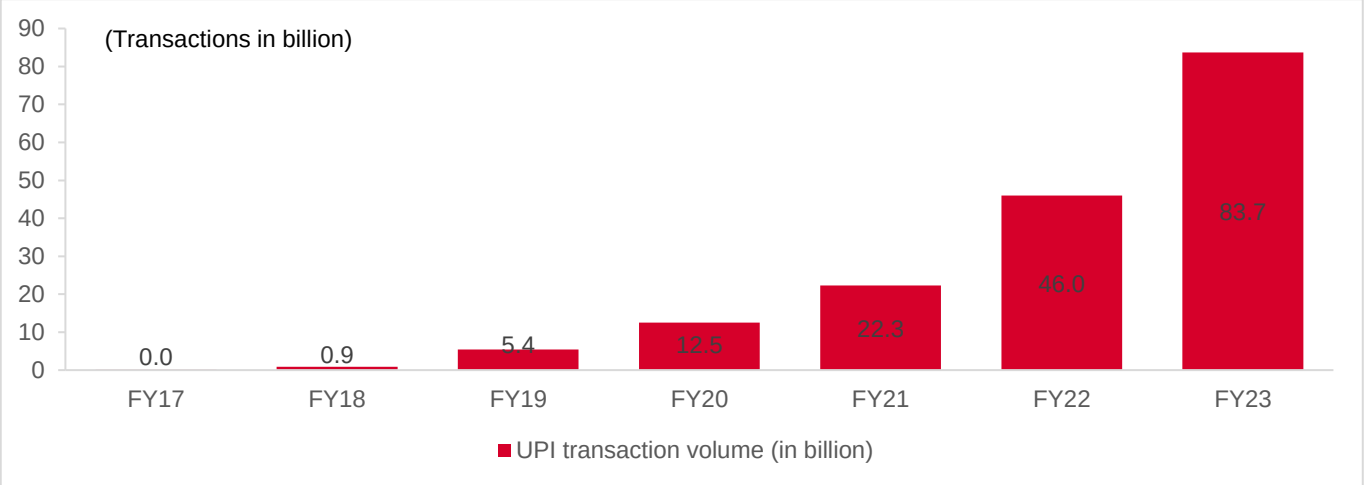
Unified Payment Interface (UPI)

UPI is a mobile based payment system, wherein users can send and receive money instantly using a Virtual Payment Address (VPA). The unique feature of VPA-based transaction is the secure aspect of UPI architecture as it obviates the need for sharing account or bank details to the remitter. It supports person to person (P2P) and person to merchant (P2M) payments and can be used over smart phone (app based), feature phone (USSD based) and at merchant location. Since its launch in 2016, UPI, has witnessed an exponential growth in terms of volumes to reach 83.7 billion in fiscal 2023 from 0.02 billion in fiscal 2017. Similarly, the value of transactions has increased from Rs. 0.07 trillion to reach Rs. 139 trillion between fiscal 2017 and fiscal 2023. The outbreak of Covid-19 was a minor blip

in the growth story as transactions saw a minor drop in early months of FY20-21; however, the shift towards digital transactions through the UPI platform has seen an acceleration since then.

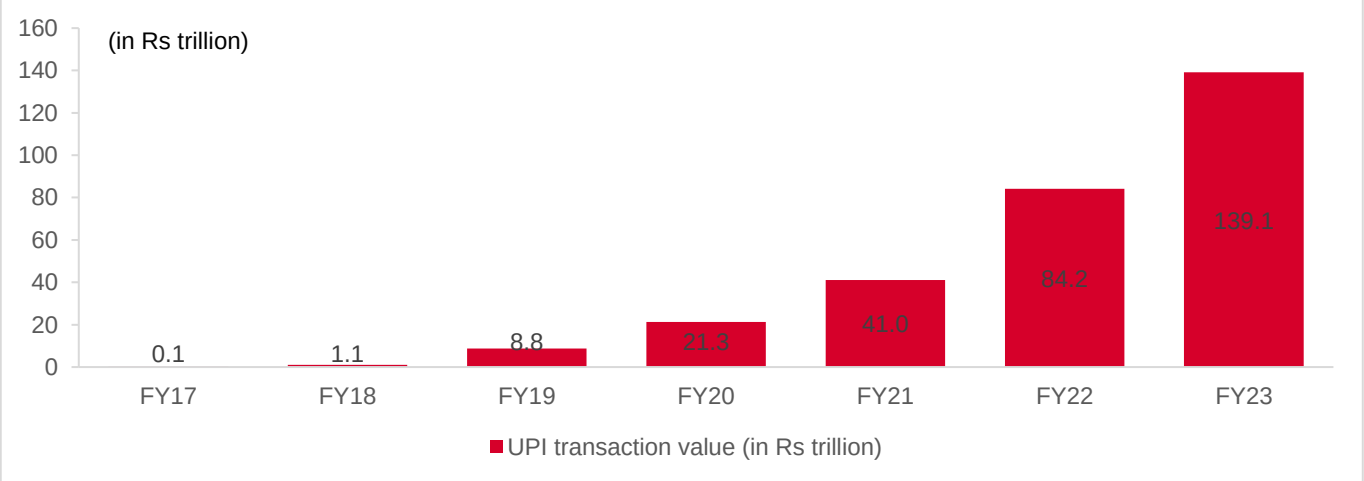
The launch of UPI 2.0 in 2018 saw expansion of its use cases. Invoice verification, linking of overdraft account, additional security through signed intent and QR code were some of the features that were introduced. In July 2020, NPCI also allowed customers to set a recurring mandate with UPI to pay for mobile bills, EMIs, insurance premiums and make mutual fund investments. This is expected to provide a major push to the volumes and revenue of UPI transactions. The government has also mandated a zero-merchant discount rate (MDR) for all domestic UPI transactions. CRISIL MI&A Research thus expects that with new payment technologies and increasing use cases across sectors, the growth momentum of digital transaction is expected to continue.

UPI transactions volumes have zoomed between FY17 and FY23



Source: RBI, CRISIL MI&A Research

UPI transactions value continue to rise with surge in volumes



Source: RBI, NPCI, CRISIL MI&A Research

Bharat Bill Pay Service

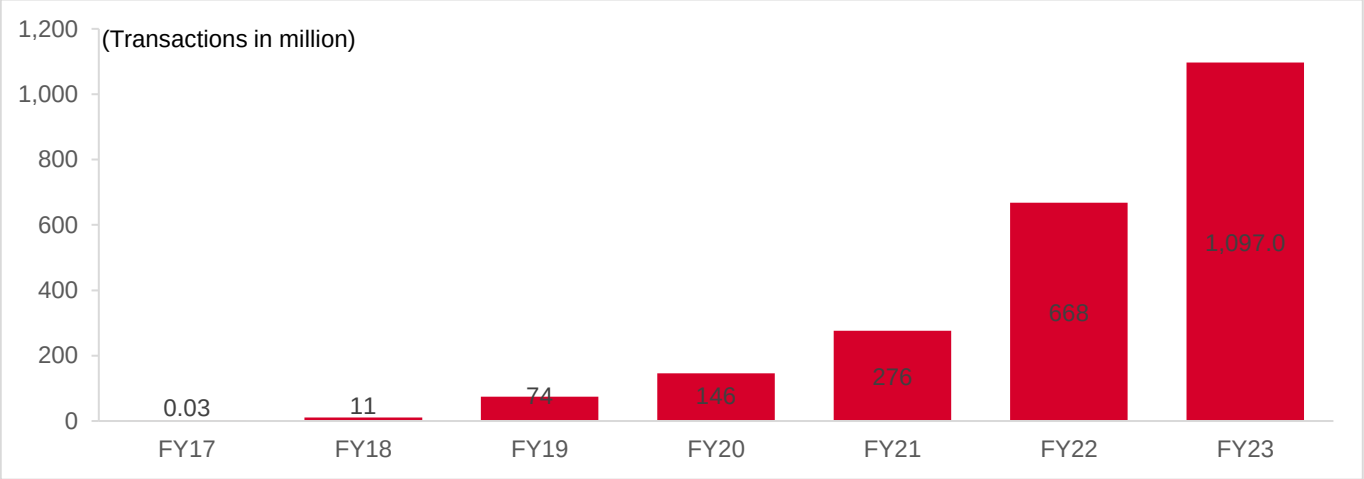
Bharat Bill Pay to grow with expansion of new billing categories

Bharat Bill Payment system is a Reserve Bank of India (RBI) conceptualised system driven by NPCI. It is a one stop ecosystem for payment of all bills providing an interoperable and accessible “Anytime Anywhere” bill payment service to all customers with certainty, reliability and safety of transactions. If offers myriad bill collection categories like

electricity, telecom, DTH and other utility payments. It also offers repetitive payments like insurance premium, mutual funds, credit cards etc. The emergence of Covid-19 has accelerated the digital payment landscape and we have seen a surge in volume of transaction through BBPS. In FY23, BBPS transaction volumes and value increased by 64% and 67% respectively from fiscal 2022 level to reach 1,097 million transactions amounting to Rs. 1,907 billion.

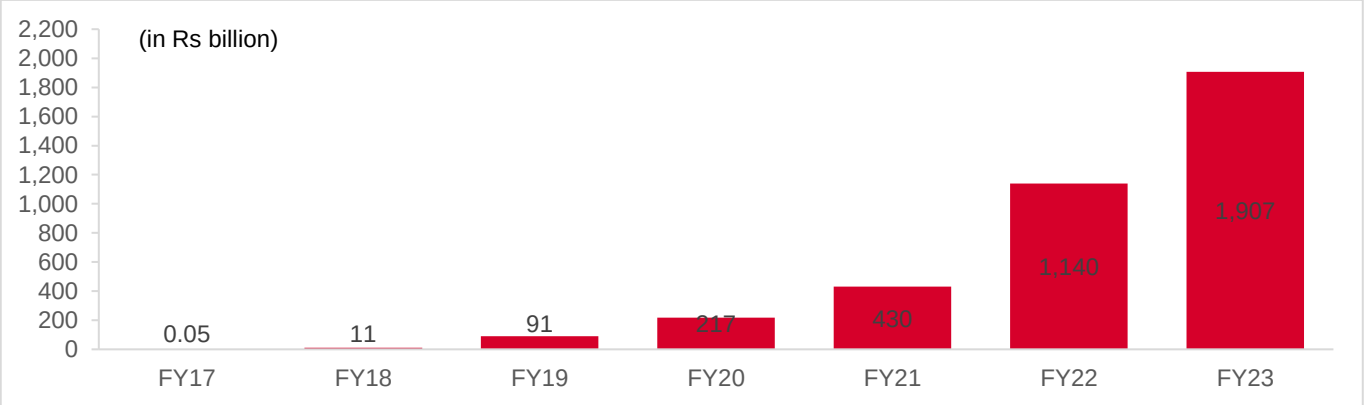
Going forward, revival of commercial activities, improvement in consumer spending, continued on boarding of new billers under existing categories and addition of new biller categories is expected to bring additional transaction volumes. Banks and other mobile application are also integrating their customer facing interface and system to support BBPS which will also aid growth for BBPS. CRISIL MI&A Research believes that the consumers who shifted to online mode of bill payment due to Covid-19 will continue to use online mode of payments, going forward. In addition, CRISIL MI&A Research expects increasing internet and smart phone penetration will also drive transactions from the rural customers, who will use the platform to make utility bill payments.

Increasing internet and smartphone penetration to drive transaction volume for BBPS



Source: NPCI, CRISIL MI&A Research

Rising transaction volumes augmented transaction value for BBPS



Source: NPCI, CRISIL MI&A Research

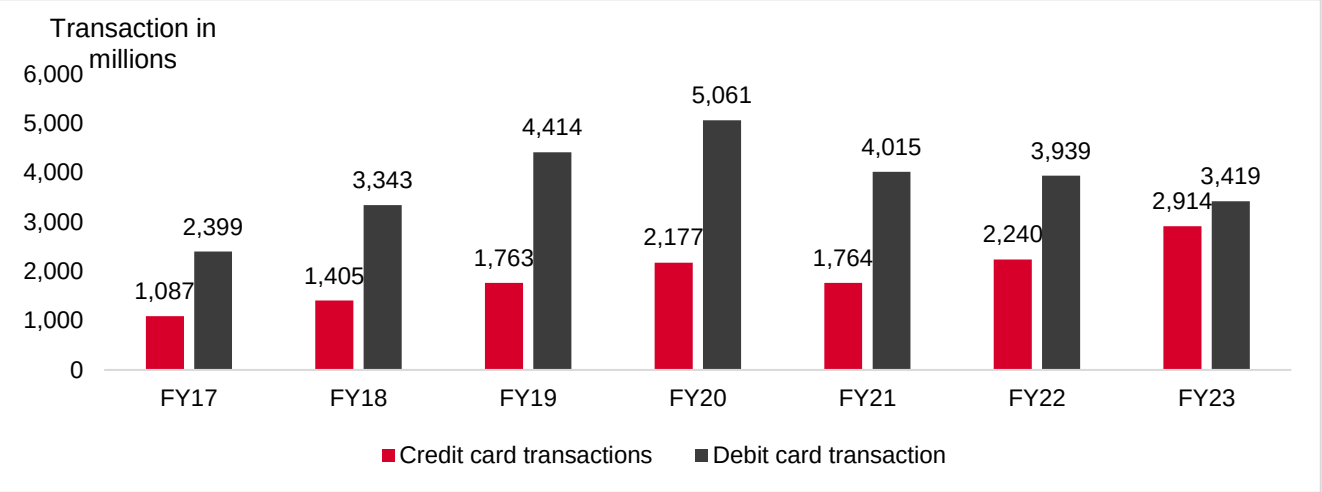
Credit and Debit cards

Cards spends increased by more than three times during fiscal 2017 to fiscal 2023

Credit card and debit cards spends have registered a robust growth of 28% and 14% CAGR over a period of 6 years to reach Rs 14.3 trillion and Rs. 7.2 trillion respectively in fiscal 2023. The transaction volume during the same time has increased at CAGR of 18% and 6% for credit card and debit card respectively. The government's emerging vision

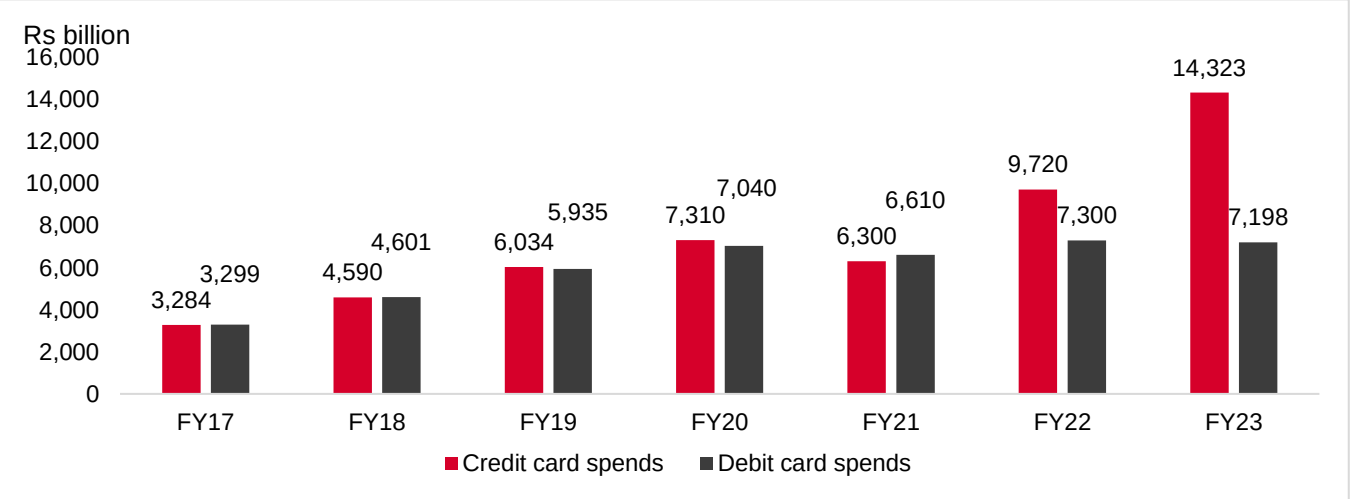
of a cash-less society, focus on digitalisation, developments in e-commerce, and availability of point-of-sale infrastructure have significantly encouraged payments through credit and debit cards.

Credit Cards transaction volumes recovered after a dip in fiscal 2021



Source: RBI, CRISIL MI&A Research

Credit card & debit card spends grew at 28% and 14% CAGR respectively between fiscal 2017 and 2023



Source: RBI, CRISIL MI&A Research

Prepaid payments instruments (PPIs)

PPIs are instruments that facilitate purchase of goods and services, remittance facilities etc. against the value stored in such instrument. These instruments have been in the market since 2002, but its usage has been limited to gift cards, foreign exchange cards and meal cards (Eg: Sodexo cards) for general usage. The usage of PPIs became more prevalent after December 2019, when a new type of PPI was launched which can be loaded/re-loaded from a bank account/credit card and can be issued based on essential minimum details obtained from the customer. Interoperability was also allowed amongst the PPIs which provided the customers an option to use the card at various outlets without the need for multiple on-boarding at multiple issuers. While consumers have benefitted from this convenient payment option, the merchants have also adopted PPIs due to relatively lower cost associated in setting

up infrastructure and processing pa/yments. PPIs thus witnessed a growth of 39% CAGR in terms of volume and 30% CAGR in terms of transaction value between fiscal 2016 and fiscal 2023.

In April 2021, RBI proposed to make interoperability mandatory for full KYC PPIs and for all acceptance infrastructure and also allowed cash withdrawals from full KYC PPIs. In order to incentivize the migration of PPIs to full-KYC, the RBI also increased the upper limit that customers can store in PPIs from the earlier level of Rs. 1,00,000 to Rs 2,00,000. In addition, PPIs will also have access to NEFT and RTGS channels. While these measures are expected to enhance the functionality of wallets, the requirement of full KYC may continue to limit the uptake of PPIs. Players also will have put in place appropriate incentives and use-cases to propel PPI adoption.

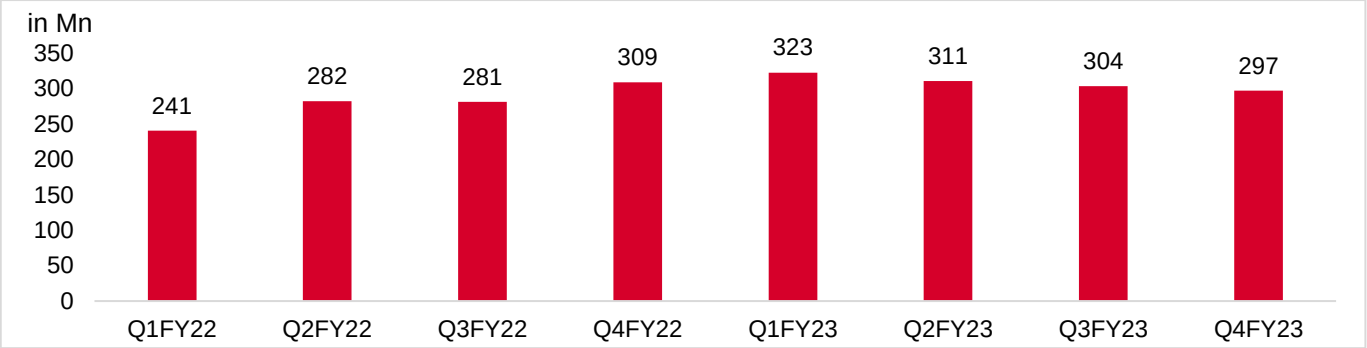
RBI's measures to enhance the functionality of PPIs

Source: CRISIL MI&A Research

AADHAR Enabled Payment System (AePS)

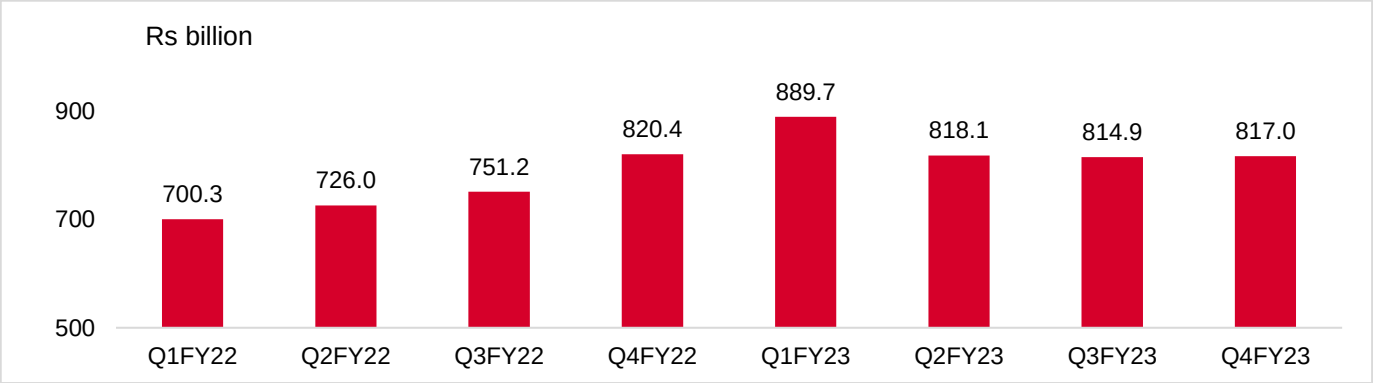
AADHAR Enabled Payment System (AePS) is a bank led model that uses AADHAR authentication to allow interoperable transactions at POS terminals. It was launched with an objective to facilitate banking services in the underbanked regions of the country. Since its launch in 2016, AePS has seen a strong growth in its transaction volume and value. Post-Covid, the usage of AePS has jumped manifold, indicating the increasing convenience of this channel as also the change in customer behaviour.

Volume of AePS transactions



Source: RBI, CRISIL MI&A Research

Value of AePS transactions



Source: RBI, CRISIL MI&A Research

6.3 Banking technology solutions

API Landscape

An application programming interface (API) is primarily a development tool that essentially bridges a gap between digital services, thereby allowing one application to access information or capabilities of another. But, over the past few years, APIs have been elevated from a development technique to a business model driver. Organizations are increasingly using APIs to build an ecosystem involving various partners to unlock new value for their businesses. In order to leverage their strength, the APIs are now managed like a product – one built on top of a potentially complex technical footprint that includes legacy and third-party systems, which can be shared, reused and monetized to extend the reach of service providers and open up new revenue streams.

Evolution of API

The idea behind APIs has existed since the beginning of computing, however, in the last decade, its usage has grown significantly due to a fast pace of adoption of agile delivery models. This has put a higher emphasis on rapid experimentation to enable processing of transactions between different elements in the technology solution stack.

Evolution of APIs	Remarks
1960-1980	The era saw basic interoperability leading to programmatic exchange of information using simple network protocols. Example of some of these techniques include Advanced Research Projects Agency Network (ARPANET) and Transmission Control Protocols (TCP)
1980-1990	From simple transmission, the APIs were refined using interfaces, procedures etc. to build on the existing infrastructure and provide additional services which could allow remote interaction across different entities lying in different networks
1990-2000	Between 1990 and 2000, the industry saw middleware technologies which lies between the operating systems and applications running on it. The middleware allows communication and data management for distributed application. Some techniques which was predominantly used in this time were message oriented middleware and service oriented architecture.
2000- Present	In today's time, businesses build APIs to enable and accelerate new service development and offerings. During the last few years, we have seen the emergence of API economy and witnessed **software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS)** becoming an important mode for of delivering solutions. This is a cost-effective way for enterprises to use specific programmes and resources in a flexible or variable cost model rather than buy them outright and install them on their technology stack. In the same way as plug-and-play model has worked for software service providers, a plug and play banking equivalent – **banking as a service (BaaS)** is now evolving and doing so for financial services

Traditionally retail banks owned end-to-end service delivery by integrating experience, process, and products; however, this approach came under attack with the advent of fintechs which started to compete for customers by proving a superior user experience leveraging technology. This forced banks to rethink their business model – leading to an emergence of banking as a service.

A lot of established banks such as ICICI Bank and HDFC Bank today offer similar API banking services for fintechs, aggregators, merchants, third party service providers, direct selling agents (DSAs) and API developers to build various applications using their open API in areas of payments, customer servicing and sourcing. For instance, HDFC Bank offers APIs for NEFT and RTGS payments that enables external partners of the bank to perform payment

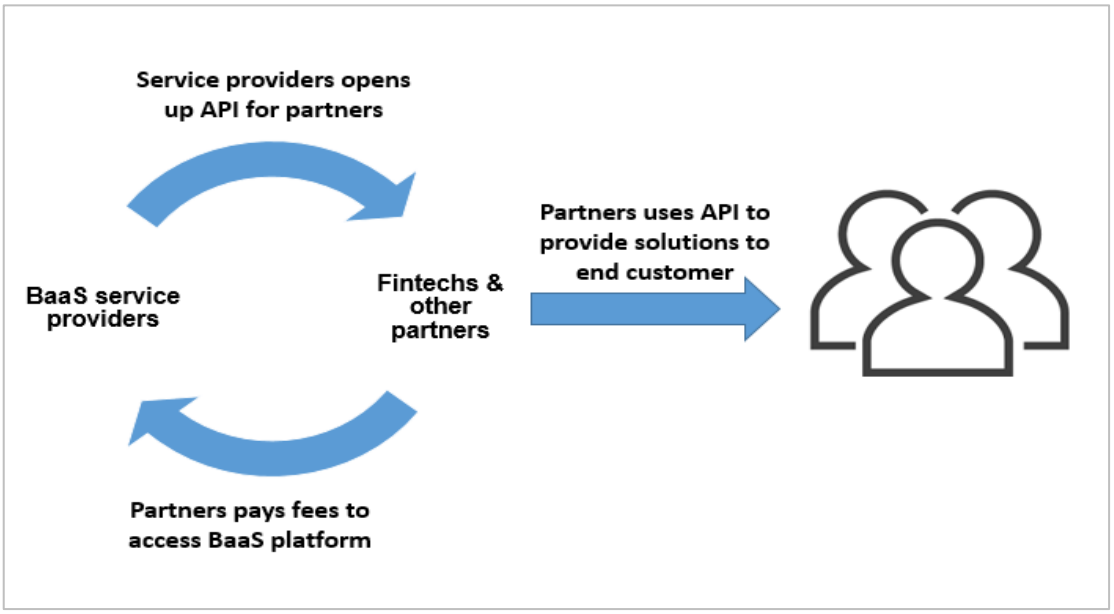
transactions. ICICI Bank offers an “EasyPay” payment API which allows institutions to collect money from their customers. It generates QR code for the merchant, receives money from the customer and updates the status of the transaction. These open banking integrations have also brought digital inclusiveness to smaller towns and rural regions and enhanced the awareness and relevance of banking services and products for rural India.

However, for larger banks, these APIs form a very small part of their revenue and are created with the objective of better connecting with their target customer base. Given the wide market expanse and the diversity of customer base, there exists considerable opportunity for players to work on new use cases targeting specific segments – for example, unbanked and underbanked segments. Fino Payments Bank, for example, offers APIs to business correspondents that enables them to provide services to their customers in semi-urban and rural areas in a cheaper and faster manner. YAP provides a bank-in-box service that enables digital platforms, fintechs as well as brick-and-mortar offline businesses to connect with other fintechs, public platforms such as UPI, licensed banks and NBFCs to offer specific solutions to their end-users.

Banking as a service (BaaS) model begins with a third-party service provider paying a fees to a financial institution, who opens its API to the new fintech/third party provider, thereby granting access to systems and information that will be necessary to build a new financial or banking product for the end consumer. This allows the financial institutions that launch their BaaS platforms to create new revenue streams which include charging clients a monthly fee for the platform and an additional variable cost based on the service used. The API ecosystem value chain has three participants:

- **API/BaaS Providers** – They choose which business assets to make available as an API, under what terms and conditions and what will be roles and responsibilities for the provider
- **API Consumer** – These involves the partners who under the designated terms and condition build on the existing API to enhance the experience on an existing product or make a new product available to the end user
- **End User** – The end user is someone who does not see the API, rather draws benefit by undertaking a transaction from the use of application that is provided

Banking as a service (BAAS) business model



Source: CRISIL MI&A Research

Beyond adding a new revenue stream arising out of sale of technology, developing a BaaS solution also allows financial institutions to establish relationships and forge partnerships with new fintechs and entities with emerging business models, thereby keeping themselves ahead of the trends. In addition, continuous development and enhancement of API also allows the service provider to react faster to the market changes through faster adoption of newer technology and reduce time to reach the market.

Relevance of API infrastructure providers in Indian context

The financial services ecosystem in India is undergoing a metamorphosis, given the rapid disruptions due to technology. On one hand, we are witnessing the emergence of large and specialised fintech players who are offering their services across multiple domains such as payments, credit, wealth management, insurance and broking. On the other hand, several businesses in consumer-facing segments are looking to provide financial solutions to their customers and suppliers. Given the extant regulatory environment, many of these businesses would require partnerships with licensed banks, NBFCs and fintech players to offer financial services to their customers. However, bandwidth constraints and lack of focus often inhibits the ability of larger entities to focus on such initiatives. It is here that the licensed banks offer their core banking solutions via the use of APIs to various fintechs and other partners, enabling them to provide differentiated products for specific use cases to their customers.

Growth Drivers

Focus on creating differentiated user experience to boost usage of APIs

The companies are employing responsive websites, interactive mobile applications and other user-friendly digital interfaces to enhance their interactions with customers. API capabilities allow the fintechs and other partners to implement newer ideas arising from design thinking for providing services such as payments, mobile wallets and collections. This ensures they are able to provide various services under a single platform to their customers, thereby enhancing the experience and also aiding in customer stickiness.

Newer business use cases and ease of access to drive growth for API providers

APIs enable companies to leverage the capabilities of other organizations, thereby reducing their cost of owning the technology and applying resources for maintenance. Continued growth of this asset light model to build businesses around APIs rather than rebuilding it from scratch will drive growth for the API service providers. Continued innovation and focus on development of new tools by API providers in areas of retirement planning, portfolio management and other such relevant use cases around their existing platform will also drive revenues for the API based service providers. API companies can also offer bundled and integrated offerings with different pricing options to their customers and allow them to avail features and benefits based on their business requirements.

To conclude, the rapid growth of APIs has been triggered by steps taken by various entities in this space to leverage the benefits of technology to offer low-cost banking solutions. Given the evolving context post Covid-19 pandemic, it is clear that technology will play a much larger role in financial services and adoption of newer technology will continue to increase through various partnerships between banks and fintechs as well as other consumer-facing entities. Essentially, APIs can provide the rails on which fintechs and other incumbents can build new-use cases keeping in mind their target customer segment. CRISIL Research believes that platform centric models, which run through APIs, will continue to gain traction with potential API customers preferring agile and asset-light business models, while enhancing focus on offering relevant solutions to customers.

7 E-Governance services in India

Initiatives taken by Indian government to further penetrate usage of e-governance

The “e” in e-Governance stands for ‘electronic’. E-Governance provides a platform to integrate solutions and services between Government to Government (G2G), Government to Citizens (G2C), Business to Business (B2B) and Government to Employees (G2E). E-Governance refers to the use by government agencies of information technologies that possess ability to transform their relations with citizens, businesses, and various arms of government resulting in better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resultant benefits are increased transparency, less corruption, greater convenience, revenue growth, and cost reductions.

The reason why countries around the world are increasingly opting for e-Governance is that governance has become more complex and varied in the last few decades and more importantly, citizens’ expectations from government have increased multiple times. Information and Communications Technology (ICT) facilitates efficient storing and retrieval of data, instantaneous transmission of information, processing information and data faster than the earlier manual systems, speeding up governmental processes, taking decisions expeditiously and judiciously, increasing transparency and enforcing accountability. It also helps in increasing the reach of government – both geographically and demographically.

Use of ICT in governance has reached a critical point. It is no supporting tool, nor does it represent a cure for government deficiencies or inefficiencies; it should be seen as an integral aspect of the physical functioning of public institutions and services delivery.

The United Nations Department of Economic and Social Affairs (UN DESA) has been publishing the EGDI and survey report since 2001 biennially. Over the past ten editions it has established itself as both a leading benchmarking reference on e-government, and a policy tool for decision makers.

The survey is the only global report assessing the e-government development status of all United Nations member states. This score is a relative measure of a country's e-government performance, rather than an absolute measure. Countries recognize the need to align the level and scope of their e-government initiatives with their development priorities and the achievement of their Sustainable Development Goals (SDGs). The research is primarily aimed at policy makers, government officials, academia, civil society, the private sector, and practitioners and experts in the fields of sustainable development, public administration, digital government, and ICT for development.

EGDI serves as a benchmarking and development tool for countries to learn from each other, identify areas of strength and challenges in e-government and shape their policies and strategies in this area.

Mathematically, the E-Government Development Index (EGDI) is the weighted average of normalised scores on the three most important dimensions of e-Government, namely:

- The Scope and quality of online services as online Service Index (OSI)
- The Status of the development of telecommunication infrastructure or the Telecommunication Infrastructure Index (TII)
- The inherent human capital or the Human Capital Index (HCI).

The Ministry of Electronics and Information Technology is working as a nodal Ministry for Monitoring of E-Government Development Index.

India's rank as per United Nations e-Government Survey

Year	Rank	EGDI Composite Score
2022	105th	0.5883
2020	100th	0.5964
2018	96th	0.5669
2016	107th	0.4637
2014	118th	0.3834

Source: Department of Economic and Social Affairs, United Nations E-Government Survey 2022

E-governance initiatives in India took a broader dimension in the mid-1990s for wider sectoral applications with emphasis on citizen-centric services. The major ICT initiatives of the Government included, inter alia, some major projects, such as railway computerization, land record computerisation etc., which focused mainly on the development of information systems. Later, many states started ambitious individual e-governance projects aimed at providing electronic services to citizens.

Though these e-governance projects were citizen-centric, they could make less than the desired impact due to their limited features. The isolated and less interactive systems revealed major gaps that were thwarting the successful adoption of e-governance along the entire spectrum of governance. They clearly pointed towards the need for a more comprehensive planning and implementation for the infrastructure required to be put in place, interoperability issues to be addressed etc., to establish a more connected government.

The national level e-governance programme called National e-Governance Plan (NeGP) was initiated in 2006. There were 31 Mission Mode Projects under National e-Governance Plan covering a wide range of domains viz. agriculture, land records, health, education, passports, police, courts, municipalities, commercial taxes, and treasuries etc. 24 Mission Mode Projects have been implemented and started delivering either full or partial range of envisaged services.

Considering the shortcomings in National e-Governance Plan that included lack of integration amongst Government applications and databases, low degree of government process re-engineering, scope for leveraging emerging technologies like mobile and cloud etc., the Government of India conceptualized 'eKranti' or NeGP 2.0.

All new and ongoing e-governance projects as well as the existing projects, which are being revamped, are in accordance with the key principles of e-Kranti namely 'Transformation and not Translation', 'Integrated Services and not Individual Services', 'Government Process Reengineering (GPR) to be mandatory in every MMP', 'ICT Infrastructure on Demand', 'Cloud by Default', 'Mobile First', 'Fast Tracking Approvals', 'Mandating Standards and Protocols', 'Language Localization', 'National GIS (Geo-Spatial Information System)', 'Security and Electronic Data Preservation'.

The portfolio of Mission Mode Projects has increased from 31 to 44 MMPs. Many new social sector projects namely Women and Child Development, Social Benefits, Financial Inclusion, Urban Governance eBhasha etc., have been added as new MMPs under e-Kranti.

The initiatives taken under digital India program are as follows:

Infrastructure	Services	Empowerment
Aadhar	Accessible India Campaign and Mobile App	Aadhaar Enabled Payment System (AEPS)
Bharat Broadband Network (BBNL)	Agri-market App	Business Process Outsourcing (BPO) Scheme
Common Service Centres (CSCS)	Beti Bachao Beti Padhao	DIGIDHAN Abhiyaan
	BHIM (Bharat Interface for Money)	MyGov
	Crime And Criminal Tracking Network & Systems (CCTNS)	National Mission on Education using ICT
	Crop Insurance Mobile App	North-East BPO Promotion Scheme (NEBPS)
	Digital AIIMS	NREGAsoft (National Rural Employment Guarantee Act)
	E-Granthalaya	OpenForge
	E-Panchayat	PAHAL (Pratyaksh Hanstantrit Labh) Direct Benefits Transfer for LPG (DBTL)
	Entrepreneurship and Business Incubation Zone (eBiz)	PayGov India
		Pradhan Mantri Gramin Digital Saksharta Abhiyaan (PMGDISHA)
		Pradhan Mantri Jan-Dhan Yojana (PMJDY)
		Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
		Smart Cities
		Targeted Public Distribution System (TPDS)
		Visvesvaraya PhD scheme for Electronics and IT

Source: Digital India website

Major trends in global e-governance space

Governments all over the globe are making efforts towards the full digitalization of government services, giving users the ability to complete virtually all types of transactions entirely online. At global level, e-governance development has seen an uptick which is largely attributable to the progress made in strengthening telecommunications

infrastructure and developing human capital. Countries in Africa have made significant improvements in their telecommunications infrastructure, building a robust foundation for accelerating the transition to digital government. Challenges remain, however, as the cost of mobile broadband subscriptions as a percentage of per capita gross national income remains significantly higher in Africa than in other parts of the world.

While advancement in e-government development remains strongly correlated with national income, there are some notable exceptions which indicates that income level of the country matters but is not the sole factor determining the level of e-government development. High-income countries have already reached a relatively high level of services provision, whereas low-income and lower-middle-income countries lack sufficient resources for investment in the development of online services. Low-income countries struggle with investing in human capital development which restricts the overall penetration of e-governance.

Driven by the COVID-19 pandemic, government priorities in online services provision have centred on health, education, and social protection. Countries are providing a wide range of online services to address the Covid-19 pandemic, offering information and tools that facilitate distance learning, telehealth services, and the scheduling of vaccines and medical tests. The sharpest increase in online services provision has been in the area of social protection; with governments making efforts to build web national portals that allow users to apply for benefits such as maternity care, child subsidies, pensions, housing, and food allowances.

A growing number of countries have strengthened their institutional and legal frameworks for e-government development. Most countries have a national electronic or digital government strategy, as well as legislation on cybersecurity, personal data protection, national data policy, open government data, and e-participation. Individuals and businesses are increasingly able to interact with public institutions through online platforms, obtain information on legislation relating to freedom of information, and access public content and data (including open government data). More Governments are seeking and responding to user feedback and are working to tailor services to people's needs. However, proactive engagement in public e-consultations on important policy issues remains limited.

Most countries have taken effort to build "one-stop-shop" portals for the online provision of different government services.

Business-related services such as registration, licensing and filing company taxes are among the five government services offered most frequently. The next most offered online services include applying for government vacancies and business licences, requesting birth, death, and marriage certificates, and paying utility bills.

The number of countries providing information and services through smartphone applications, SMS and/or mobile browsers has been rapidly increasing. The health sector saw the most significant increase, largely owing the widespread adoption of digital solutions in response to the Covid-19 pandemic, but growth was also evident for the justice sector, the education sector, and the social protection sector

To summarise, progress is being made in e-government development by the countries globally at a mild pace. The Covid-19 pandemic has heightened the importance of digital transformation, not least because Governments must be able to deliver public services despite restrictions on physical interaction and to reach remote, marginalized, vulnerable and other underserved populations so that no one is left behind. Countries that are already at a more advanced stage of e-government development tend to perform better in public services delivery than those with resource limitations or underdeveloped telecommunications infrastructure and human capital development.

Performance of countries provisioning government services online

Mathematically, the E-Government Development Index (EGDI) is the weighted average of normalised scores on the three most important dimensions of e-Government, namely:

- The Scope and quality of online services as Online Service Index (OSI)
- The Status of the development of telecommunication infrastructure or the Telecommunication Infrastructure Index (TII)
- The inherent human capital or the Human Capital Index (HCI).

The composite value of each component index is normalized to fall within the range of 0 to 1, and the overall EGDI is derived from taking the arithmetic average of the three component indices with 1 corresponding to the highest-rated member state in respective component and 0 to the lowest.

The OSI is further aligned with Local Online Service Index (LOSI) by categorizing the assessment questions into 5 discrete thematic areas forming 5 subindices: services provision (SP), e-participation (EPI), institutional framework (IF), content provision (CP), and technology (TEC)- with the OSI calculated based on the normalized values for each subindex. The weight of each thematic area is 45%, 35%, 10%, 5% and 5% respectively.

The services considered under service provision to arrive at local online service index are as follows:

Evidence of One-Stop-Shop portal(s) | E-procurement platform for bidding processes/submission of tenders | Service provision on Income taxes |Online provision for: Value Added Tax (VAT), Goods & Services Tax (GST) or equivalent | Apply online for: Visa to enter or transit | Registration or renewal for a: Vehicle (car, truck, motorcycle, and others) |Online declaration to the police | Notify of moving/changing an address online | Registration for a new company or business entity |Apply/request Birth certificates | Death certificates |Marriage certificates |Personal Identity Cards | Driver's license |Land title registration |Environment-related permits |Building permits| Business licenses| Apply for Government vacancy positions | Pay online for government fees or fines | Water utility |Energy(electricity/gas) utility |Digital invoices | provision of GIS or other geospatial related online services | Business tax filing | Mobile service provision available through i) smartphone apps; ii) SMS services; or iii) mobile browser (for health, education, employment, social protection, environment. justice) | Students can apply for government scholarships and fellowships programme | Users can apply for: Social protection programs | Services available to the following vulnerable groups: poor (below poverty line) /persons with disabilities /older persons / immigrants, migrant workers, refugees, and internally displaced persons / women /youth |Eligibility and/or procedure on applying for citizenship or residency |Apply for: Receiving an affidavit of criminal record/background clearance | Access to justice: retrieve information / file (open) online ; / manage of court cases |Services provided to people retiring from job | Apply for benefits due to illness and injury | Apply for child benefits | Apply for disability compensation benefits |Apply online for maternal or new born benefits |Apply or file for unemployment benefits.

Online service provision standardized score of countries as per EGDI survey 2022

Year	EGDI	OSI	Service Provision
Afghanistan	0.2710	0.2770	0.1867
Bangladesh	0.5630	0.6521	0.6267
Brazil	0.7910	0.8964	0.8133
China	0.8119	0.8876	0.8400
India	0.5883	0.7934	0.8267
Myanmar	0.4994	0.3073	0.1867
Nepal	0.5117	0.4592	0.4533
Pakistan	0.4238	0.5658	0.5600
Russia	0.8162	0.7368	0.7200
South Africa	0.7357	0.7487	0.7467
Sri Lanka	0.6285	0.5644	0.6133

Source: Department of Economic and Social Affairs, United Nations E-Government Survey 2022

The neighbouring countries- Afghanistan, Myanmar, Nepal, and Pakistan show a low standardised online service provision score as per United Nations E-Government Survey 2022 suggesting room for improvement. Sri Lanka and Bangladesh too didn't score high in online service provisioning advocating potential for betterment.

NeSDA

Department of Administrative Reforms & Public Grievances (DARPG) had formulated the National e-Governance Service Delivery Assessment (NeSDA) in 2019 as part of its mandate to boost the e-governance endeavours and drive digital government excellence. The biennial study assesses States, Union Territories (UTs), and focus Central Ministries on the effectiveness of e-governance service delivery. NeSDA helps the respective governments improve their delivery of citizen centric services and shares best practices across the country for all States, UTs and Central Ministries to emulate.

The portals assessed were classified into one of two categories. State / UT / Central Ministry Portal, the designated portal of the respective government that provides a single window access to information and service links, is the first category. These portals were assessed on four parameters, viz., Accessibility, Content Availability, Ease of Use, and Information Security & Privacy. The second category comprises of the State / UT / Central Ministry Services Portals which focus on the digital delivery of services and provide service-related information. The Services Portals were assessed on additional three parameters, viz., End-service Delivery, Integrated Service Delivery, and Status & Request Tracking.

In 2021, the NeSDA framework covered G2C and G2B services across seven sectors, viz., Finance, Labour & Employment, Education, Local Governance & Utility Services, Social Welfare (including Health, Agriculture & Home

Security), Environment (including Fire) and Tourism sectors. A total of 56 mandatory services were assessed for every State & UT and 27 services were assessed for Central Ministries.

NeSDA 2021 assessed 1400 services across all States and UTs as compared to 872 in 2019 and reported an increase of over 60% e-services. 69% of all possible mandatory e-Services were delivered by States and UTs, up from 48% in NeSDA 2019. 74% respondents of the nation-wide citizen survey conducted during the study had stated that they are satisfied with the e-services provided by the States and UTs. The e-services of Finance and Local Governance & Utility Services sectors were the most widely used by citizens. The rising trend of e-services delivery shifting from single silo departmental portals to integrated / unified portals has resulted in higher citizen satisfaction.

While NeSDA 2021 report provided encouraging findings for the journey of e-services excellence across India, there continues to be room for improvement in digital service delivery. Going forward, the report also delivers recommendations to improve assessment parameters, incorporate learnings from global digital government trends practices and evolve NeSDA framework.

The improvement of the country's e-Governance landscape was summarized into following key takeaways:

- **Increase in number of e-Services delivered across all States and UTs**

Significant strides have been taken to deliver increased number of e-services to build an inclusive digital ecosystem. Delivery of mandatory services across the seven sectors focusses on sustained development and improving the quality of life of the citizens.

- **Rise in use of Integrated / Unified Portals for delivery of e-Services**

As a step towards Digital India Mission, integrated services delivery platforms have provided multiple benefits including faster rollout of services, consistent interfaces, reduced friction and increased trust, leading to an overall better experience for citizens. It has also improved accessibility for higher uptake.

- **Improvement in scores of all seven assessment parameters of NeSDA framework**

Improved scores across all parameters reflects the work done towards adoption of standards for uniformity in governance.

Status of e-services in states and UTs

DARPG monitors the implementation of recommendations given in the NeSDA 2021 report through monthly review meetings and e-governance conferences in which all States/UTs/Central Governments participate. Monthly report institutionalizes the nation's endeavors for improved delivery of e-services. Total services present the total number of services which are being offered by departments across states and E-services presents the total number of services which are being offered online. The states are moving towards providing a greater number of e-services.

States/UTs	Total e-services	Total services
Madhya Pradesh	936	1,174
Karnataka	866	1,178
Haryana	768	768
Kerala	730	1,218
Uttar Pradesh	685	685
Andhra Pradesh	583	583
Assam	579	616
Odisha	566	566
Uttarakhand	566	651
Delhi	463	469
Maharashtra	454	511
Jammu & Kashmir	445	482
Meghalaya	421	433
Telangana	362	414
Himachal Pradesh	356	600
Tamil Nadu	343	434
Punjab	328	433
Jharkhand	312	363
West Bengal	276	276
Arunachal Pradesh	267	267
A&N Islands	247	247
Goa	240	240
Tripura	235	268
Puducherry	233	289
Chandigarh	231	257
Rajasthan	222	222
Gujarat	181	312
Chhattisgarh	172	347
Bihar	153	667
Mizoram	104	273
DNHDD	78	146
Nagaland	51	51
Lakshadweep	32	32
Ladakh	31	31
Sikkim	23	76
Manipur	22	22
Total	**15,601**	**12,561**

Source: NeSDA report - March, CRISIL MI&A Research

As per NeSDA report for States/UTs (March 2023)[2]:

- Departments across States/UTs provide 15,601 services
- 12,561 out of 15,601 services are provided online, i.e., 12,561 e-services are provided across States/UTs
- 80.5% of the services are digitized across States/UTs
- 1,400 out of 2,016 mandatory e-services are available, making saturation at 69.4%

[2] Note: The count of services is cumulative and tentative in nature and are provided by States/UTs as of 25/03/2023. Count of mandatory e-services is taken as per NeSDA 2021.

8 Assessment of PAN card issuance in India

8.1 Introduction to PAN card and its usage

Permanent Account Number (PAN) is a ten-digit alphanumeric number issued by the Income Tax Department (ITD) under the provisions of section 139A of the Income Tax Act, 1961. It is issued by the Indian Income Tax Department under the supervision of the Central Board for Direct Taxes (CBDT) and serves as an important proof of identification. It is also issued to foreign nationals (such as investors) and is not acceptable as proof of Indian citizenship. PAN enables the ITD to identify/ link all transactions of the PAN holder with the individual. The PAN verification process helps 'investment advisors' approved by SEBI, the RBI, banks, housing finance companies, insurance companies, mutual funds, depository participants, educational institutions established by regulatory bodies, Central and state government agencies, stock exchanges, commodity exchanges and clearing corporations to verify the authenticity of PAN provided by individuals or entities for financial transactions. These transactions include tax payments, TDS/TCS credits, returns of income, specified transactions, correspondence and so on. The online PAN verification facility has assisted in the development of strong due diligence and compliance mechanism needed for fulfilling regulatory as well as business requirements across the BFSI sector.

The issuance of PAN, its verification, delivery, and maintenance work on public-private partnership (PPP) model as it is economic, efficient, and effective. Currently, Protean eGov Technologies Ltd. and UTI Infrastructure Technology and Services Ltd (UTIITSL) are the two companies providing PAN services in India on behalf of the Government of India. Services offered by the two players include processing of applications, collecting, handling, and verifying of personal documents such as proof of identity, age and address, seeking clarification from applicants, printing the card and the letter and then mailing it. Anyone wishing to obtain PAN can apply offline by submitting the application form along with the related documents and prescribed fees at the PAN application centre.

There are two types of PAN applications:

- **Application for allotment of PAN:** This application form should be used when the applicant has never applied for a PAN or does not have PAN allotted to him.
- **Application for new PAN card or/and changes or corrections in PAN data:** Those who have already obtained their PAN and wish to obtain the new PAN card or want to make some changes / corrections in their PAN data, are required to submit their applications to get it updated.

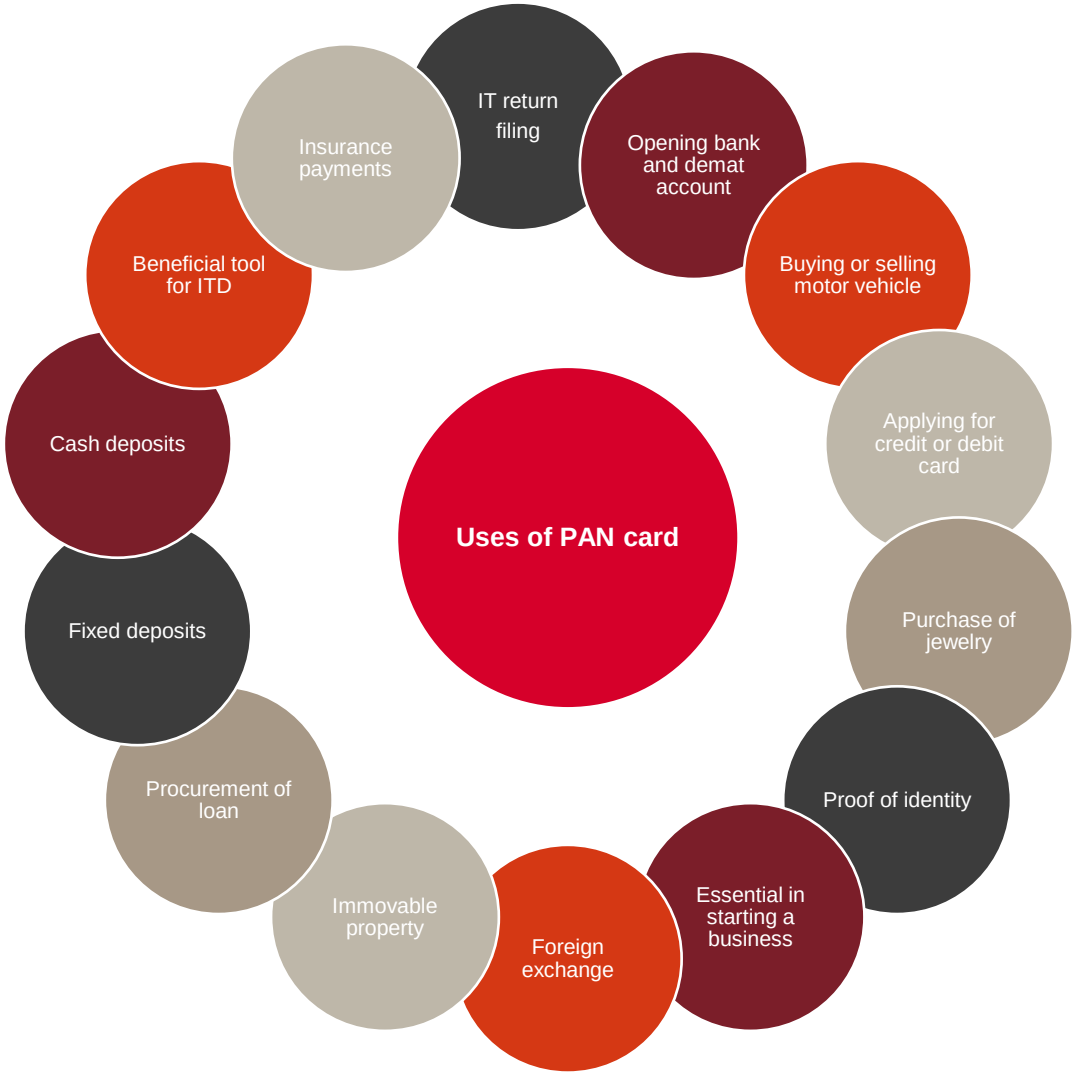
Applicant may either make an online application through website (Protean eGov Technologies Ltd and UTIITSL) or submit physical PAN Application to any TIN-FC or PAN centre.

The application details are forwarded to ITD after digitization of the submitted form. In case of application for allotment of PAN, a new PAN is allotted by the ITD. Protean/UTIITSL prints the PAN card after allotment of PAN by the ITD and dispatches it along with an allotment letter to the respective applicant.

In case of a request for new PAN card or/and changes or correction to be made in the PAN data, the application is forwarded to the ITD for updating the database. After confirmation from ITD, a new PAN card is printed and dispatched to the applicant.

Normally, the application is processed, and the PAN card is dispatched in two weeks, provided the application is in order in all respects.

Illustrated below are all the key uses of PAN card



Source: CRISIL MI&A Research

Essential in starting a business

As per norms laid down by the Government of India, the PAN is mandatory for every business in the country.

IT returns filing

All individuals and entities subject to income tax must file an IT return. A PAN card is required to file an IT declaration and is the main reason both individuals and other businesses apply for a PAN card.

Opening a bank account or demat account

A PAN card is required to open a new bank account, whether it is a savings or a current account. All banks, be it public, private, or co-operative bank, require the submission of a PAN card to open an account with them. Similarly, a PAN card is necessary when an individual opens a demat account.

Buying or selling a motor vehicle

To buy or sell a motor vehicle worth more than Rs. 0.5 million, individuals are required to provide PAN Card details when conducting the transaction.

Applying for a credit or debit card

When applying for a debit or credit card from a bank or financial institution, it is legally required to provide PAN card details. Banks do not issue cards if this criterion is not met.

Purchase of jewellery

To buy jewellery that is valued at over Rs. 0.5 million, individuals are required to provide PAN card details at the time of purchase

Proof of Identity

The PAN card is nationally recognized as a valid form of identification and is also valid proof of age. It can also be used as an identification document when applying for a passport, voter card, driver's license, electrical connection, etc.

Foreign Exchange

For conversion of Indian currency into foreign currency while travelling abroad, individuals are required to provide details of PAN card at the money exchange bureau/bank/institution where they are converting the money.

Immovable property

Buying, selling, or renting real estate property in India requires PAN card details. In the case of buying of property, the PAN details of the buyer as well as the seller must be listed on the sales deed and any other such documentation for the sale to be complete.

Procurement of loan

Individuals willing to take out a loan either from banks or other lending institutions are required to submit details of PAN at the time of loan application. All loans, from education loans to personal loans require PAN details for the loan to be approved.

Fixed deposits

Individuals planning to invest money in a Fixed Deposit (FD) amounting to above Rs. 50,000 in a bank, they are required to provide PAN details. This is done as the bank will deduct TDS (Tax Deductible at Source) on the FD interest amount.

Cash deposits

Individuals making a cash deposit that amounts to over Rs. 50,000 at a time, are required to submit PAN details as well. This is in keeping with the RBI mandate, which directs banks to report any large cash deposits to the RBI to prevent money laundering.

Insurance Payments

As per the ITD directives, PAN card details must be furnished when making an insurance payment exceeding Rs. 50,000 a year.

Beneficial tool for the income tax authorities

Apart from the benefits for Indian citizens, the PAN card has several uses with the country's income tax authorities. These benefits are:

- Through the PAN card, the Income Tax Department of India can track all financial transactions. These transactions are important in determining an organization's or an individual's tax liability. Additionally, this reduces the potential for tax evasion, which is one of the most important uses of PAN cards.
- PAN maps are used to determine the total tax revenue generated in the country.
- PAN card also helps to determine a company's tax rate based on income.

8.2 Issuance of PAN cards in India

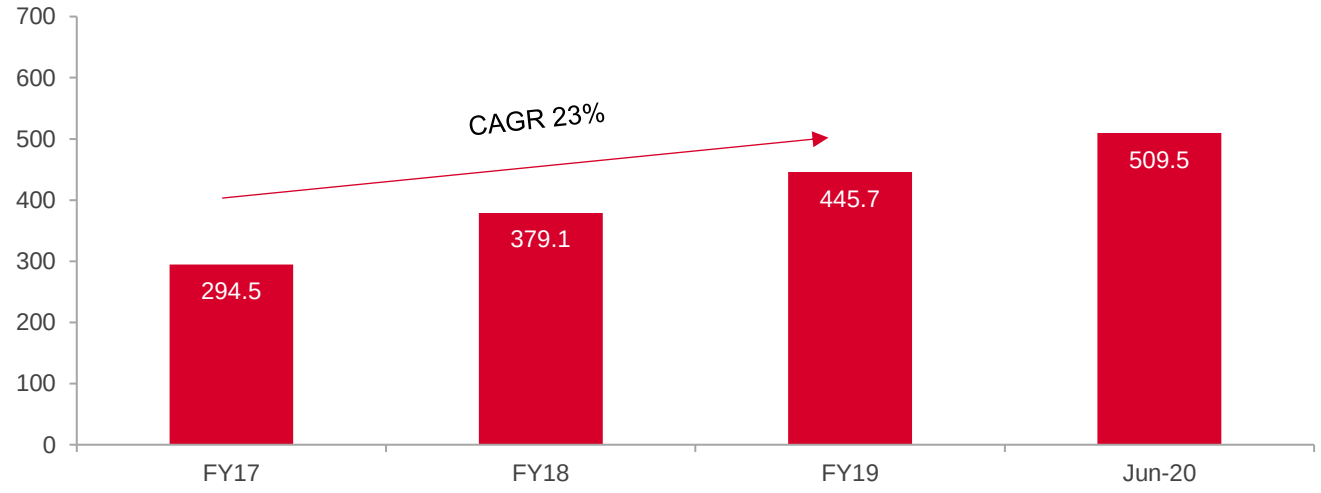
PAN card allotment grew by 23% CAGR from FY2017-19

PAN card is mandatory to file tax returns in India. A PAN card is issued to all those people/entities who form the taxpayer base. A taxpayer is an individual or corporation who pay taxes annually on earnings as per the provisions of the Income Tax Act. The Act applies different tax rates depending on the category of taxpayers. It categorises taxpayers as individuals, Hindu undivided family (HUF), association of persons (AOP), body of individuals (BOI), firms, companies, government, local authorities, AOP (trust), and artificial juridical person (AJP). Till date, over 97% of the total allotments have been made to individuals.

Increase in the number of PAN allotments reflects the efforts made by the government to widen the taxpayer base. Increasing emphasis on financial inclusion in the country, widening the usage of PAN cards, expanding the formal economy and overall GDP growth in the nation have led to expansion of the taxpayer base, which, in turn, has increased the number of PAN card allotments in the last decade.

As of 29 June 2020, the number of PAN allotted stood at 509.5 million.

Total allotment of PAN cards in India (in million)

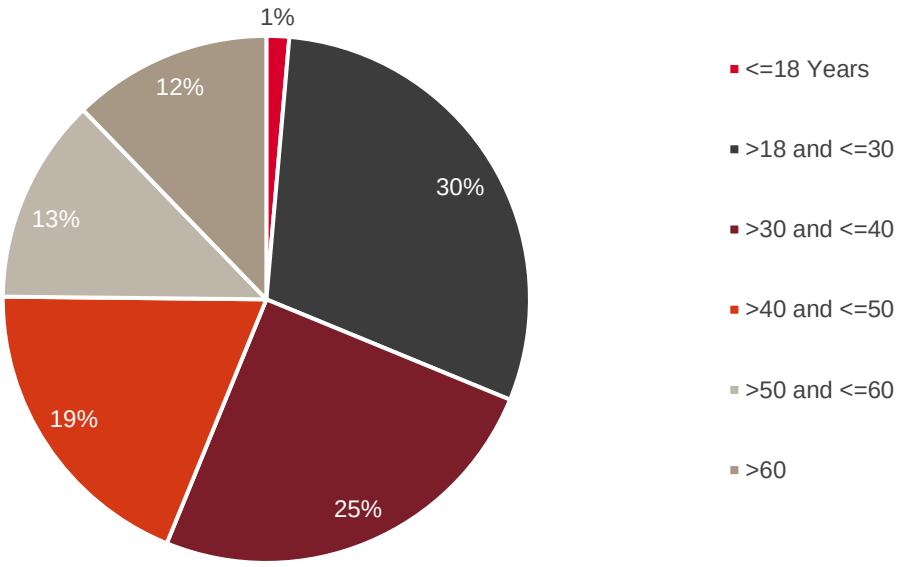


Source: Income tax department, CRISIL MI&A Research

More than half of the individual PAN card allotments fall in the 19-40 years age bracket

Demographically, India is a young country with the median age of its population at ~28 years. Of India's population, more than 60% is in the working age group, which is 19-59 years of age. Therefore, out of the total allotments, 55% have been made to people belonging to the 19-40 years age group. In fact, the 19–50-year age bracket accounts for almost three-quarters of the total PAN cards allotted.

Age-wise allotment of PAN card as of March 2019



Source: Income Tax Department, CRISIL MI&A Research

8.3 PAN card application charges

Application charges differ based on the type of PAN card required

If physical PAN card is required:

While submitting PAN application form, the applicant needs to indicate whether physical PAN card is required. If the applicant opts for physical PAN card, then the physical PAN card is printed and dispatched to the communication address. The e-PAN card is dispatched in PDF format to the e-mail ID, if mentioned, in the PAN application form.

Charges applicable for dispatch of physical PAN card

Particulars	Fees (excluding GST, in Rs)	Fees (including GST, in Rs)
PAN applications submitted at TIN facilitation centres / PAN centres	93	110
PAN applications submitted online using physical mode (i.e., physical documents forwarded)	93	110
PAN applications submitted online through paperless modes (e-KYC & e-sign / e-sign scan based)	86	101
Request for Reprint of PAN card submitted through separate online link	42	50

Source: CRISIL MI&A Research

If physical PAN card is not required:

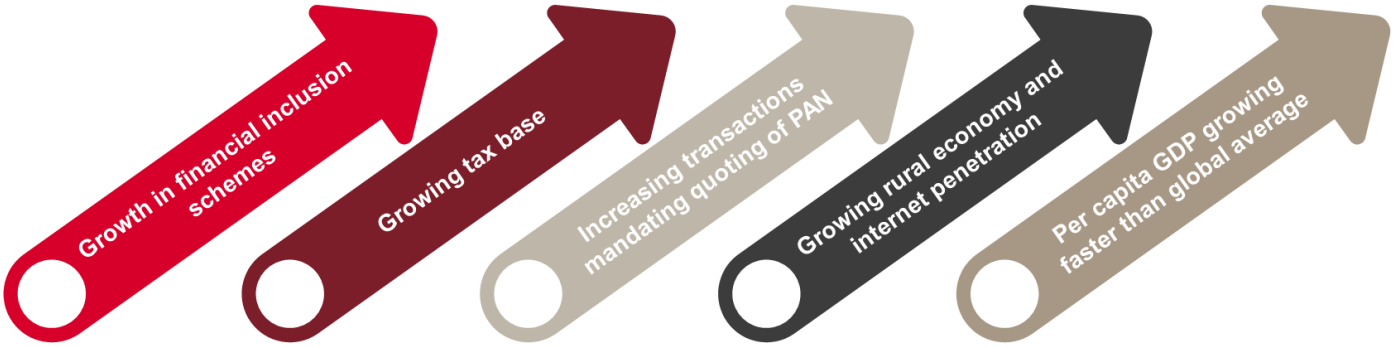
At the time of submission of the PAN application, the applicant needs to indicate if the physical PAN card is not required. In such cases, providing the email ID is mandatory and the e-PAN card is sent to the applicant's email ID. The physical PAN card will not be dispatched in such cases.

Charges applicable for dispatch of e-PAN card

Particulars	Fees (excluding GST, in Rs)	Fees (including GST, in Rs)
PAN applications submitted at TIN facilitation centres / PAN centres	61	72
PAN applications submitted online using physical mode (i.e., physical documents forwarded)	61	72
PAN applications submitted online through paperless modes (e-KYC and e-sign / e-sign scan based)	56	66

Source: CRISIL MI&A Research

8.4 Growth drivers for PAN card issuance



Source: CRISIL MI&A Research

Further growth in financial inclusion schemes would augment PAN card issuance

Financial inclusion refers to a method in which every individual in the society is provided with banking and financial solutions and services irrespective of their earnings. With an aim to provide banking services for the unbanked population in the country, the Government of India started the National Mission for Financial Inclusion (NMFI), namely Pradhan Mantri Jan Dhan Yojana (PMJDY), in 2014. In order to implement this scheme, a digital pipeline has been set up linking the Jan-Dhan account with the Aadhaar card of the account holder. Under PMJDY, a basic savings bank deposit account can be opened at any branch or business correspondent outlet by persons not having any other account.

In addition to this, the Reserve Bank of India (RBI) along with National Bank for Agriculture and Rural Development (NABARD) has undertaken several steps such as issue of Kisan Credit Cards, improving the banking network in remote areas, increasing the number of ATMs, linkage of self-help groups with banks, etc.

Apart from those mentioned above, the Government of India has also introduced other schemes to promote financial inclusion, as illustrated below:

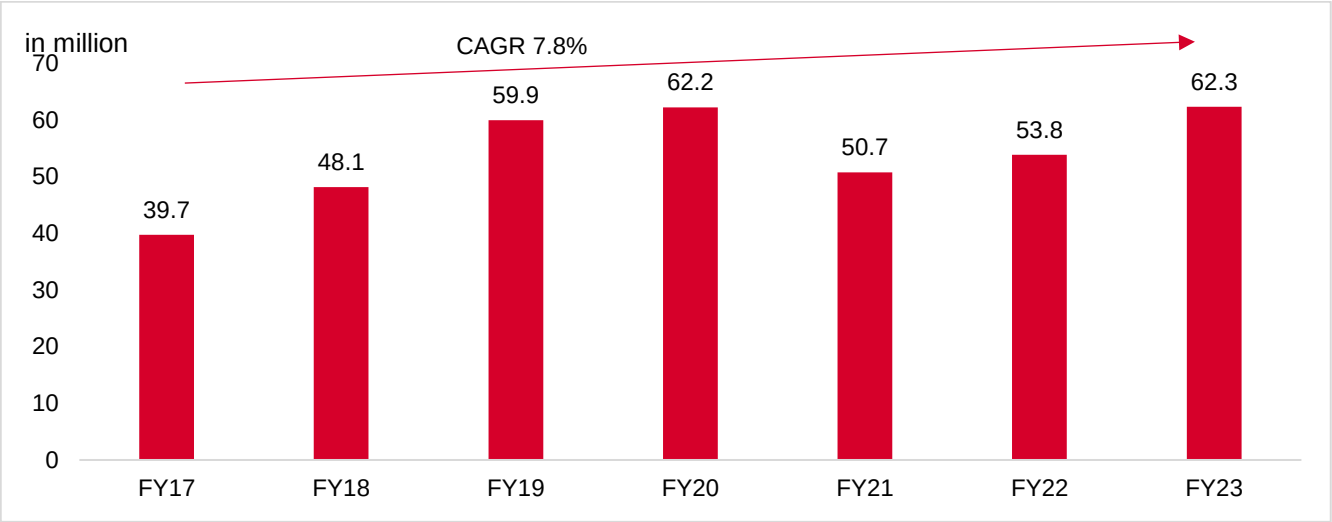
Stand-Up India scheme

In order to promote economic growth through entrepreneurship and job creation, Government of India on 5th April 2016 introduced stand-up India scheme. This scheme enables underserved population of economy such as scheduled castes (SCs), scheduled tribes (STs) and women entrepreneurs to avail a loan through scheduled commercial banks between Rs 1 million to Rs 10 million in setting up a greenfield enterprise across manufacturing, service and trading sectors, thereby enabling them to contribute to economic growth. As per PIB, over 1,80,636 accounts have availed this scheme and Rs 407 billion has been sanctioned as of 21st March 2023 since inception.

Pradhan Mantri Mudra Yojana (PMMY)

PMMY is launched by the Government of India through Micro Units Development & Refinance Agency Ltd. (MUDRA) on April 8, 2015. This scheme provides loans to non-corporate, non-farm small/micro enterprises up to an amount of Rs.1 Million and are classified as mudra loans. These loans can be availed through Commercial Banks, RRBs, Small Finance Banks, MFIs and NBFCs. As of fiscal 2023, number of loans sanctioned under this scheme stand at ~62 million growing at CAGR of ~8% from FY17.

Number of PMMY loans sanctioned (In Million)



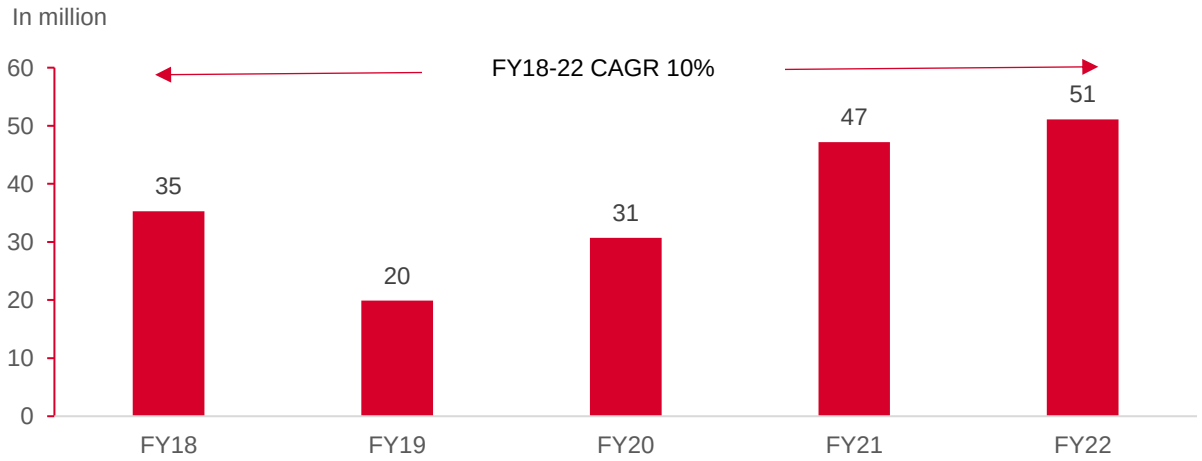
Source: MUDRA, CRISIL MI&A Research

Pradhan Mantri Suraksha Bima Yojana (PMSBY)

PMJJBY has been launched by Government of India as of 9th May 2015. The main objective of this scheme is to provide an insurance for underprivileged population of the society in the age group of 18-70 having a bank account at a premium of Rs 12 per annum. During March 2022, the premium for PMSBY has been revised from Rs. 12 to Rs. 20 per annum respectively which will be in effect from June 2022.

Number of enrolments under this scheme have grown at a CAGR of ~10% from 35 million in FY18 to 51 million in FY22.

Persons enrolled each year under PMSBY (In Million)



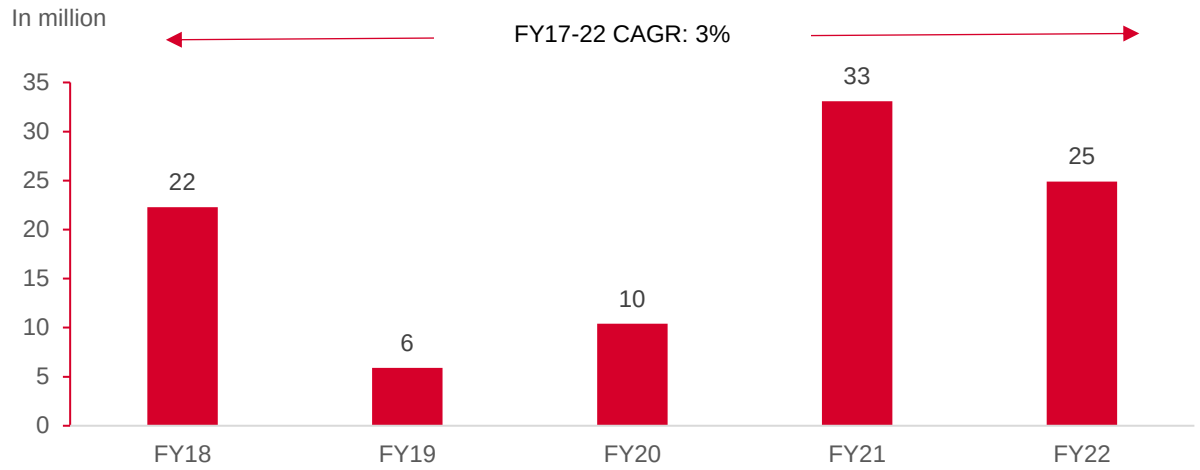
Source: www.jansuraksha.gov.in, *CRISIL MI&A Research*

Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)

PMJJBY has been launched by Government of India as of 9th May 2015. The main objective of this scheme is to provide a renewable life insurance for underprivileged population of the society in the age group of 18-50 with an insurance cover of Rs 0.2 million at a premium of Rs 330 per annum. During March 2022, the premium for PMJJBY has been revised from Rs. 330 to Rs. 436 per annum respectively which will be in effect from June 2022.

Enrolments under this scheme have from FY18 at a CAGR of 3% reaching 25 million enrolments by the end of FY22.

Persons enrolled each year under PMJJBY (In Million)



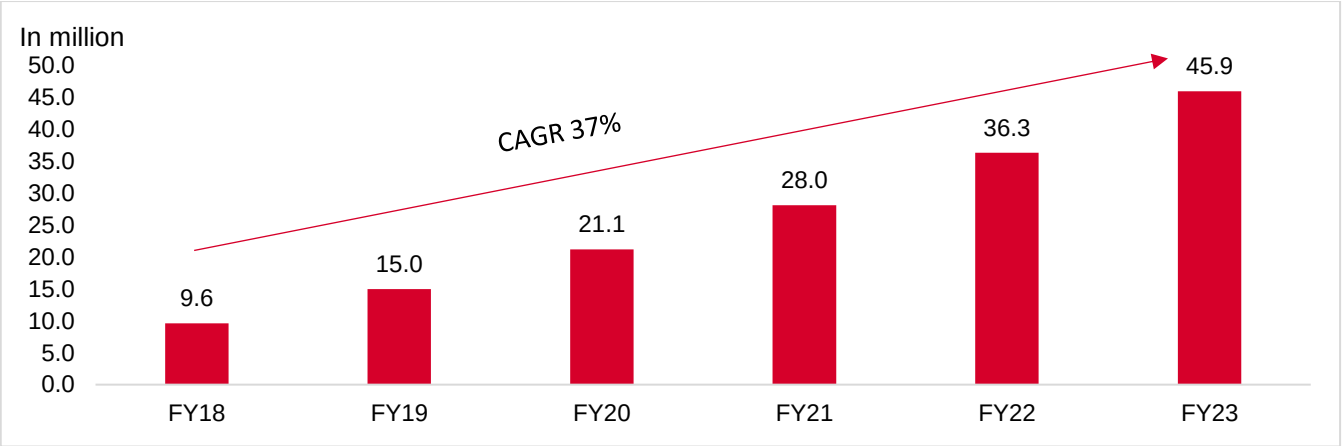
Source: www.jansuraksha.gov.in, CRISIL MI&A Research

Atal Pension Yojana (APY)

Announced in the union budget 2015-16, APY was launched as of May 2015 and is administered by Pension Fund Regulatory and Development Authority (PFRDA). The main aim of the scheme is to provide benefits of pension especially to the workers in unorganized sectors. This scheme acts an extension to existing National Pension Scheme (NPS) and a replacement to earlier existing Swavalamban Pension Yojana. All the members can avail the scheme through NPS architecture.

Number of subscribers for APY has seen a healthy growth of 37% CAGR from FY18 to FY23.

Number of subscribers for APY scheme (In Million)



Source: PFRDA, CRISIL MI&A Research

With PAN being accepted as of the proofs that need to be submitted to avail the above-mentioned schemes, further penetration of these schemes would also support growth in PAN card applications and services.

Wider taxpayer base would propel growth in PAN card applications and services

PAN has been made mandatory for every individual to transact with the ITD of India. The taxpayer base in India, has seen a continuous rise over the years. It has grown at a CAGR of 9.9% from FY13 to reach 84.5 million in FY18. Of the total taxpayers, individuals account for a significant share of 95%. This growth can be attributed to initiatives

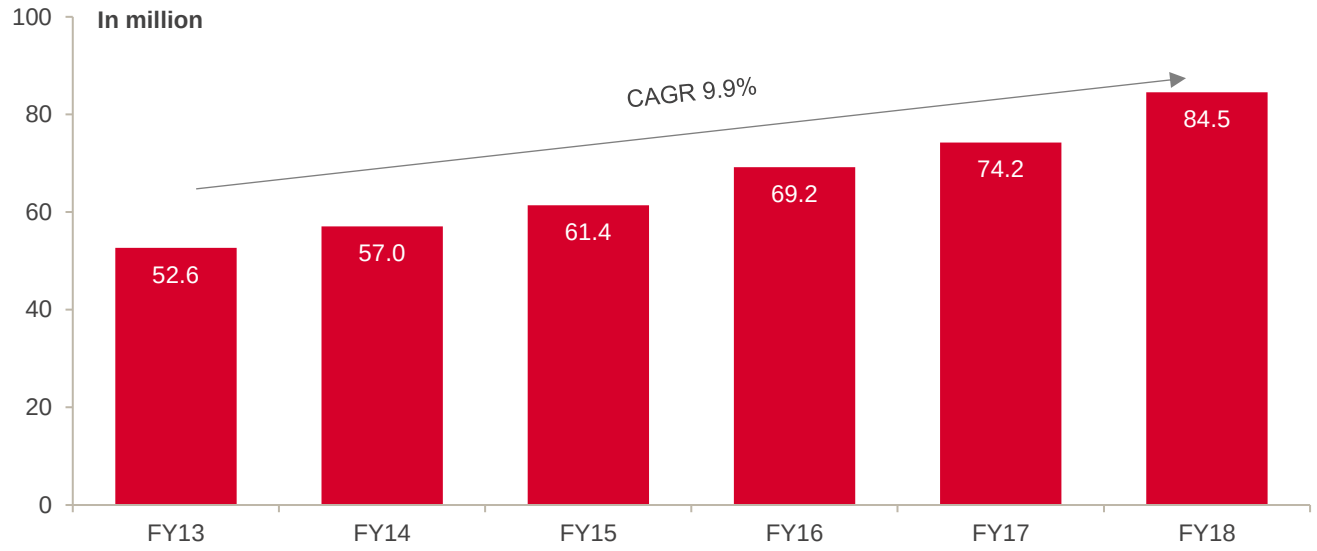
taken by Government of India such as demonetisation implemented in November,2016 which has brought in new taxpayers into the system leading to increase in number of tax payments.

In addition to this, implementation of Goods and Service Tax (GST) which has led to increase in compliance and also abolished cascading taxation that has bolstered the growth in number of tax payers.

Other than above mentioned factors, going forward, schemes introduced by the Government of India, such as PMJDY, PMMY, etc, would further increase the tax-paying population. This would lead to greater need for issuance of PAN cards to the untapped population in the country.

This also creates an opportunity for other services such as PAN updates arising from the need to change name, address, and re-issuance in case of a lost card. With the government's efforts to widen the tax base and increase transparency by promoting paperless transactions, volumes for PAN cards are expected to grow.

Number of taxpayers in India



Source: Income Tax Department, CRISIL MI&A Research

Transactions mandating quoting of PAN expected to boost PAN card applications

PAN card enables the ITD to link the transactions undertaken to a particular person or an entity. In turn, it also facilitates retrieval of financial transactions done. In order to expand the tax base in the country, the Government of India has mandated quoting the PAN for a particular set of transactions.

List of transactions where PAN needs to be quoted

S. no.	Nature of transactions	Value of transactions
1	Sale or purchase of a motor vehicle or vehicle other than two-wheeled vehicles	All transactions
2	Opening an account [other than a time deposit and basic savings bank account] with a banking company or a co-operative bank	All transactions
3	Making an application for issue of a credit or debit card	All transactions

4	Opening of a demat account with a depository, participant, custodian of securities or any other person with SEBI	All transactions
5	Payment in cash to a hotel or restaurant against bill at any one time	Amount exceeding Rs 50,000
6	Payment in cash to any foreign country or payment for purchase of any foreign currency	Amount exceeding Rs 50,000
7	Payment to a mutual fund for purchase of its units	Amount exceeding Rs 50,000
8	Payment to a company or an institution for acquiring debentures or bonds issued by it	Amount exceeding Rs 50,000
9	Payment to the Reserve Bank of India for acquiring bonds issued by it	Amount exceeding Rs 50,000
10	Deposits of cash during any one day with a banking company or a co-operative bank	Amount exceeding Rs 50,000
11	Purchase in cash of DD (demand drafts or banker's cheques) from a banking company or co-operative bank	Amount exceeding Rs 50,000
12	Time deposit with a bank, post office, nidhi companies, NBFCs	Amount exceeding Rs 50,000 per day and 0.5 million per year
13	Payment for prepaid instruments, issued by RBI to a banking company or co-operative bank in a year	Amount exceeding Rs 50,000
14	Payment for life insurance premium in a year	Amount exceeding Rs 50,000
15	A contract for sale or purchase of securities (other than shares)	Amount exceeding Rs 0.1 million per transaction
16	Sale or purchase of unlisted shares	Amount exceeding Rs 0.1 million per transaction
17	Sale or purchase of any immovable property	Amount exceeding Rs 1 million

Source: Income Tax Department, CRISIL MI&A Research

Further to the above-mentioned transactions, the Central Board of Direct Taxes (CBDT) has mandated that all transactions exceeding Rs 0.2 million (irrespective of mode of payment) need to quote PAN. Lowering of limits of financial transaction which mandate quoting of PAN would boost PAN card application and online verification of PAN. With increasing financial transactions expected to increase in future, coupled with a wider taxpayer base, PAN card penetration in India is likely to increase further.

Growing rural economy and internet penetration to aid growth in PAN applications

Financial inclusion of individuals is less in rural India, when compared with its urban counterparts. As of Census 2011, only 54.46% of the rural households availed banking services, whereas 67.68% of urban households availed banking services. In order to reduce the gap and build financial awareness among the rural population, the

Government of India has undertaken initiatives such as PMJDY for opening a no-frills bank account. As of March 29, 2023, the number of accounts opened under this scheme reached 487 million with deposits of over Rs 1,988 billion.

In addition to this, the government, through its Digital India programme, has introduced common service centres (CSC) for availing e-governance services in villages. These services are driven by growth in internet penetration in rural areas which has increased from 10.7% (of total rural subscribers) in December 2014 to 38.3% (of total rural subscribers) in September 2022. Going forward, CRISIL MI&A Research expects internet penetration in total rural population to reach 55-60% by end of December 2026. This increase is bolstered by growth in rural internet subscriber base at a CAGR of 9-11% between 2022 and 2026.

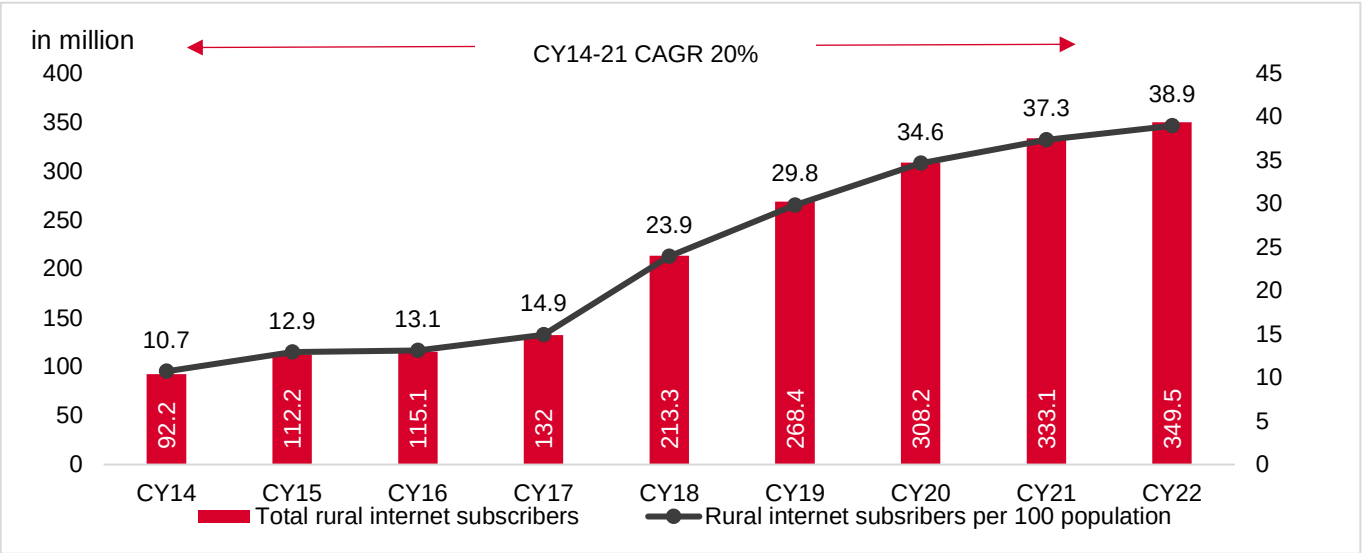
Growth in internet penetration coupled with many of above-mentioned services requiring PAN card as one of the proofs of identity, would drive demand for PAN card applications in rural India.

Status of PMJDY as of May 24, 2023

Bank name/ Type	Number of beneficiaries at rural/semi-urban centre bank branches (million)	Number of beneficiaries at urban metro centre bank branches (million)	Number of total beneficiaries (million)	Deposits in accounts (Rs billion)	Number of Rupay debit cards issued to beneficiaries (million)
Public sector banks	242.2	143.3	385.5	1,529.1	287.2
Regional rural banks	78.4	12.8	91.2	383.4	34.5
Private sector banks	7.1	7.0	14.1	57.3	11.5
Total	327.7	163.1	490.8	1,969.9	333.3

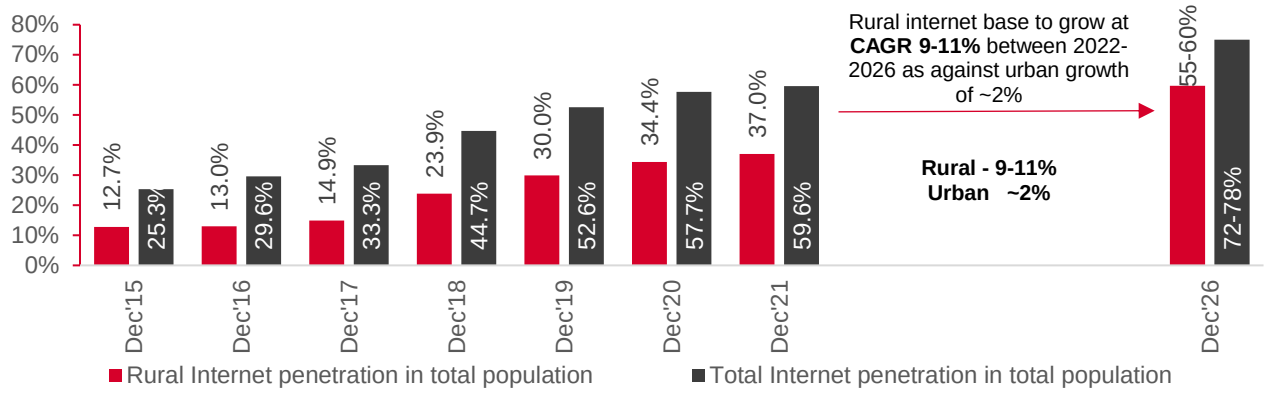
Source: PMJDY, CRISIL MI&A Research

Internet penetration in rural India



Source: Telecom Authority of India, CRISIL MI&A Research

Internet penetration Outlook in India



Source: Telecom Authority of India, CRISIL MI&A Research

India's per capita GDP growing faster than global average

India's per capita income, a broad indicator of living standards, clocked a CAGR of ~4% from fiscals 2012 to 2023, rising from Rs 63,462 to Rs 98,374. The growth in per capita income was led by better job opportunities, propped up by overall GDP growth. Moreover, population growth has remained stable at ~1% CAGR.

Per capita net national income at constant prices (in Rs)

At constant prices	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Per capita net national income	63,462	65,538	68,572	72,805	77,659	83,003	87,586	92,133	94,420	86,054	92,583	98,374
On-year growth (%)		3.3%	4.6%	6.2%	6.7%	6.9%	5.5%	5.2%	2.3%	-9.7%	7.5%	6.3%

Source: Ministry of Statistics and Programme Implementation (MoSPI), CRISIL MI&A Research

Global per capita GDP clocked a CAGR of 1.5% between CY2012 and CY2021, as per IMF data. Meanwhile, India's corresponding figure clocked a CAGR of 4.3%, faster than the global number.

Per capita GDP (constant prices)

	CY12	CY13	CY14	CY15	CY16	CY17	CY18	CY19	CY20	CY21	CAGR CY12-21
India's per capita GDP ($)	1,347	1,416	1,503	1,606	1,719	1,817	1,914	1,966	1,818	1,961	4.3%
Global per capita GDP ($)	9,709	9.863	10,043	10,232	10,396	10,625	10,853	11,019	10,549	11,057	1.5%

Source: World Bank, CRISIL MI&A Research

9 National pension system central record keeping

9.1 Overview of national pension system

Pension plans serve as a means of financial stability and security after retirement

Pension plans are investment plans in which individuals can invest a part of their income and accumulate savings over a specific period of time. The purpose of the plan is to provide people with financial security after retirement. With the increase in private sector jobs, and a steady rise in inflation and average lifespan, demand of pension plans has risen over the past few years.

Pension plans have two stages – the accumulation stage and the vesting stage. In the accumulation stage, investors pay regular premiums until they reach the age of retirement. On reaching the retirement age, the second stage – vesting stage – begins and retirees start receiving annuities. They get the returns until their death or the death of their nominee, depending on the plan.

Based on the scheme structure and benefits, pension plans can be divided into eight major categories:

- **Deferred annuity:** This is the most basic retirement plan, which helps investors build a substantial retirement corpus through regular premium or single premium payment over a policy term. Investors also get tax benefits from the scheme offers. Retirees start receiving regular annuities at the end of the accumulation phase.
- **Immediate annuity:** In an immediate annuity plan, the pension starts immediately after the subscriber pays the premium. There is no accumulation stage. It is useful for retirees who receive a lump sum amount on retirement. They can invest the amount in this plan to receive regular pension. If the policyholder dies, the policy allows their nominee to receive the money.
- **Annuity certain:** In this scheme, annuitants are paid the annuity for a certain number of years. They can pick this period, and in case of their death, their nominees can claim the pension.
- **With cover and without cover pension plans:** Pension plans with cover means the life of the policyholder is covered and upon his death, a lump sum amount is paid to his immediate family members, also known as nominees. The without-cover plan as the name suggests does not have life cover. If the policyholder passes away, then the nominee gets the corpus so built during the lifetime.
- **Guaranteed period annuity:** Guaranteed period annuity offers guaranteed return and ensures that immediate family members of annuitants get the benefits even after the death of the policyholder as along as the annuity is guaranteed.
- **Life annuity:** In the life annuity plan, the pension amount is paid to policyholder until their death. Policyholders can opt for with-spouse scheme, under which the spouse will get the pension amount in case the policyholder dies.
- **Pension funds:** Pension funds are regulated by the Pension Fund Regulatory and Development Authority (PFRDA) of India. These plans offer comparatively better returns at the time of maturity and remain in force for a substantial amount of time.
- **National pension system:** The National Pension System (NPS) is a pension programme the central government started in January 2004. Employees from public, private and even unorganised sectors, except armed forces,

can invest in this scheme. Under this scheme, people can invest in a pension account at particular intervals while they are employed. Post-retirement, they can withdraw a certain percentage of the accumulated amount, while the balance amount can be availed as a monthly pension.

9.2 Overview of NPS and intermediaries involved

NPS is an important milestone in the development of voluntary defined contribution pension system

The NPS started with the government's decision to shift its employees who joined after April 1, 2004, from defined benefit pension to defined contribution pension. NPS is a voluntary and long-term contributory pension program the central government introduced under the PFRDA to ensure income security in the old age. It is aimed at inculcating among citizens a habit of saving for retirement and is an attempt to provide sustainable and adequate retirement income to each and every citizen. The scheme is portable across jobs and locations and enjoys tax benefits under Section 80C and Section 80CCD of the Income Tax Act.

Under the NPS, individual savings are pooled into a pension fund. Professional fund managers regulated by the PFRDA invest this corpus in diversified portfolios comprising government bonds, bills, corporate debentures, and shares, as per the approved investment guidelines. These contributions would grow and accumulate over the years, depending on the returns earned on the investments made. At the time of normal exit from the NPS, subscribers may either use the accumulated wealth to purchase a life annuity from a PFRDA-empanelled life insurance company or also withdraw a part of the amount as lump-sum, if they choose so.

NPS has unbundled Architecture, where each function is performed by different entity

The PFRDA is an authority set up by the Centre through an Act of Parliament in 2013 to ensure old-age income security by establishing, regulating, and developing pension funds to protect the interest of subscribers to schemes of pension funds and for matters connected therewith or incidental thereto. It is the regulator for the NPS.

The NPS architecture consists of an NPS Trust, which is entrusted with safeguarding subscribers' interests; central record keeping agencies (CRAs), which maintain the data and records; point of presence (POP) and aggregators as collection and distribution arms; competing pension fund managers for generating and maximising returns on investments of subscribers; and custodian to take care of the assets purchased by fund managers and trustee banks to manage the banking operations. The entities involved in NPS are as follows:

NPS Trust: The National Pension System Trust (NPS Trust) was established by the PFRDA on February 27, 2008, by executing an NPS Trust Deed. The trust has been set up for taking care of the assets and funds under the NPS in the interest of the beneficiaries (subscribers). Individual NPS subscribers shall be beneficiaries of the trust. The NPS fund is managed by the Board of Trustees to realise and fulfil the objectives of the NPS Trust in the exclusive interest of subscribers.

CRA: The PFRDA has appointed the Protean eGov Technologies Limited, KFin Technologies (Kfintech) Private Limited and Computer Age Management Services Ltd (CAMS) as CRAs for the NPS. CRAs carry out the functions of record keeping, administration and customer service for all subscribers under NPS. They issue a permanent retirement account number (PRAN) to each subscriber and maintain data base of each PRA and record transactions under each PRAN. PFRDA granted Certificate of Registration (CoR) to Computer Age Management Services Ltd. (CAMS) in March 2021 to act as Central Record keeping Agency (CRA) for NPS.

Pension fund managers: Pension fund managers (PFMs) are intermediaries who are granted a certificate of registration as a pension fund by the PFRDA. They can receive contributions, accumulate them and make payments to subscribers in the manner as may be specified by the authority.

Trustee bank: As an intermediary, the trustee bank is responsible for the day-to-day flow of funds and providing banking facilities in accordance with the guidelines/ directions issued by the authority under the NPS. It receives NPS funds from all nodal offices and transfers them to the pension funds / annuity service providers/ other intermediaries as per the operational guidelines. The appointment of Trustee Bank is valid for a period of five (5) years from the date of appointment subject to annual review or any other period or at any point of time as may be notified by the authority. The PFRDA has appointed Axis Bank Ltd. as the trustee bank for the NPS effective from 8th January 2021.

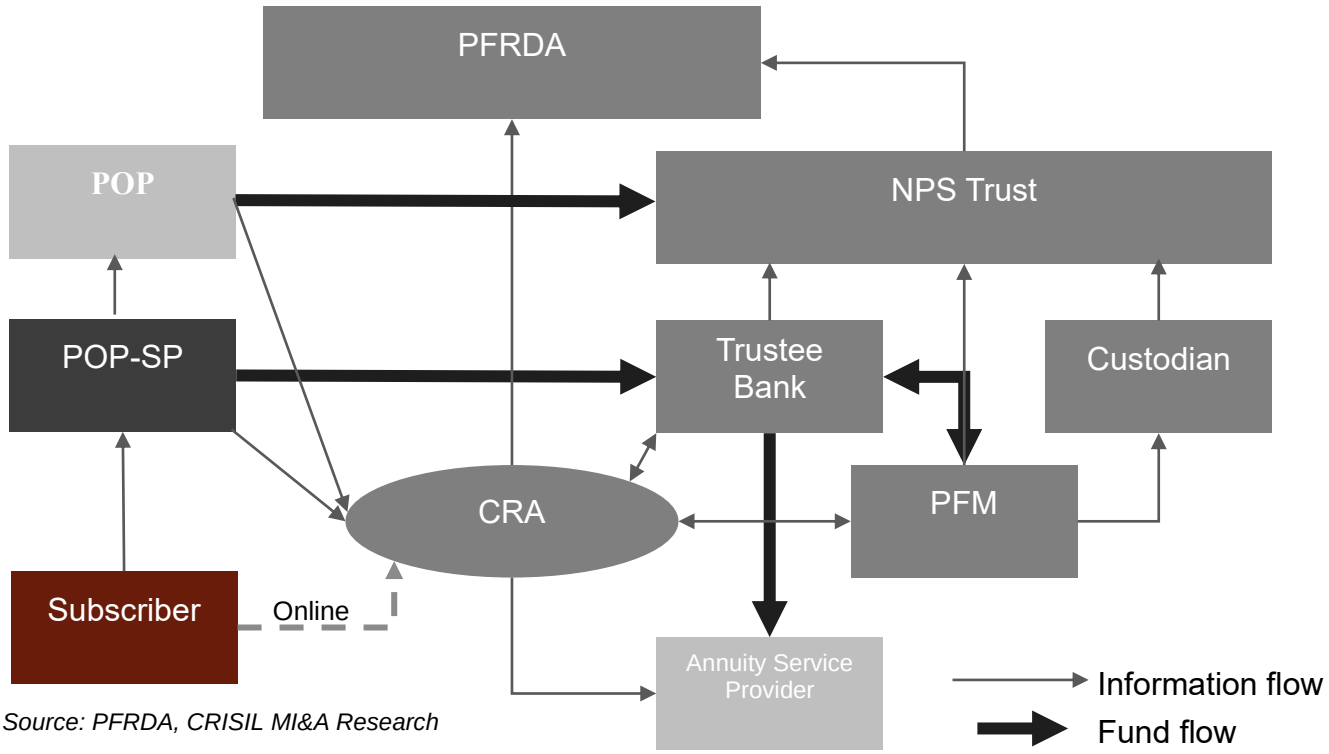
Annuity service providers: Annuity service providers (ASPs) would be responsible for delivering a regular monthly pension to subscribers after they exit from the NPS. The PFRDA appoints ASPs.

Point of presence: POPs are financial institutions who act as the first points of interaction for NPS subscribers within the NPS architecture. The authorised branches of a POP, called point of presence service providers (POP-SPs), act as collection points and extend a number of customer services to NPS subscribers. As of April 2022, there are 312 POPs registered with PFRDA and as of June 2022, there are 51 POP-Ses registered with PFRDA.

Corporate head office: A corporate wishing to offer the NPS to its employees can join the scheme by registering as a corporate head office (CHO) through a POP. The various branches of the corporate can be registered as corporate branch offices (CBOs).

The Stock Holding Corporation of India Ltd. functions as the custodian for the NPS.

NPS architecture (for all citizens)



Source: PFRDA, CRISIL MI&A Research

9.3 Charges levied by CRAs

The CRAs' charges include those levied for opening NPS account, annual maintenance of the account, processing contribution, change requests, withdrawal requests, sending statement of account and other requests such as re-print of PRAN card etc. Charges applicable for various services are given in the following table.

Charges levied by CRAs (in Rs)

Charge head	Protean-CRA	Kfin CRA	CAMS CRA
Account opening: Physical PRAN card- NPS	40.00	39.36	40.00
Account opening: ePRAN card – welcome kit in physical format- NPS	35.00	39.36	40.00
Account opening: ePRAN card – welcome kit via email only- NPS	18.00	4.00	18.00
Account opening- NPS Lite or APY	15.00	15.00	15.00
Annual PRA maintenance- NPS	69.00	57.63	65.00
Annual PRA maintenance- NPS Lite or APY	20.00	14.40	16.25
Charge per transaction- NPS	3.75	3.36	3.50
Charge per transaction- NPS Lite or APY	Free	Free	Free

Note: The charges mentioned above exclude GST

Source: NPS Trust, company website, CRISIL MI&A Research

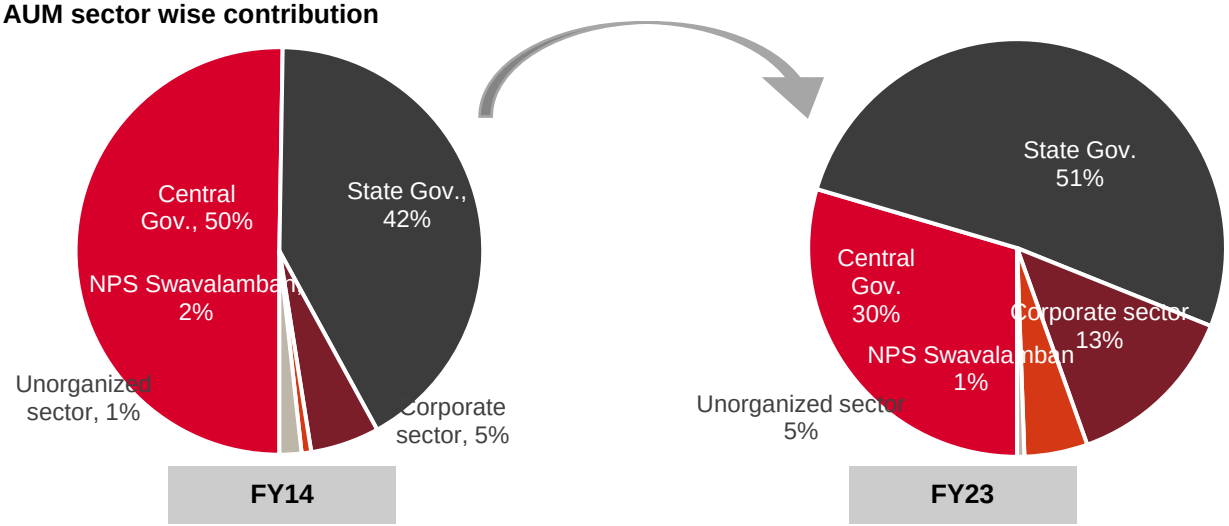
In case of government employees, CRA charges are paid by the respective governments. In case of subscribers from the private sector, Tier-I account opening charges can be borne either by Corporate or Subscriber, at the discretion of Corporate. Tier-II transaction charges are same as Tier-I, however it will be borne by subscriber only.

9.4 Trend in subscribers' addition and asset under management (AUM)

Government sector employees contribute the most in NPS AUM

In fiscal 2014, the combined contribution of central and state government was ~92% in the total AUM of NPS with share of corporate sector standing at ~5%. However, with increased awareness of NPS, the share of corporate sector has jumped to 13.5% as of fiscal 2023 in the total NPS AUM. NPS has seen traction in the unorganised sector too with share increasing from 1% to 5% during the same period.

NPS AUM sector wise contribution

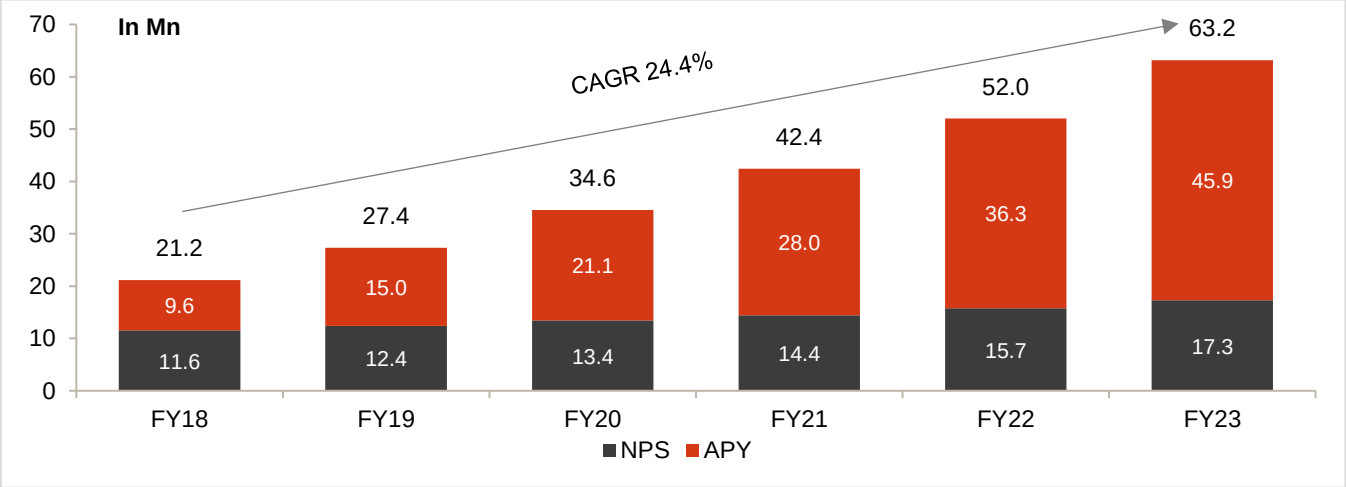


Source: NPS Trust, CRISIL MI&A Research

AUM of NPS has advanced at a CAGR of 33.4% in last five fiscals

To address the longevity risks of workers in the unorganised sector and to encourage them to voluntarily save for their retirement, the Indian government announced a new scheme called Atal Pension Yojana (APY) in the Union Budget 2015-16. All unorganized sector workers can avail the APY, which is administered by the PFRDA through the NPS architecture. Under this scheme, a minimum monthly pension between Rs.1,000 to Rs.5,000 is guaranteed for the beneficiaries. Subscribers can opt for a monthly pension which could be 1,000, 2,000, 3,000, 4,000 or 5,000 rupees, which will start after the age of 60 years. The amount of pension one receives is directly related to the age at which the individual has joined APY and the monthly amount which is contributed. The average annual contribution per person under APY has increased from Rs ~3,750 in fiscal 2018 to Rs ~5,320 in fiscal 2023.

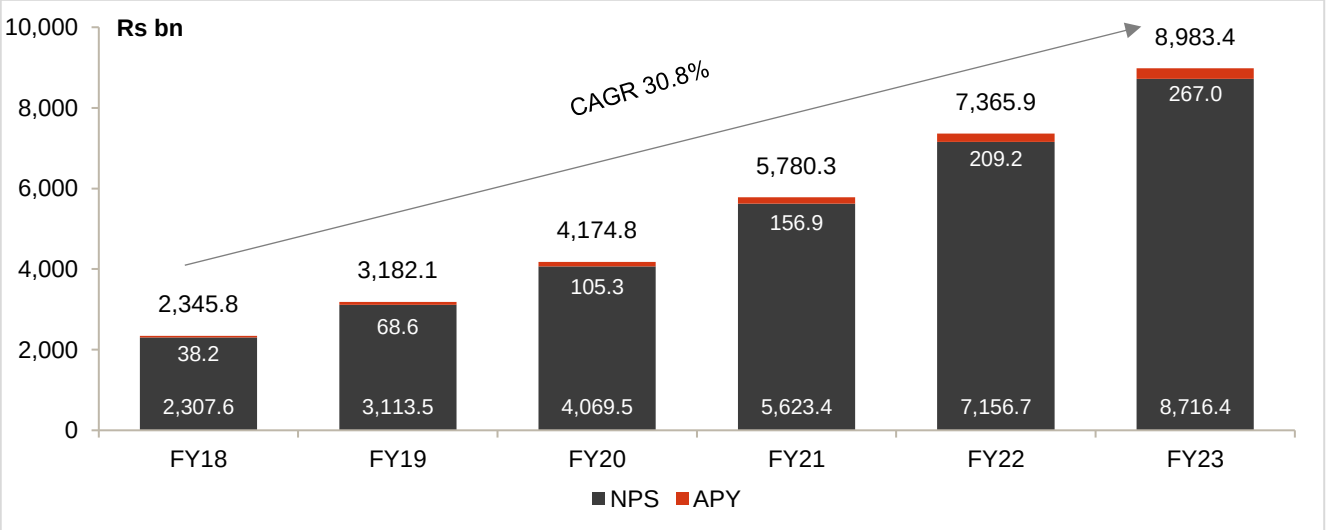
Number of NPS, APY subscribers (in million)



Source: PFRDA, CRISIL MI&A Research

The NPS has been made available to every citizen from May 1, 2009, on voluntary basis. More than 14 million have enrolled for the scheme ever since. During the last five fiscals ending fiscal 2023, NPS subscriber base has grown at a CAGR of 8%. The APY has found traction right from the beginning. As the unorganised sector has a huge workforce, the number of APY subscribers is now more than twice of the NPS. Combining subscriber base of both, NPS and APY, the number of subscribers grew at a CAGR of 24.4% during FY18 to FY23. However, given the country's huge population (the second largest after China) both the pension schemes stand grossly underpenetrated.

Assets under management of the NPS, APY (in Rs billion)



Source: PFRDA, CRISIL MI&A Research

Asset under management (AUM) of the NPS has been growing robustly. Over the past five fiscals, its AUM base clocked a robust growth of 30.4% CAGR. The PFMs authorised by the PFRDA manage these assets. Although the number of subscribers under the APY is more than double that of the NPS, the ticket size in under it is very small. Hence, the AUM of APY is minuscule in comparison with that of the NPS. The combined AUM of NPS and APY is Rs 8.9 trillion as of fiscal 2023.

9.5 Growth drivers for national pension system initiative

Government's push for widespread acceptance of NPS

The NPS has crossed some key milestones in the past few fiscals as its number of subscribers and AUM saw robust growth. However, these numbers are still minuscule given India's huge workforce. Considering the lack of social security net for most of the employed and the looming risk of under-funded retirement, the government tweaked the product several times to make it more attractive.

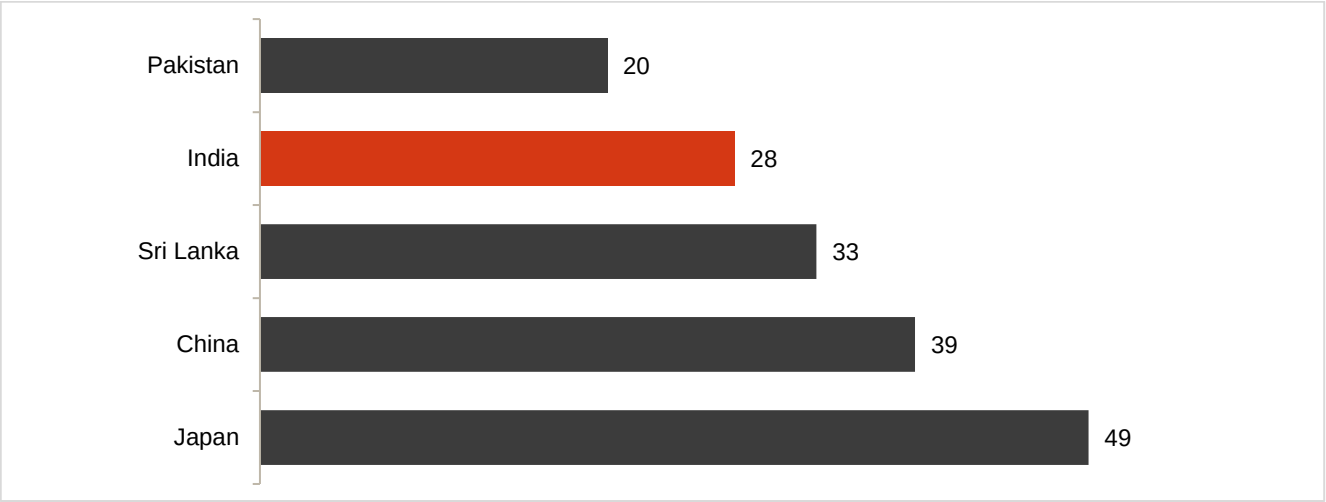
From a complex and heavily taxed product, the scheme has transformed into a more investor friendly one over the years. Relaxation in early withdrawal rules, flexibility to subscribers to stay on after 60 years of age and increase in tax exemption limit are some useful changes made by the government. Earlier NPS subscribers could withdraw only 40% of the corpus tax free. This government increased this to 60%. To make the on-boarding and transaction process hassle-free, the government introduced electronic account opening and direct remittance of contributions.

To make the scheme more competitive than PPF, NPS allows an additional deduction of Rs 50,000 under Section 80CCD (1B), over and above Rs 1.50 lakh that can be claimed under Section 80C. Additional tax benefit is available to subscribers under corporate sector, under section 80CCD (2) of Income Tax Act. Employer's NPS contribution (for the benefit of employee) up to 10% of salary (Basic + DA), is deductible from taxable income, without any monetary limit. Corporates can claim deduction on their contribution towards NPS up to 10% of salary (basic + dearness allowance) as business expense from their profit and loss account. Along with that, with certain limitations, the subscribers get the option to strategically allocate funds between equity and debt unlike PPF making the NPS investment option more attractive.

India's large young population base favourable for NPS penetration

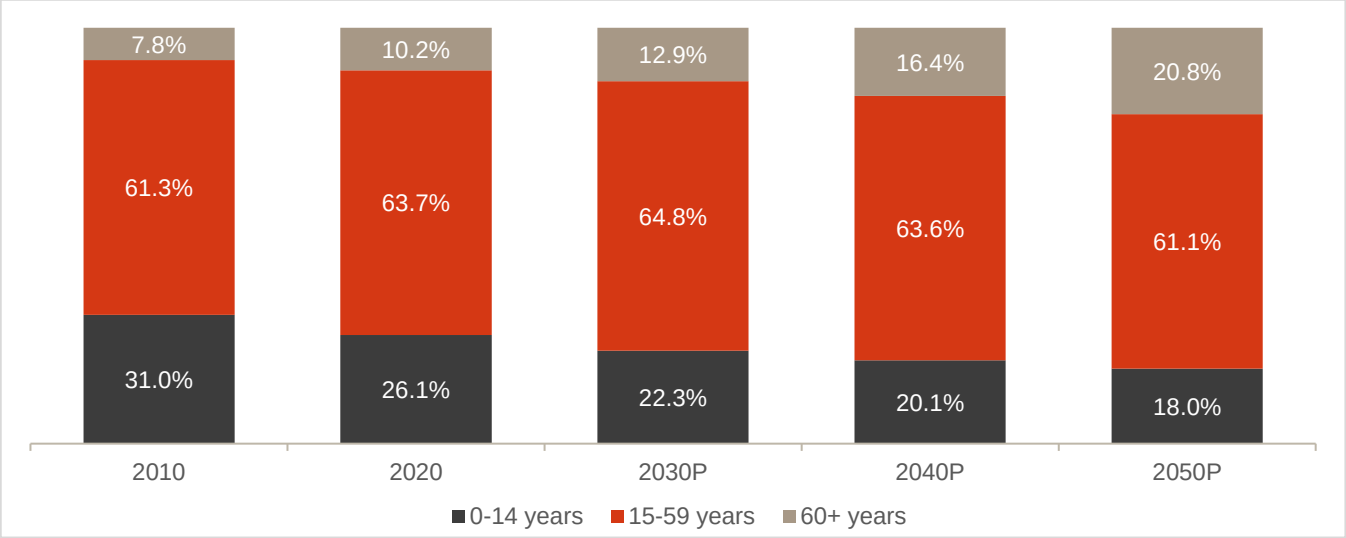
Demographically, India is in a sweet spot today. With the median age of its population at 28 years, it is a young country (for China, this is 39). Of India's population, more than 60% is in the working age group. It is expected to remain so over the next decade as well. With increasing awareness of retirement products among the youth, NPS poses strong potential to penetrate further from current level.

Median age of South and Southeast Asian countries (2022)



Source: United Nations' World Population Prospects 2022, CRISIL MI&A Research

India's age group wise population distribution

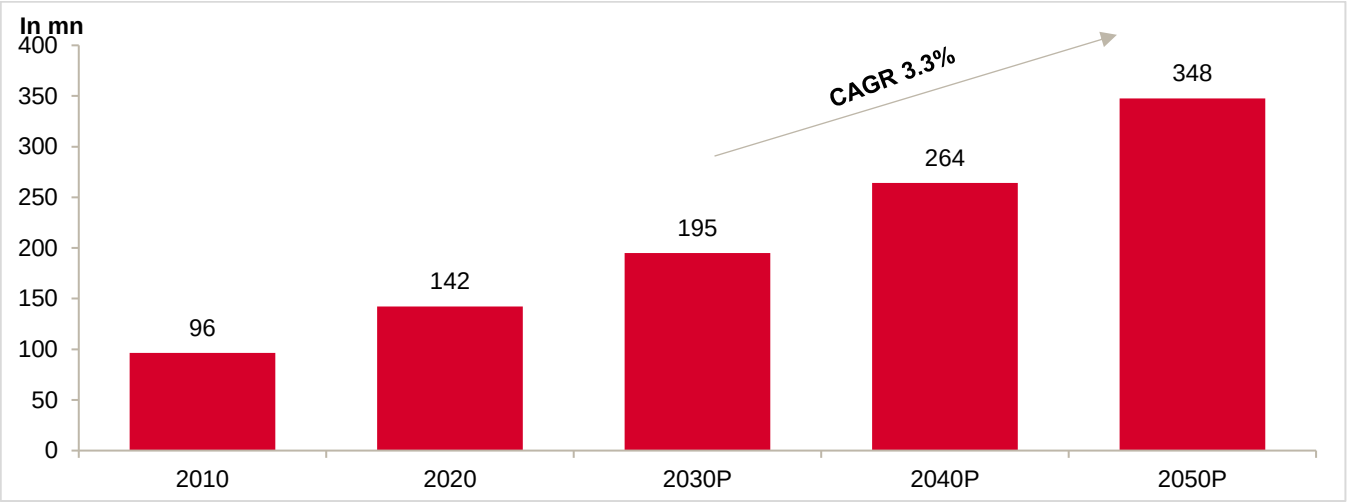


Source: United Nations' World Population Prospects 2022, CRISIL MI&A Research

In the next three decades, share of elderly will double

Buoyant as India's demographic profile appears today, the median age of its population is expected to increase to 38 by 2050 from 28 as of 2022. The population of the elderly – or those aged 60 and above – is expected to increase to ~348 million by 2050, logging a CAGR of 3.3%.

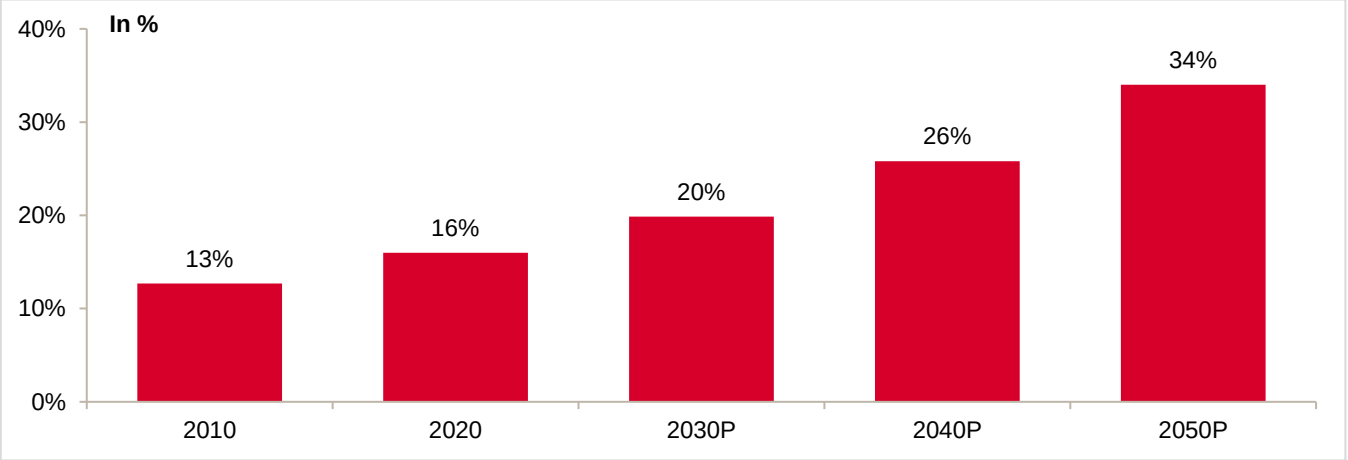
India's population above 60 years (in million)



Source: United Nations' World Population Prospects 2022, CRISIL MI&A Research

With increasing elderly population, the old-age dependency ratio is expected to increase to over 30% by 2050 from 16% in 2020.

Old-age dependency ratio



Source: United Nations' World Population Prospects 2022, CRISIL MI&A Research

Traditionally, Indians rely on family support in post-retirement years – a phenomenon termed as pillar zero in the World Bank's five-pillar pension framework. But this cushion is withering away as families go nuclear. Though life expectancy is lower compared with most Asian peers, a low retirement age in India lengthens the sunset period, bolstering calls for better pension planning.

Retirement age and life expectancy at 60 years

Country	Retirement age (men)	Retirement age (women)	Life expectancy at 65 years, 2021	Life expectancy at 65 years, 2050
Bangladesh	59	59	15.7	19.3
China	60	55	17.7	21.4
India	**58**	**58**	12.7	18.5
Indonesia	65	65	12.1	16.0
Japan	65	65	22.4	25.2
Pakistan	60	55	12.8	14.4

Philippines	65	65	12.6	16.4
Republic of Korea	65	65	21.5	24.0

Source: United Nations' World Population Prospects 2022, CRISIL MI&A Research

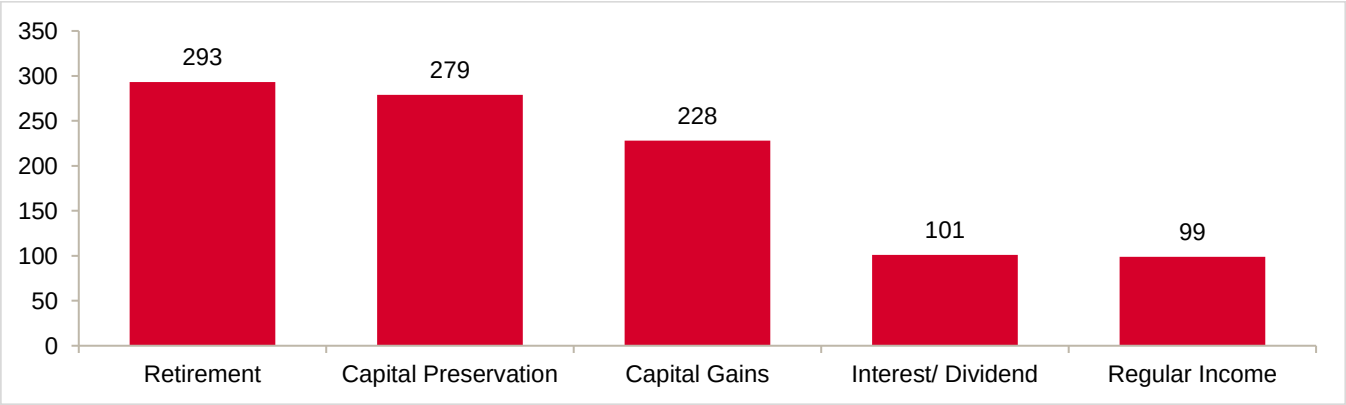
India's pension market remains grossly underpenetrated at the moment. In 2003, the PFRDA was established with aim to promote, develop and regulate the pension sector in the country. The NPS introduced in 2004 was initially the default retirement scheme for central government employees but was extended to all citizens in 2009. As mentioned earlier, the government has amended the scheme many times to make it more lucrative for the masses. Demographically India's working age population base is expected to remain above 60% for one more decade. Given the government's push to pension products and favourable demography, the NPS is expected to gain more subscribers going forward.

Awareness of retirement planning among investors

One of the key mandates of securities markets regulators, which extend beyond their supervisory function, is to inspire confidence, strengthen infrastructure and improve participation rates in the securities markets. To examine, the ground realities, Securities and Exchange Board of India (SEBI) conducts investor survey. SEBI Investor Survey 2015 (SIS 2015) was fourth iteration of a periodic SEBI investor survey. The survey was developed to identify and understand investor perceptions regarding investment choices and savings instruments and to probe further into the decision-making processes of non-investors, particularly by attempting to understand their non-participation in market instruments and their approaches to saving. Among many subsets for data collection, one group was subset of market participants (MPs). The MP survey included responses from a total of 1,016 respondents, 100 brokers, 311 Sub-Brokers, 305 Authorized Persons (AP), 90 Depository Participants (DP) and 210 Mutual Fund Agents (MFA) from across the country.

According to MPs, those engaging their services use it primarily for retirement. This might be an effect of the average age of investors using the services of financial intermediaries, that is, younger groups do not engage intermediaries and invest on their own, while those who do engage these intermediaries are older and this have a retirement focus. But this data shows a strong interest for retirement planning among people with above average age. With growing financial literacy, a large proportion of the population is expected to opt for beneficial pension programs such as NPS.

Reasons for clients to invest in securities markets



N = 1,016 (Market Participants)

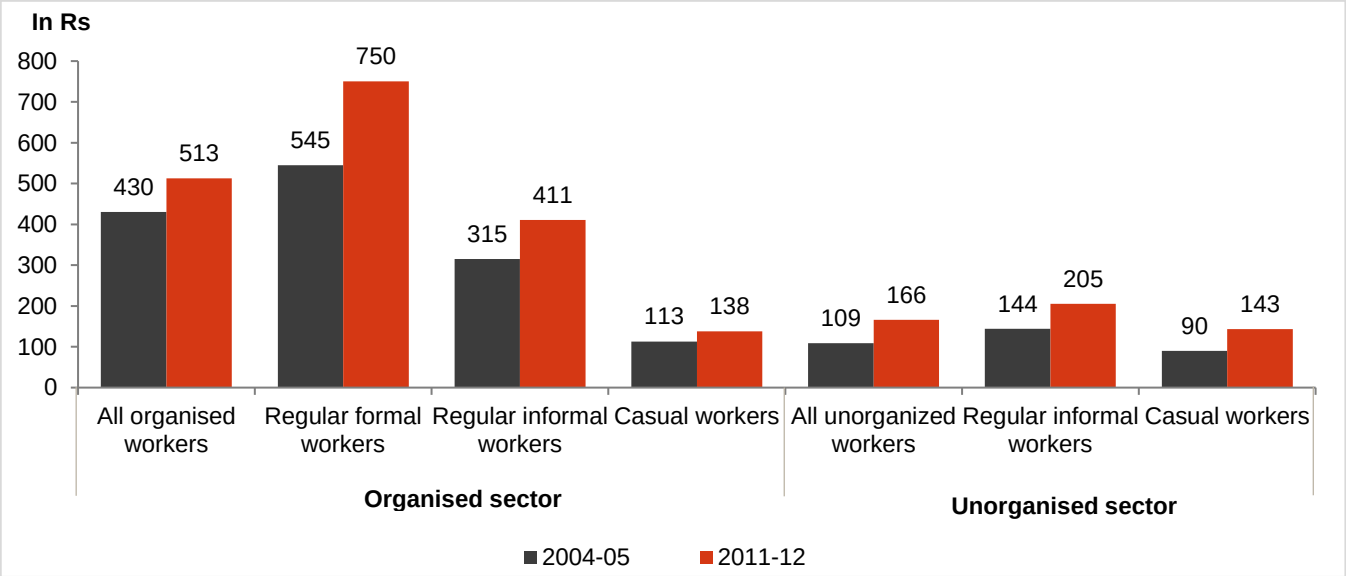
Source: SEBI Investor Survey (SIS) 2015

Strong growth prospects for APY

Typically, pension systems across the world cover the formal or organised sector of the economy, while the informal sector is largely ignored. In developing countries, this is a bigger concern than the developed peers as workforce in the sector is much larger.

As the following chart shows, income of a regular formal worker is nearly four times that of a regular informal worker. Hence, formal workers get both higher pay and better social security benefits such as contribution towards pension. Informal workers usually have no buffer for retirement as their low pay doesn't allow them to keep any.

Organised, unorganised segment workers in India



Source: ILO- India wage report

The finance minister in his budget speech in February 2019 had estimated unorganised sector workers at around 420 million workers. This includes street vendors, rickshaw pullers, construction workers, rag-pickers, agricultural workers, beedi workers, etc.

The APY was launched (announced in Union Budget 2015-16) to address their longevity risks and to encourage them to voluntarily save for their retirement. As of March 2023, the scheme has over 45.9 million subscribers, which forms of a small proportion of the workforce in the sector.

The APY has a simple structure, which makes it easy to understand for anyone who wants to open an account under the scheme. All major banks offer the product to their customers, making it accessible to anyone. The scheme offers guaranteed pension depending on the subscriber contribution and offers tax benefits too. Due to the benefits the scheme offers and the huge market to tap into, the APY has strong growth prospects.

10 Assessment of Aadhar authentication, e-KYC and e-sign in India

10.1 Overview of Aadhar and its uses

An Aadhaar is a unique 12-digit figure issued by the Unique Identification Authority of India (UIDAI) to residents of India after meeting certain identification conditions structured by UIDAI. It was launched in the year 2009 with the intent to provide universal identity to every individual, after collecting user biometrics such as iris scan and fingerprints, and demographic information, such as birth date and address. The UIDAI is responsible for managing Aadhaar numbers and developing and setting up the necessary infrastructure for issuing Aadhaar cards.

Any person residing in the country, regardless of age and gender, and is a resident of the country, may voluntarily enrol to have his or her Aadhaar number. Aadhaar enrolment is done only once and is valid for the entire life. Aadhaar is a random number that does not have any intelligence and thus does not profile individuals based on their religion, caste, income, geography, and health.

The Aadhaar project started as an attempt to create a single unique identification number or document containing all details of Indian residents. Currently, there are many forms of identification in the country, such as Permanent Account Number (PAN), passport, driver's license, ration card, etc. Aadhaar does not replace them but can be used as the sole proof of identity (and address). It serves as the basis for Know Your Customer (KYC) standards used by financial companies, telecommunications companies, and other companies that maintain customer profiles.

Predominant uses of Aadhar card are as follows:

Availability of subsidies:

The Aadhaar scheme is primarily aimed at improving the delivery of social security benefits and subsidies, plugging leakages and wastes, eliminating fakes and duplicates, and enhancing transparency and accountability.

The Aadhaar project has been linked to some public subsidy and unemployment benefit schemes such as the domestic LPG scheme. In these Direct Benefit Transfer (DBT) schemes, the subsidy money is directly transferred to a bank account which is Aadhaar-linked. This also refutes the opportunity of the funds being misused or any person attempting fake claims to get the benefits. The scheme also gives the Government precise data on its beneficiaries and permits the government and other service providers to synchronize and enhance many schemes.

Aadhaar can be used in the delivery of the following programs:

- **Food & Nutrition** – Public Distribution System, Food Security, Mid-day meals, Integrated Child Development Scheme.
- **Employment** – Mahatma Gandhi National Rural Employment Guarantee Scheme, Swarnajayanti Gram Swarozgar Yojana, Indira Awaaz Yojana, Prime Minister's Employment Guarantee Program
- **Education** – Sarva Shikhsha Abhiyaan, Right to Education (Children between 6 to 14 years under Sarva Shiksha Abhiyan, likewise, shall not require mandatory Aadhaar enrolment)
- **Inclusion & Social Security** – Janani Suraksha Yojana, Development of Primitive Tribe Groups, Indira Gandhi National Old Age Pension Scheme
- **Healthcare** – Rashtriya Swasthya Bima Yojana, Janashri Bima Yojana, Aam Aadmi Bima Yojana

Other miscellaneous purposes such as property transactions

Limiting leaks by targeted distribution:

Aadhaar aids in identifying the beneficiaries, it helps in limiting the extra outflows and making sure that services are being distributed to the intended beneficiaries.

Improving competence and efficacy:

By making better use of the workforce involved across service delivery networks, governments can further develop distribution mechanisms and use scarce expansion funds more efficiently and competently.

Availing facilities by service agencies:

By using Aadhaar, the process to avail services has becomes relatively easy and hassle-free Services such as opening of bank accounts, Jan Dhan Yojna, procurement of passport, claiming provident fund and many more can

10.2 Overview of e-KYC and its uses

Know Your Customer abbreviated as KYC is process undertaken for the purpose of authenticating the identity and credentials of a beneficiary or a customer. E-KYC process often referred to a paperless KYC, is the process through which verification of customer credentials are done electronically. In India, e-KYC norms are laid down by Reserve Bank of India.

UIDAI has launched Aadhaar paperless offline e-KYC verification to allow Aadhaar number holders to voluntarily use it for establishing their identity in various applications in paperless and electronic fashion, while still maintaining privacy, security, and inclusion.

UIDAI provides a mechanism to verify identity of an Aadhaar number holder through an online electronic KYC service. The e-KYC service provides an authenticated instant verification of identity and significantly lowers the cost of paper-based verification and KYC. E-KYC provides enhanced security in the authentication process. As customer identity is of utmost importance, UIDAI has permitted only select organizations and agents to carry out e-KYC verification services. Hence, the customer can stay assured the provided information will not be misused or end up in possession of those with malicious intent. E-KYC also doubles up on the effort to identify and prevent theft and financial fraud. With provision of biometric verification, it is among the safest customer verification provision to exist.

e-KYC services are majorly used in situations where service providers need to verify the authenticity of details provided by the customer. Following are the list services (non-exhaustive) where e-KYC is used for better delivery:

- Authentication for account opening at banks
- Authentication for new telecom connection
- Authentication for opening of investment account
- Authentication for credit disbursal by financial institutions
- Authentication for e-sign

Outline of e-KYC Authentication eco-system

Unique ID or electronic ID places a key role in e-KYC authentication system as it enables to verify data provided by the individual against existing data stored in repository maintained by public or private entity. Initially, in the e-KYC authentication process individuals provide ones Unique ID to the requesting entity through Authentication devices. The requesting entity then sends the Unique ID provided by the Individual to the service entities in an encrypted format. These service entities act as intermediaries between requesting entity and repository by providing infrastructure and secured connection to access repository database. Data received from services entities is cross verified against existing data at the repository. Later, repository sends a authentication response or details for the unique ID provided based on service requested back to service entities which in turn flows to requesting entities.

Aadhaar based Authentication

In India, Unique Identification Authority of India (UIDAI) facilities the authentication through online using demographic and biometric data. The unique identification number (UIN) or Aadhaar which is assigned on an individual level helps in establishing the identity of individual to public or private enterprises. The implementation of the Aadhaar has led to a revolution in authentication and consequently in monitoring & security, credit ecosystems, payment systems, and direct benefit transfers (DBT).

Aadhaar Authentication services

Aadhaar authentication services which are used to validate user identity are divided into two types

- Yes/ No Authentication
- e-KYC authentication

Yes/ No authentication: UIDAI has started this service as of February 2012. Under these services the requesting entity would send demographic or biometric or One Time Password (OTP) of the Aadhaar holder to UIDAI in an encrypted format. UIDAI through its Central Identities Data Repository (CIDR) validates the details against data stored with it and returns a yes or no response

e-KYC based authentication: In this service, requesting entity would send the Aadhaar card holders demographic or biometric or One Time Password (OTP) to UIDAI in an encrypted format. After validation of the details against CIDR, UIDAI would send signed e-KYC authentication response which contains Aadhaar card holder e-KYC data in an encrypted format

Key stake holders involved in Aadhaar Authentication

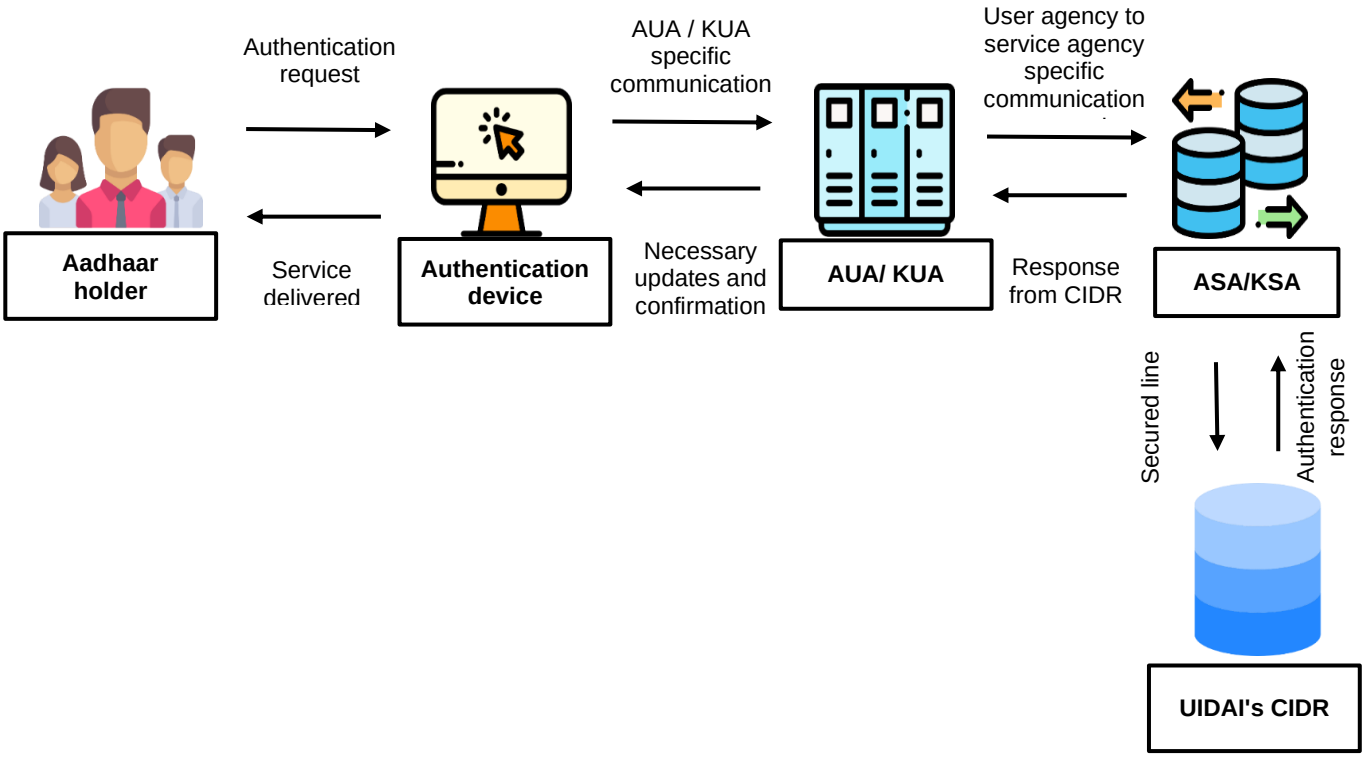
Aadhaar number holder: It refers to an individual to whom Aadhaar has been allotted under Aadhaar Act

Aadhaar service agencies (ASA)/ KYC service agencies (KSA): ASA/KSA are agencies that have established a secured connection with CIDR in compliance with standards set by UIDAI. These agencies offer UIDAI- connectivity network as a service to AUA / KUA. Entities that are appointed or to be appointed as ASA/KSA should comply with conditions under schedule B of Aadhaar act 2016. KSAs are ASAs using their network can provide access to e-KYC service.

Aadhaar user agencies (AUA)/ KYC user agencies (KUA): AUA/ KUA are requesting entities that use authentication to provide services to their customers. They interact with CIDR through ASA/KSA. (Either by becoming ASA/KSA on its own or through entering contract with other ASA/ KSA). KUAs are AUAs that provide access to e-KYC service to the end user.

Central Identity Data repository (CIDR): It is a centralised database by UIDAI in one or more locations and contains all the demographic and biometric information along with Aadhaar numbers of Aadhaar holders.

Overview of process flow for Aadhaar authentication



Source: UIDAI, CRISIL MI&A Research

Benefits of e-KYC

Cost reduction

e-KYC being an electronic based authentication system, reduce the necessity of managing documents as in paper-based authentication system. Also, e-KYC requires less manpower when compared to older ways authentication. Being electronic based and requiring lesser manpower would in turn reduce the cost generated by the company.

Instantaneous

The process of e-KYC is completely done online which enables real time transfer of data during the KYC process. This means manual intervention that is required is minimal. Due to this, e-KYC process would be completed in minutes whereas the manual KYC process would take weeks to be done.

Prevention of fraud

During the E-KYC, UIDAI shares the demographic and biometric details of the individual for whom the request is raised. These data is shared through secured channels eliminating the chances of data manipulation thereby reducing malpractices such as fraud, identity fraud etc.

Improved operational efficiency

In this age of digital technology, Institutions under the necessity to go digital in order to better customer experience and improve regulatory compliance. Integration of e-KYC into businesses would reduce the turnaround required for on-boarding a customer and provide customer support easy and accurate manner. This in turn would improve operational efficiency of the company.

10.3 Overview of e-sign and its uses

Electronic signature (E-sign) is a service through which electronic signing of documents can be done in easy, efficient, and secured manner. E-sign is provided by authenticating signer using e-KYC services. Using this service any e-sign user can sign the documents electronically without the requirement for physical documents. This process would reduce turn-around time required for processing requests.

These e-sign would be effectively applicable in situations where requirement for signed copies to be submitted exists. Agencies who are obtain major benefit from e-sign services are those who accept large number of signed documents from their users. Following are services where E-sign service can create efficiency:

- Self-attestation for Digi locker
- Application for e-tax filing
- Application for account opening at banks
- Application for issue and reissue of passport
- Application for new telecom connection
- Application for various certificates such as birth, caste, marriage, income etc.
- Application for driving license renewal, vehicle registration
- Application for enrolment in exam or courses
- Submission of parliament questions by member of parliament

Note: Some of these use-cases may be under implementation or to be implemented in future.

Outline of e-sign eco-system

Integration of E-sign can be done with various service delivery applications to ease digital signing of documents by obtaining verification through e-KYC of e-sign user. Authenticated responses received against e-KYC services with respect to e-sign users is used to apply the digital signature.

In the e-sign process, Application service provider (ASP) which provides e-sign as a service would send the request raised by the end user to the e-sign provider (ESP). Upon receiving the request from ASP, e-sign provider invokes the request for e-KYC of the end user through e-KYC service provider. Authentication of end-user details are done through biometric, or One Time Password (OTP) received on mobile. On authentication, ESP sends the end user request along with e-KYC verification details to Certifying authority for obtaining certification. Based on e-KYC details received, certifying authority issues Digital Signature Certificate (DSC) which is then sent to ESP. Once received, ESP forwards the certificate to the end user for acceptance. After the acceptance, electronic signature is created and is attached to the document electronically.

Key stake holders in e-sign eco-system

End user: Individual request for e-sign procedure and under scope of IT act an end user shall also be 'applicant/e-Sign User for digital certificate'

Application service provider (ASP): Uses e-sign as a service to digitally the sign documents. These providers get into contract/ agreement/ undertaking with e-sign providers

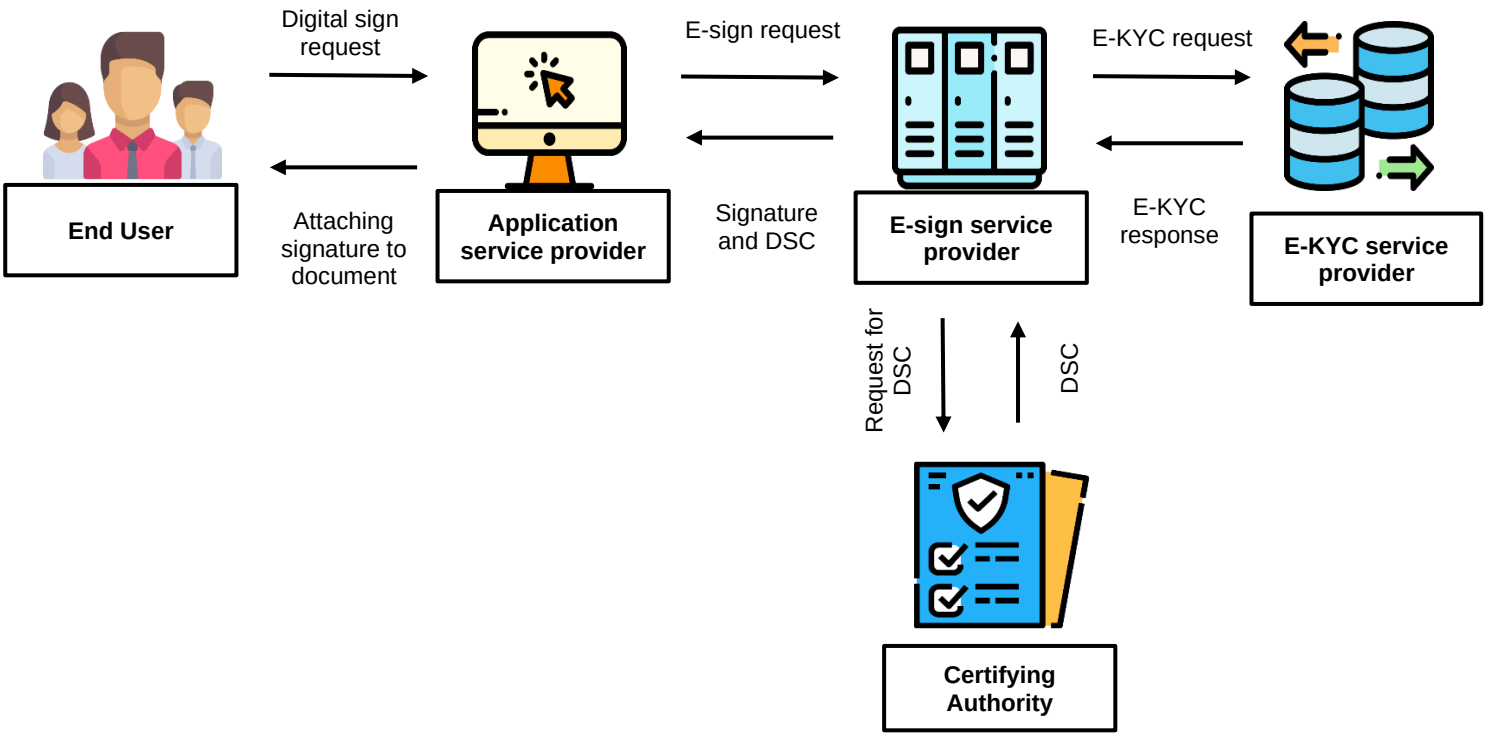
E-sign provider: It provides e-sign service and is a "trusted entity" as per schedule two of Information technology act. An e-sign provider must be either a certifying authority or must be in agreement with the certifying authority to provide digital certificates for the end user

Certifying authority: For creating an electronic signature, end user needs to obtain Digital Signature Certificate (DSC) from the certifying authority (CA). These certifying authorities are licensed by the Controller of Certifying Authorities (CCA) under the Information Technology (IT) Act, 2000. Before a CA issues a DSC, the end user must be verified through E-KYC.

e-KYC service provider: e-KYC service provider would validate the details of the end user against already existing details in UIDAI's CIDR repository.

Control of certifying authorities (CCA): Issues licenses and regulates the Certifying Authorities (CA).

Overview of process flow for E-sign



Source: Controller of Certifying Authorities, CRISIL MI&A Research

Potential of E-sign

The major value proposition of e-sign is to enable an Aadhaar or PAN card holder to sign a document at any time, from anywhere and through any device. Users can affix their electronic signature on a digital document by authenticating through E-KYC services or biometrics. The advantage of E-sign is extended not only to individual customers but also to businesses and enterprises. In Indian context, e-sign forms a key element in Government of India's, Digital India Program.

E-sign facilitates its providers a means to move from paper-based signature by integrating e-sign service within their applications and thus forming a key component in paperless environment. Financial Institutions are currently using e-sign in order to process various services such as account opening, credit disbursal and on-boarding new employees etc. From an organisation standpoint, e-sign can enhance the ease of doing business. It can improve the customer and vendor on-boarding process and perform online transactions with an ease. This can reduce cost involved and fasten the turnaround thus improving the overall experience.

In India, E-sign services are provided by third party service provides licensed under the IT act and are governed by e-authentication guidelines making them secure, advantageous and cost-effective method.

E-sign also acts a viable option for development of E-governance infrastructure and its penetration. E-governance is a platform where various services offered by the government are conducted through online channel. In such online transaction and services, E-sign is used to authenticate and authorise transactions with end users, while maintaining security and confidentiality. In addition to that, current systems, where physical presence is required for authentication, are not completely suitable for mass adoption. However, with growing internet penetration, a service such as e-sign can be scalable for a large set of population in providing fully paperless E-governance services and increasing efficiency of government services. Financial institutions can also provide various services online by using e-sign for authentication in turn increasing number of digital transactions.

10.4 Aadhar card charges

Services	Assistance paid to registrars (in Rs.)	Fee to be collected from residents by service provider (in Rs.)
Aadhar generation of residents in 0-5 age group (ECMP or CEL client enrolment)	50	Free of cost
Aadhaar generation of residents having more than 5 years of age	100	Free of cost
Mandatory biometric updates	100	Free of cost
Other biometric updates (with or without demographic updates)	-	100
Demographic update (update of one or more fields/online mode or through Aadhaar centre using ECMP/CELC)	-	50
PoA/PoI document update at Aadhaar enrolment centres	-	50
Aadhar search using eKYC/Find Aadhar/any other tool and colour print out on A4 sheet	-	30
PoA/PoI document update through SSUP (myAadhaar) portal	-	25
Aadhar card linkage with PAN card	NA	1,000*

ECMP: Enrolment Client Multiple Platform
CELC: Child Enrolment Lite Client
PoA: Proof of Address
PoI: Proof of Identity
NA: Not available
**From 1st July 2022, the charges were revised from Rs 500 to Rs 1,000*
Source: UIDAI, CRISIL MI&A Research

10.5 Growth drivers for authentication transactions

Source: CRISIL MI&A Research

Aadhaar enabled e-KYC to reduce the physical paper submissions required

Aadhaar verification lies at the centre of availing many financial services in the country. These verifications were time consuming and involved lot of paper-based submissions earlier. However, UIDAI has launched electronic KYC mechanism to verify the Aadhaar card holder. This provides quick verification of Aadhaar holder credentials and majorly reducing the cost of paper-based verifications. Seamless authentication and e-KYC services have led to a growth in the credit economy through simple and easy authentication processes based on Aadhaar.

In addition to this, UIDAI has introduced Aadhaar paperless offline e-KYC verification for areas where online e-KYC may not be possible. Same as online e-KYC, this process also enables users to establish their identity in paperless manner. E-KYC being an electronic based authentication system, reduces the necessity of managing documents as in paper-based authentication system, leading to a reduction in carbon footprint

As these services are majorly based on usage of electronic devices such as mobile phones, etc. reduces the physical paper submissions and in turn reducing the cost involved.

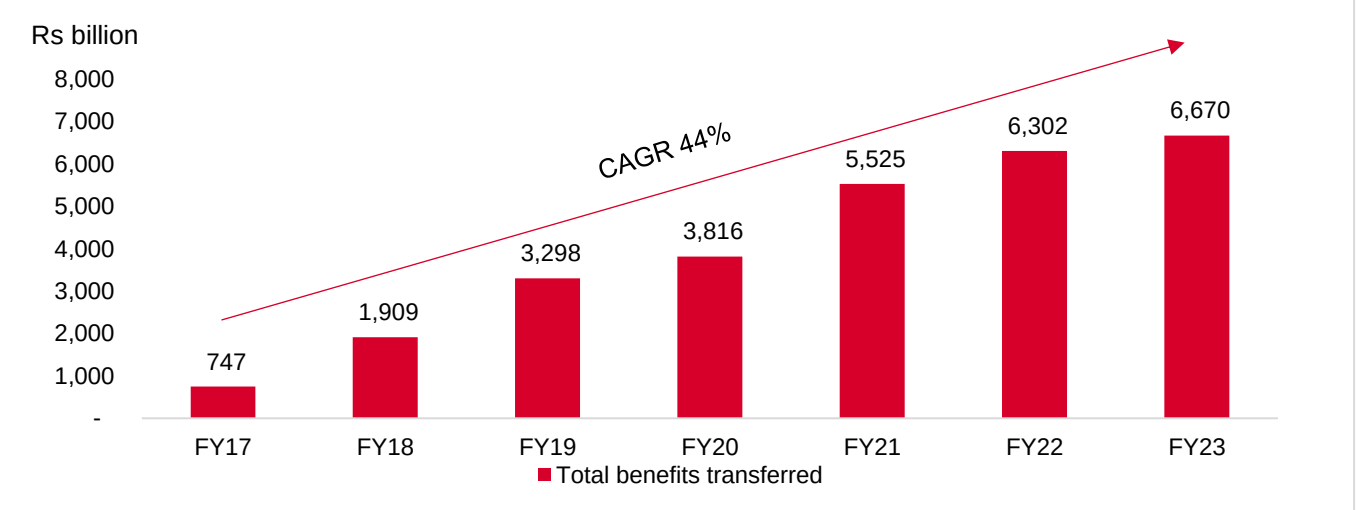
Direct benefit transfer scheme to aid further growth in e-KYC requirement

The major aim of Direct Benefit Transfer (DBT) lies in transferring of subsidies provided by the government directly to bank accounts of the beneficiaries. Through this scheme, government envisages to reduce the delay in payments and accurately target beneficiaries. Aadhaar based services have ensured accurate targeting of the beneficiaries by reducing frauds, enabled portability, eliminated diversion of Public Distribution System benefits, reduced manual intervention, ensured faster delivery of LPG cylinders, and facilitated access to digital services of the government. In

order to reduce the leakages and duplication, these targeted beneficiaries are authenticated using Aadhaar e-KYC as Aadhaar acts as unique identity for its holder. Jan Dhan account, Aadhaar and Mobile (JAM) act as the major pillars for this program. With issuance of JAM, the government was able to improve its focus to provide easy access of banking facilities and enhance ability to digitize transactions. This expanded use of digital payments by the government for welfare and served as the launchpad for DBT.

As of FY23, government has transferred Rs. 6.7 trillion which has grown at a CAGR of 44% from FY17. Going forward, increase in number of beneficiaries would further propel the requirement for e-KYC processes and e-KYC infrastructure.

Amount of DBT over the years



Source: DBT, CRISIL MI&A Research

Increasing digital transactions to drive the e-KYC infrastructure growth in the country

Lead by change in consumer behaviour caused due to demonetisation in the country, the number of cash transactions as a % of total transactions have seen a gradual decline over the years. As of 2020, most of the transactions occur digitally due to ease of performance and convenience. Digital transactions have seen a rise from 39% of total transactions in FY16 to occupying a large pie of 97% in FY23. In volume terms, number of digital transactions have increased from 6.3 billion in FY16 to 113.9 billion transactions in FY23 at a CAGR of 51%.

In addition, volume of UPI transactions has grown at a tremendous pace reaching 83.7 billion transactions in FY23. Volume of other digital payments transactions such as NEFT and IMPS have also grown strongly at a CAGR of 23% and 42% from FY18 to FY23.

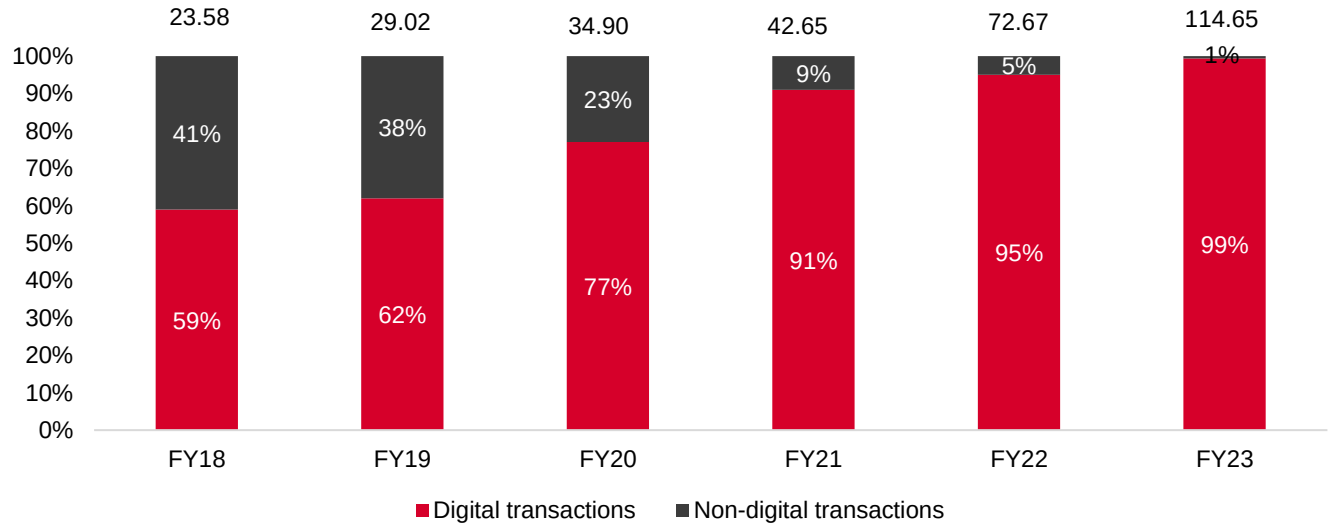
Aadhaar based services including e-KYC and e-Sign have assisted in shift from being a cash-dominated economy to a digital one. Most of digital payments such as UPI are linked to bank accounts which in turn require e-KYC process to be completed creation. In addition, to support digital payments and increase the financial inclusion in rural part of nation, Government of India has introduced Aadhaar enabled payment system (AePS) through which one can use Aadhaar linked bank account to process the transaction. For one to make payments through AePS, e-KYC is required. Financial inclusion in India is on rise. As per Reserve Bank of India's (RBI) Financial Inclusion (FI) Index survey, the annual FI-Index for fiscal 2021 is 53.9 as against 43.4 for fiscal 2017.

Financial Institutions are currently using e-KYC and e-sign in order to process various services such as account opening, credit disbursal and on-boarding new employees etc. This service enhances the ease of doing business as it improves the customer & vendor on-boarding process and perform online transactions with ease. It reduces cost

involved and fastens the turnaround time for processing of services. Going beyond payments Aadhaar stands to play a central role in enabling the consent architecture for data sharing under the Account aggregator framework leading to democratisation of credit through Open Credit Enablement Network (OCEN).

In future, growth in digital transactions coupled with government efforts are likely to increase financial inclusion which would drive the demand in e-KYC space for processing of applications.

Percentage share of digital transactions over the years



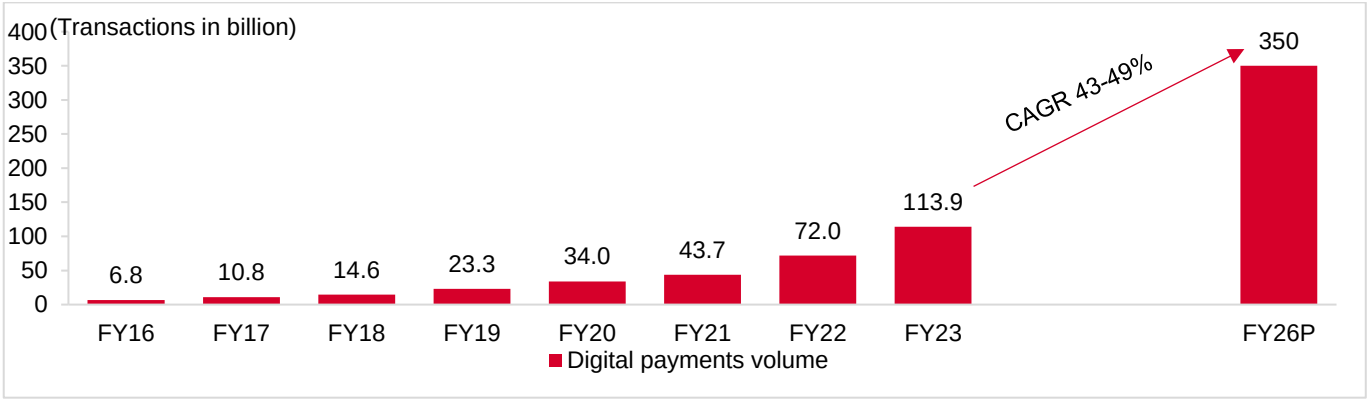
Note:

Digital transactions include RTGS – excluding interbank clearing, ECS, NEFT, IMPS, NACH, cards and prepaid instruments; non-digital transactions include cheques/paper clearing and ATM transactions. Amount above each bar indicates volume of transactions in the year.

Amount above each bar indicates total volume of transactions in that fiscal year.

Source: RBI, CRISIL MI&A Research

Digital transactions volume over the years

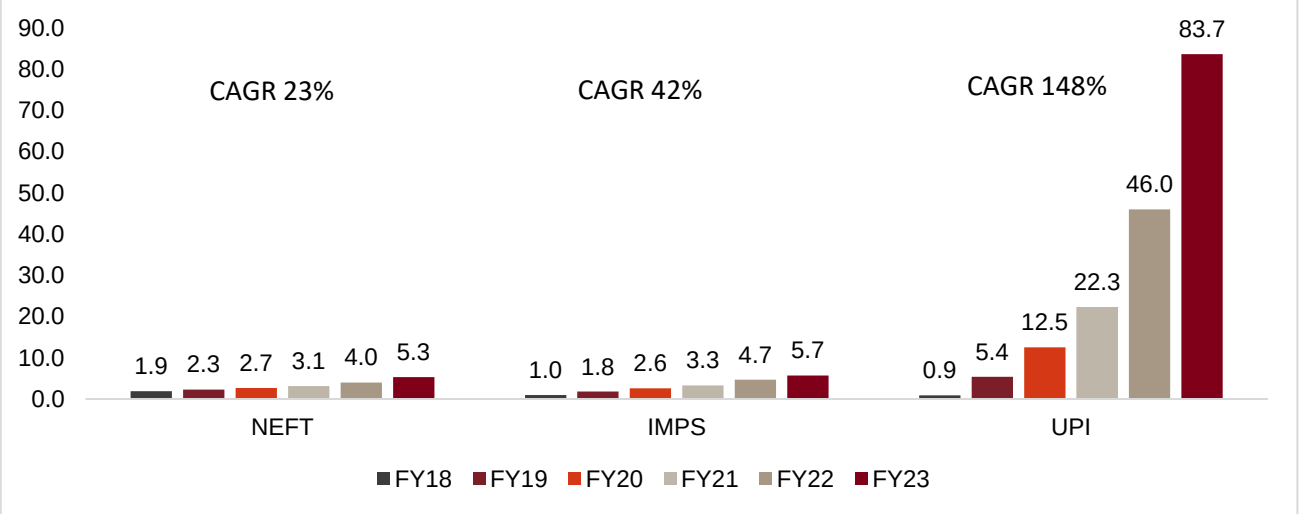


Note: Digital transactions include RTGS – excluding interbank clearing, ECS, NEFT, IMPS, NACH, cards and prepaid instruments

P: Projections

Source: RBI, CRISIL MI&A Research

Trend in volume of payments for NEFT, IMPS and UPI



Source: RBI, CRISIL MI&A Research

Growth in Digital economy to further push the need for e-KYC and E-sign infrastructure in the country

Technology plays a vital role in the development of an economy and provides a cost-effective solution for government solutions to untapped regions. Through Digital India Initiative, Government of India plans to transform India into digitally empowered economy. As economy moves towards digitisation, necessity arises for higher security needs especially in banking and investments space.

e-KYC being a better way to authenticate an individual's identity playing a vital role in this process. In addition to this, E-sign can also be used to digitally sign the documents concerning to government bodies, banking and financial institutions, educational institutions etc which would reduce time and cost involved. Development of infrastructure facilities for these e-KYC and E-sign services would further support growing digitisation in the country.

Requirement for authentication by various institutions likely to drive the growth in future

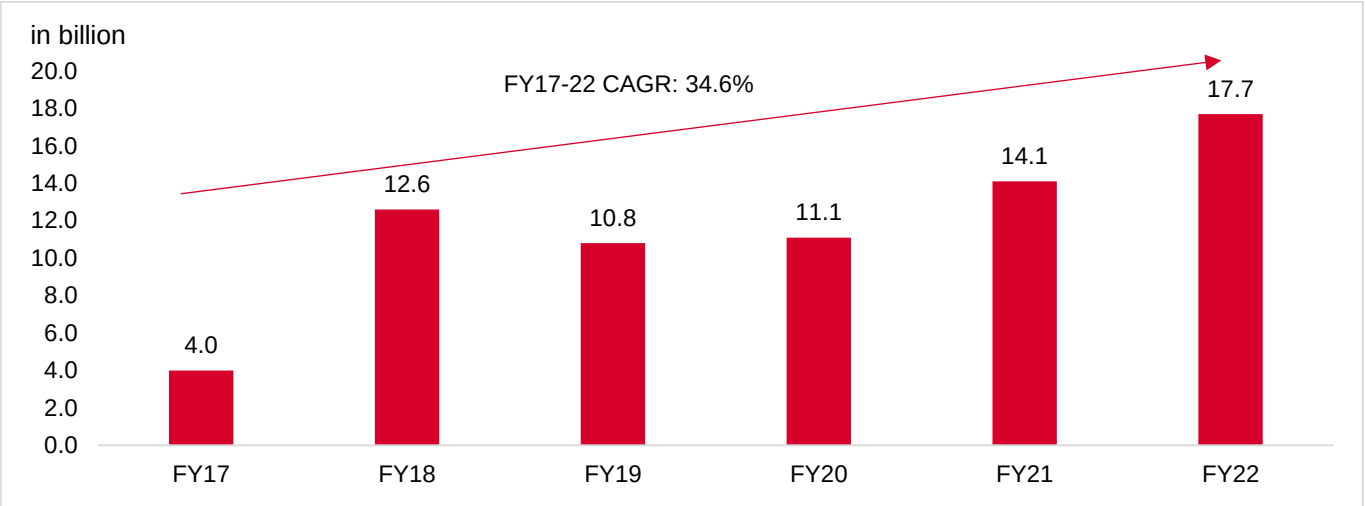
Number of authentications transactions have seen a growth over the years as it plays a major role for financial institutions in verification of individual identity.

Aadhaar authentication helps the credit disbursal agencies to easily validate documents provide by the beneficiary. As Aadhaar is necessary document to be submitted for availing of loan, authentication helps checking if duplicate proofs have been submitted thus reduce the operational risk for the entity. It also reduces the turn-around time required to avail the loan. Similarly, asset management companies opt for Aadhaar authentication for investments such as mutual funds which would provide easy and secure on-boarding of investors in less time frame.

In addition to these, it also has vital importance government initiatives such as Direct Benefit Transfer (DBT) and National Mission on Financial Inclusion.

Going forward, further growth in these spaces would in turn lead to raise in requirement for development in authentication infrastructure in the nation.

Authentication transactions over the years



Note: Above values include transactions from both yes/no authentication as well as e-KYC authentication

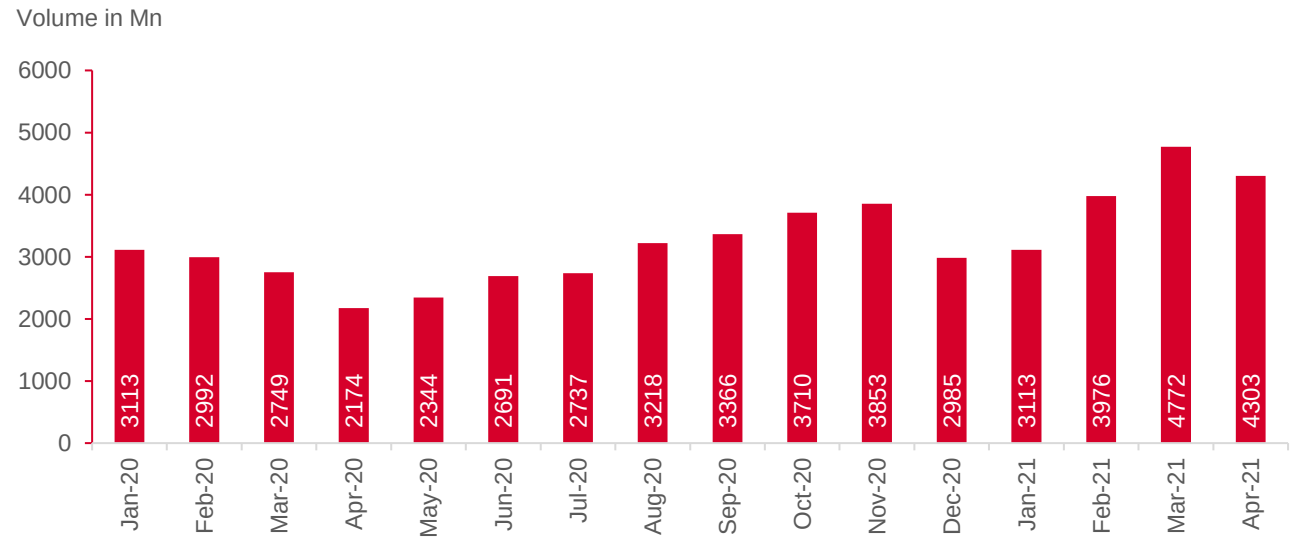
Source: UIDAI annual report, CRISIL MI&A Research

Impact of pandemic on digital payments

Pandemic has increased the pace of digital transformation of payments ecosystem in India. It not only propelled the use of technology based but also increased the number of product offerings in digital mode. Though number of digital payments saw a dip during the lockdown (2.1 billion transactions/month in April 2020), increased preference for contactless transactions during rest of the period has pushed to look for cashless alternatives. In addition to this, fintech players increased adaption to end-user needs digital payments has propelled the growth in digital payments reaching 4.3 billion transactions/month by April 2021 (97.9% Y-o-Y growth).

Further to enable, growth of digital transactions Reserve Bank of India (RBI) has also introduced 24*7 RTGS as of December 2020. Going forward, increase in digital payments is likely to create demand for e-KYC infrastructure.

Monthly trend in digital transactions volume (Jan'20 to Apr'21)



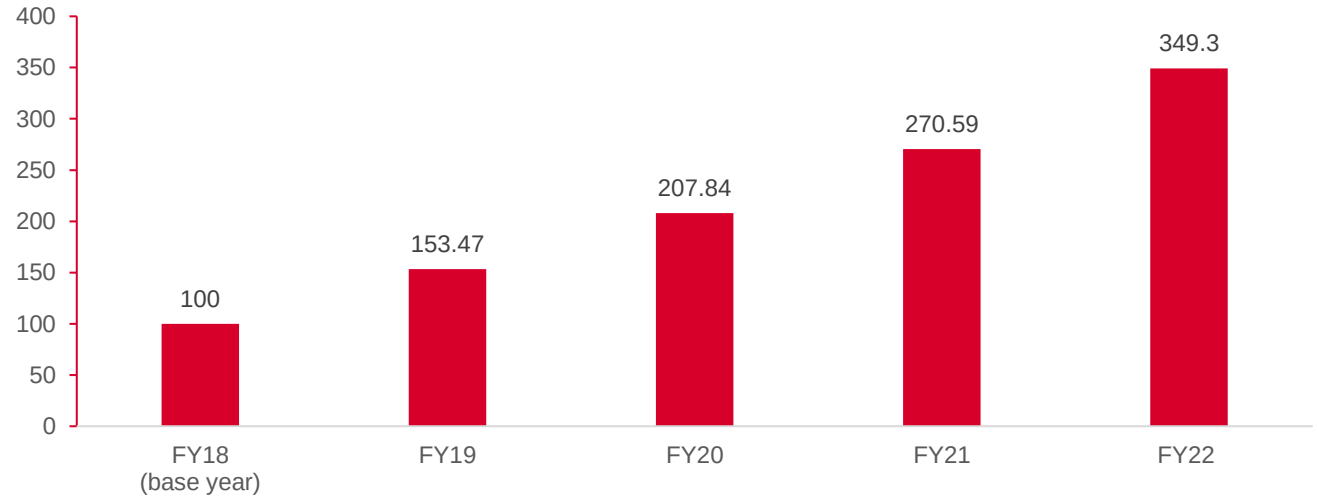
Source: RBI, CRISIL MI&A Research

Increasing digitals payments penetration to further boost requirement for authentication infrastructure

Digital payments lie at the core of digitalisation in the country, making it vital to understand its growth over the period. In order to capture this, RBI has developed a Digital Payment Index (DPI) covering wide range of payment ecosystems in India. It helps in understanding the penetration of digital payments across the country. In development of DPI, RBI has assigned five parameters with each having sub-parameters and weights assigned to it signifying the importance in payments ecosystem. With March 2018 as base period (=100), DPI has increased from 153.47 as of Mar 2019 to 304.06 as of Sep 2021 depicting the increasing penetration of digitals payments.

However, bank accounts linked to these payment interfaces require regular authentication done to reduce the occurrence of fraudulent activities creating necessity for better authentication facilities such as e-KYC to be in place.

Trend in Digital Payments Index (DPI)



Source: RBI, CRISIL MI&A Research

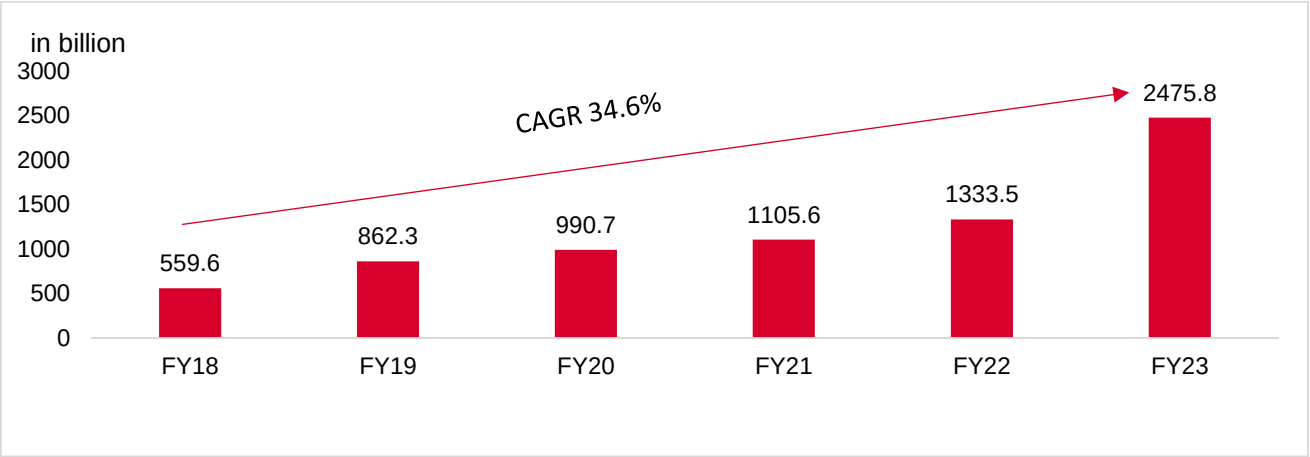
Aadhaar based credit disbursal system to support the future growth in e-KYC infrastructure

Aadhaar Bridge Payment System (ABPS) is setup by National Payments Corporation of India (NPCI). It is a unique payment system that uses Aadhaar or Unique Identity issued by UIDAI and IIN (Institution Identification Number) issued by NPCI to provide government subsidies and benefits to Aadhaar Enables Bank Accounts (AEBA) of beneficiates.

ABPS also serves the goal of inclusion in rural economy. It further enables transformation of large number of retail payments done into electronic mode thus serving the purpose of digital transformation. Number of credit transfer to beneficiaries through ABPS have grown at a CAGR of 34.6% from Rs. 559.6 billion in FY18 to Rs. 2,475.8 billion in FY23. In volume terms, ABPS transactions have grown at a CAGR of 6.6% from FY18 reaching 1,789.8 million transactions by FY23.

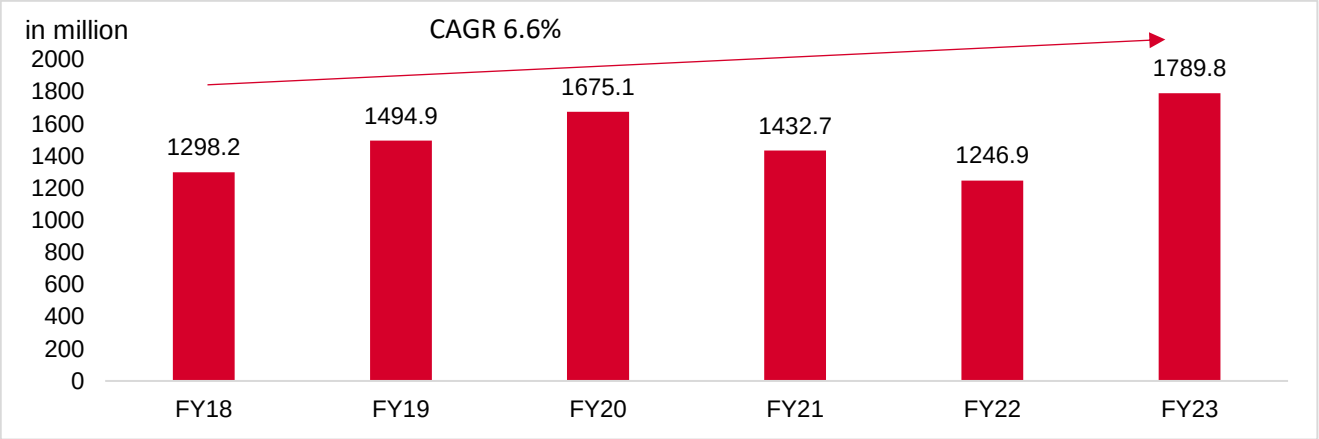
Going forward, with increase in financial inclusion and government taking measure to provide subsidies and benefits, creates a further dependence on e-KYC process for eliminating duplication, identity theft etc and in turn creating a demand for e-KYC infrastructure.

Trend in ABPS transactions (In Rs. Billion)



Source: RBI, CRISIL MI&A Research

Trend in number of ABPS transactions (In millions)



Source: RBI, CRISIL MI&A Research

Umbrella Entity for Retail payments to pave growth in e-KYC segment

Growth of Fintech companies in India are dependent upon penetration of digital usage, which in turn depends upon the infrastructure required, financial literacy and awareness among the population from both supply and demand prospects and having security protocols in place for data privacy and protection. Recent initiative by reserve for setting up of umbrella organization to look over the digital space is likely to increase the healthy competition among the players thus benefitting end users of the segment. As the competition intensifies leading to addition of new end users in the fintech space, e-KYC companies would also see demand increase lead by end-user authentication.

11 Overview of e-commerce retail industry in India

11.1 Evolution of e-commerce in India

In early 2000s, businesses started offering online services such as e-mail and instant messenger, along with information and entertainment content. Bulk of revenues of most such portals came from advertising. With search engines beginning to operate, content on the web experienced rapid scale up. With the advent of online ticketing system, e-commerce industry in India started taking shape. Back in early 2000s IRCTC started offering online bookings on its portal. During mid-2000s, India was getting introduced to multiplex cinema which gave space for online ticketing platforms. BookMyShow entered at the right juncture and became India's largest entertainment ticketing website. In 2007, product-based e-commerce in India started taking shape with Flipkart coming into existence. India's increasing internet penetration in the early 2010s along with launch of commercial 3G and 4G phones aided to the growth in e-commerce industry. Demand for businesses offering online products and services went up with internet becoming more accessible in tier 2 and tier 3 cities. Sensing the changing needs of the country, online food delivery and cab hailing businesses commenced operations.

Evolution of e-commerce in India:

Source: CRISIL MI&A Research

Advancement in technology shaping the e-commerce industry

The e-commerce industry is reliant on technology in playing a crucial role in areas such as value chain, recruitment, marketing, advertising, warehouse management, and product delivery, among other things • E-commerce companies are no longer competing solely on the grounds of their product offerings and geographical presence. E-commerce competition now has expanded to areas which include providing digital experience to the customers using analytics, virtual reality, robotics, and other advanced technologies. Companies are integrating deep analytics in sales and marketing software to enable dual-way communication between e-commerce brands and their customers. Indian E-commerce giants like Amazon, and Flipkart, have implemented artificial intelligence (AI) and machine learning (ML) technology in personalized targeting, customer care services, and marketing activities. E-commerce companies have also adopted faster, efficient and secure payment options like Apple Pay, Google Pay, and Amazon Pay to target India's unbanked population.

From the user's perspective, India is witnessing rapidly rising number of smartphone user base and so as there is spike in internet penetration. Rising number of internet users make the tech-advanced platforms more accessible to the masses. CRISIL MI&A Research expects internet penetration in the country will reach ~75% by fiscal 2026 giving boost to overall e-commerce market.

Note: Retail and e-retail industry is covered in detail under module 5.1, 5.3, and 5.4 of the report.

12 Overview of assisted e-commerce industry in India

Assisted e-commerce enables online shopping for masses

While certain parts of India rely almost entirely on the e-commerce world for even the smallest of things, from buying shampoo to buying mobile phones, electronics, furniture, and other products not worth rupees, there remains population that is not yet exposed to this part of the internet space.

A major reason for such ignorance is a lack of awareness and coping with the usefulness of such services. There are other causes that hinder the use of e-commerce in rural areas, such as the unavailability of good internet connections, smart devices, lack of robust distribution channel etc. This ignorance completely undermines the process of how these online purchases work.

The vast range of information and communication technology tools offers room to improve service processes, and to open new avenues for village-level entrepreneurship and local wealth creation. Assisted e-commerce is one such avenue which rests on ICT application to build a win-win solution for village-level entrepreneurs and for people residing in rural regions looking up-to someone in their local neighbourhood who can assist them in a buying decision. It's a simple process that requires little initial investment for shop owners in rural areas and can really give the world of e-commerce a boost.

In assisted e-commerce set-up, an employee/entrepreneur assists the local population in browsing and ordering an item of their choice, within their budget, online, through open-web websites or designated websites, gets the delivery at their store and delivers it to the consumer against cash or any other form of payment methods.

Enabling people in rural and semi-urban areas to take full advantage of the perks, offers and discounts e-commerce offers to ensure complete customer satisfaction can be made a simple task using this business model. As a result, the people in rural India can be made to trust the world of the online market space for their financial transactions. Assisted e-commerce got the potential to boost people's trust and slowly lead India towards the much-needed digitalisation.

Assisted e-commerce provides solution to the following key issues related to online shopping in rural regions:

- Doorstep delivery in the rural regions
- Lack of knowledge to access online shopping websites
- Trust deficit on online shopping platforms due to various reasons

Key players and tie-ups in the assisted e-commerce space

Company	Launch of project or tie-up	Description
BLS International Services Limited	2021 (Deal with Amazon)	BLS International is global tech-enabled services partner for governments and citizens. In India, the company is also in the business of last mile services for assisted buying and delivery across the country. In 2021, the company undertook assisted e-commerce services for Amazon as part of a three-year mutually exclusive agreement to provide last-minute connectivity through its centres across India. BLS centre operators will

		book the product for the consumer from the range available on Amazon.in and the customer can pay for the product in cash. BLS centre operator, in turn, will make the payment online on the portal and the consumer can then pick up the product from the centre once it is delivered.
Vakrangee Limited	2014-2019	Vakrangee Limited is a technology company that provides banking, insurance, e-governance, e-commerce, and logistics services. The company started sale of products through assisted e-commerce channel during 2014-2019 period. The company has tie-up with Amazon and Decathlon to provide assisted online shopping services. The company also offers assisted Telemedicine service, online shopping of medicines, mobile/DTH recharge, bill payments, train, bus, and flight ticketing assistance, and online agriculture product and services
Frontier Markets Consulting Pvt Ltd	2018 and 2020	Frontier Markets is a social commerce platform with a mission to create 'Saral Jeevan' or an 'Easy Life' for rural households by providing them local access to high quality, climate friendly, and gender inclusive products and services. Frontier Markets launched Meri Saheli mobile app, India's first assisted e-commerce app designed by and for rural women. In 2020, they launched AI enabled assisted e-commerce, and B2C digital marketing.
TABLT Pharmacy	2018	TABLT Pharmacy has an omnichannel presence across 500 towns in West Bengal, Bihar, Jharkhand, and Odisha and claims to supply over the counter medicines and products in remote locations within a day. In assisted e-commerce model, partners help and place orders on behalf of customers through a portal. Partners are usually local second-generation businessmen in the area with their own shops or a standalone TABLT franchise. They collect money from customers and get a commission based on the number of orders they help place. The company also offers a 24/7, 365-day teleservice for consumers to call and place an order in regional languages of these states.
Amazon Easy Store (Earlier Amazon Udaan project)	2015	Amazon Easy is a program that enables e-commerce businesses to provide online shopping assistance to their

		customers. The goal of this initiative is to help customers start their journey into e-commerce. With the branding of Amazon Easy, store owners increase the customer base in their stores. With Amazon Easy Store customers can get product delivery at their doorstep.
Flipkart and Spice Hotspot partnership	2015	Flipkart tied up with smartphone retailer Spice Hotspot to showcase its exclusive phone portfolio in retail stores across India. As part of this assisted e-commerce model, customers can experience Flipkart's exclusive range of smartphones at selected Spice Hotspot outlets. The store staff will assist them to place their order on the Flipkart app and customers can take the delivery of the phones at the same store or at their home
Sterlite Technologies Ltd:	2018	STL Garv was launched with the vision to enhance the usability and impact of broadband highways. It ensures critical services like assisted e-commerce, e-health, e-education, and e-governance are accessible to rural citizens and marginalised populations. The product is a supercomputer as a kiosk that empowers admittance to numerous coordinated digital services and infrastructure in rural communities
IPay Tech India Private Limited	2013	Ipay operates e-commerce kiosks under the Dekanline brand. IPay serves as a single point technology platform wherein a consumer can place an order at IPay kiosks placed at local grocery stores. It also offers call centre facility to place orders which are later delivered at the grocery store or to the customer directly
Reliance Retail started assisted e-commerce for Ajio through Jio stores	2019	Reliance Retail started a pilot of assisted e-commerce in its smaller Jio Stores whereby its staff can place consumer orders from Ajio.com through a kiosk inside the store and consumers will be able to collect or return orders from there itself. This was part of Reliance's strategy to connect first time online consumers with its e-commerce platform
Janus platform by Sanpdeal	2015	Ecommerce player Snapdeal introduced Janus, a multi-channel platform where users can discover, buy, same day local delivery and get value added services such as demos, installation, activation and returns at a store near them. The platform aimed to integrate offline and online retail channels.

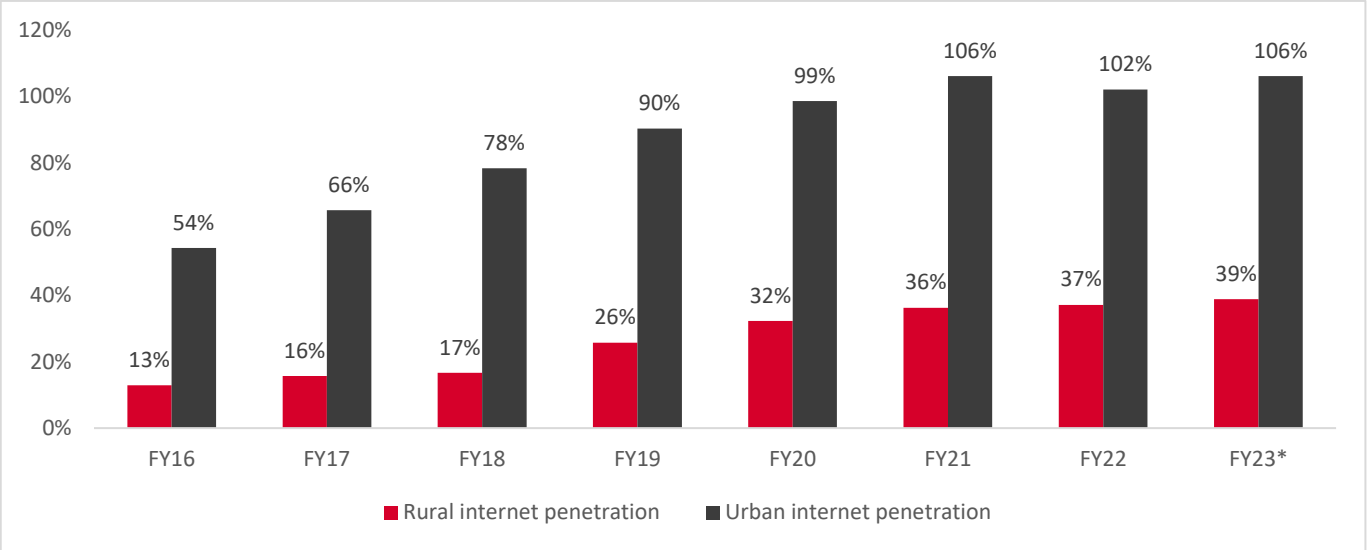
Source: Company website, CRISIL MI&A Research

Growth drivers for assisted e-commerce

Internet penetration remains underpenetrated in the rural regions coupled with lower literacy rates

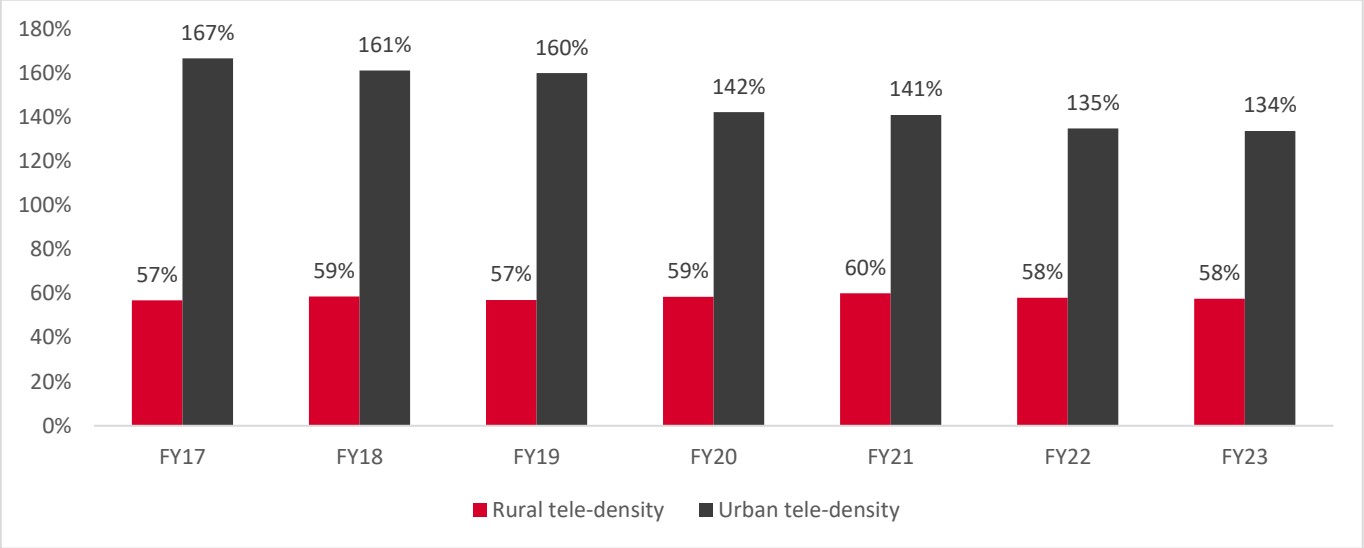
According to census 2011, 68.8% of the population i.e., ~833 million people, resides in the rural regions of India. With economic development happening all over the country, businesses in India are optimistic about growth of the country's rural consumer markets, which is expected to be growing faster than urban consumer markets. Smart companies are quickly moving to uncaptured rural areas, which are at a nascent stage and provide robust market potential. The wider reach of media and telecommunication services provide information to rural consumers and influence their purchase decisions. Even after continuous ongoing efforts from the telecom operators, the internet penetration and tele-density in rural regions remain underpenetrated. Sub-standard telecom infrastructure, lack of awareness, and lower literacy rate are a few of the key reasons behind lower penetration.

Internet penetration rate in India



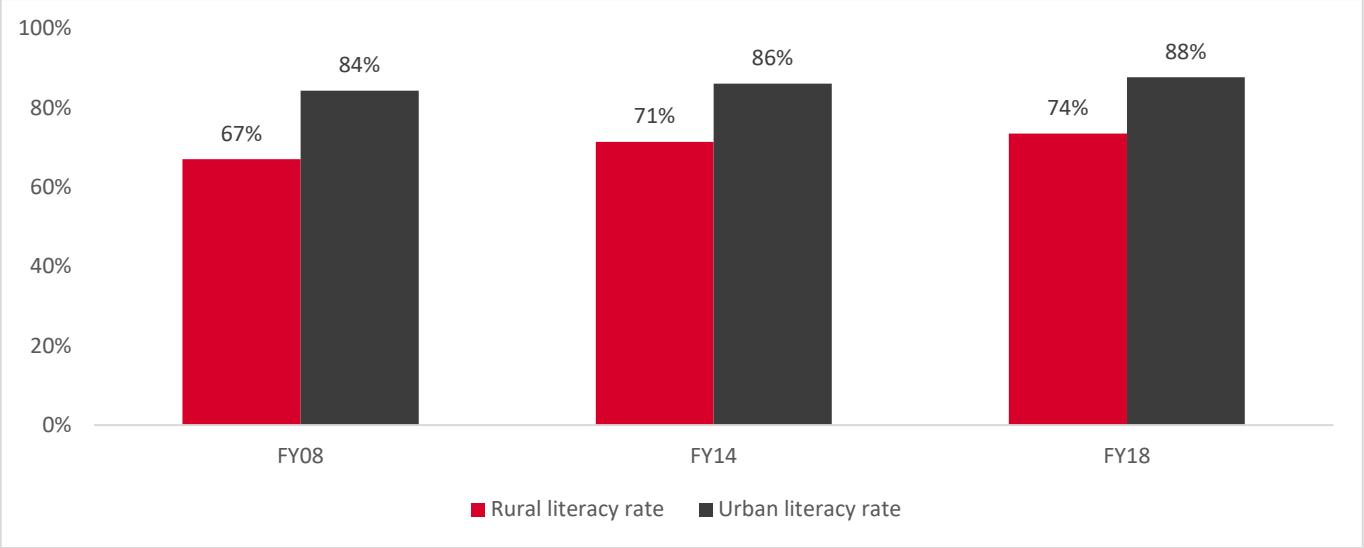
*Note: *FY23 data is till December 2022*
Source: Telecom Regulatory Authority of India (TRAI), CRISIL MI&A Research

Tele-density in India



Source: Telecom Regulatory Authority of India (TRAI), CRISIL MI&A Research

Literacy rate in India



Note: Literacy rate among persons of age 7 years and above

Source: NSS 75th round survey, CRISIL MI&A Research

Cost of fixed and wireless internet is one of the lowest in India

Despite fixed and wireless costs as % of GNI is on the higher side for India, in absolute terms, the data plans are cheaper compared to other countries. This is likely to aid players operating in the segment to deepen penetration in assisted e-commerce space.

Country	Fixed broadband price (USD)	Wireless broadband price (USD)
USA	54.4	7.8
United Kingdom	46.1	14.0
Japan	36.2	41.7
China	4.7	4.7
South Africa	23.3	11.3
Indonesia	24.1	2.7
India	5.3	1.8

Source: International Telecommunication Union, CRISIL MI&A Research

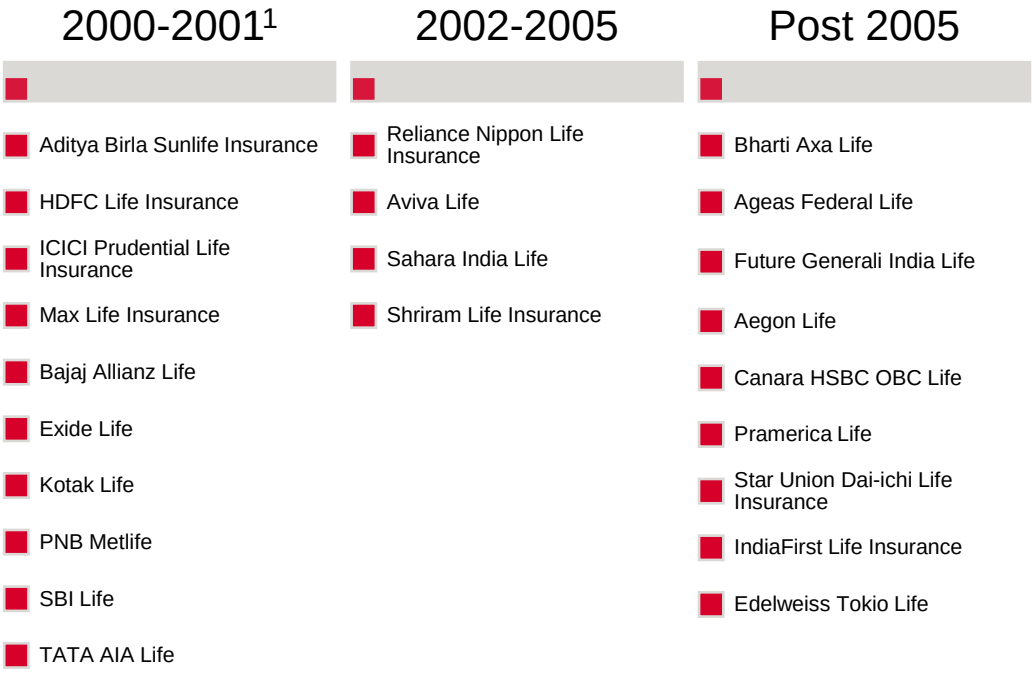
13 Assessment of insurance industry in India

13.1 Overview of Indian life insurance industry

As of June 2022, there are 23 private sector life insurance companies and one public sector life insurance company, i.e., LIC. The Indian life insurance industry only had LIC from 1956 to 2000.

Since privatisation in 2000 and by fiscal 2012, 23 private insurers had entered the space, registering with the Insurance Regulatory and Development Authority of India (IRDAI) as on March 31, 2022. Of these, 20 have joint ventures (JVs) with foreign partners.

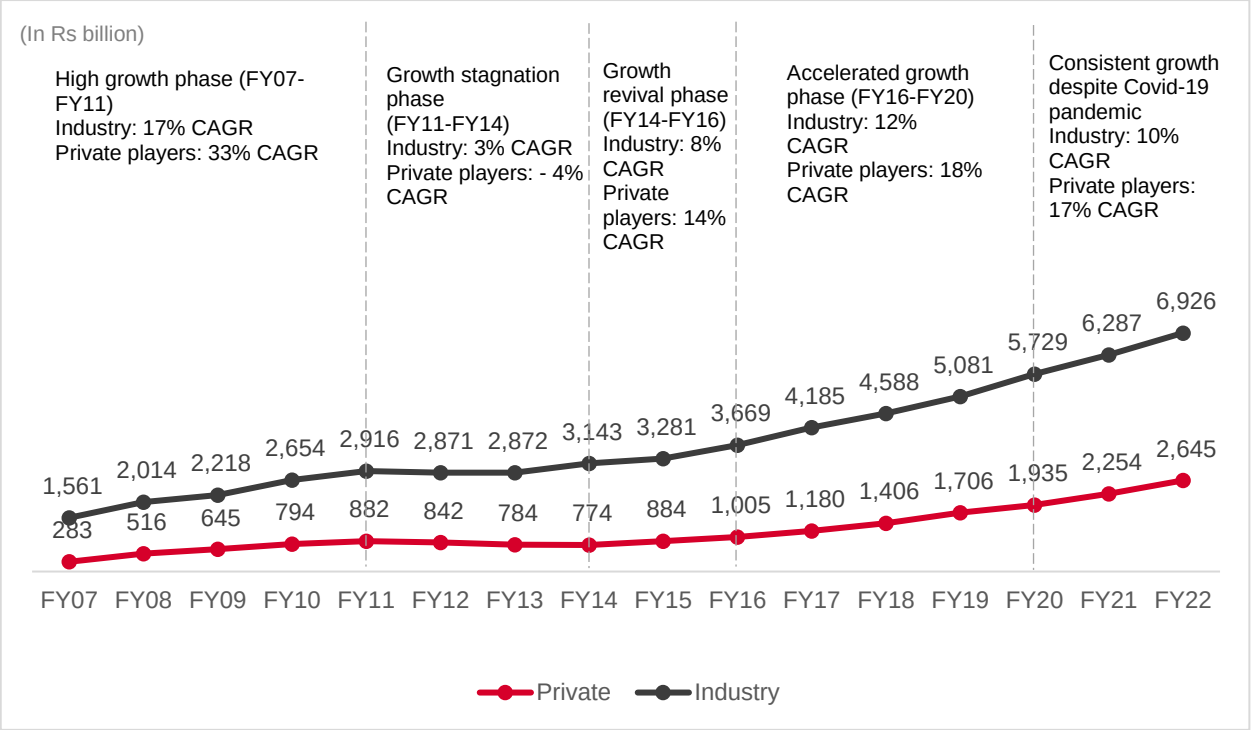
Timeline of private players' entry into life insurance industry



Note: Denotes Calendar Year
Source: IRDAI Handbook, CRISIL MI&A

The industry has not witnessed any new entrants since fiscal 2013 and there has been only one major merger and acquisition in the industry by the way of acquisition. Exide Life Insurance was acquired by HDFC Life in fiscal 2022.

Trend in total premium generated for private players as well as industry



Source: IRDAI Handbook, CRISIL MI&A Research

Robust growth of life insurance industry from fiscals 2007 to 2011

Total premium for the industry rose a sharp 17% CAGR between fiscals 2007 and 2011, owing to aggressive foray by private players. The total premium for private players grew at a stupendous ~33% CAGR during the same period, driven by ULIP sales amid a buoyant capital market. Therefore, total premium on linked products grew at 18% CAGR during the period.

Hence, the share of private players in total premium increased from 18% in fiscal 2007 to 30% in fiscal 2011. The share of bancassurance channel in the individual NBP increased from 6% to 13% over the period, as private players looked at banking channels to market their products and increase reach. As of fiscal 2011, private players comprised 64% market share in the linked products segment.

Industry underwent a transition from fiscals 2011 to 2014

After the sharp growth during fiscal 2007 to 2011, the industry saw a sudden slowdown over the subsequent three years. Regulatory changes by the IRDAI with respect to linked products, decline in financial savings rate and weak performance of the equity markets led to the deceleration.

The IRDAI's regulation capping product charges resulted in a decline in the commission of linked products, thereby making sales of these products less lucrative for intermediaries. The move affected the growth of private players because of their high exposure to linked products; linked products constituted 71% share of private players' portfolio mix in fiscal 2011. Between fiscals 2011 and 2014, total premium of private players declined at 4% CAGR.

Meanwhile, private players relooked at their product offerings, distribution channel mix, and operational efficiency. The focus on traditional products increased, as reflected in the share of linked products in the product mix declining

from 71% in fiscal 2011 to 45% in fiscal 2014. Sales via the banking channel was enhanced and the industry went slow on branch rollouts as against the significant branch expansion before 2010; these moves reduced upfront infrastructure cost and selling expense. Additionally, the focus on technology increased. All these moves resulted in the industry's return on equity (RoE) rising from -3% in fiscal 2011 to 17% in fiscal 2014.

Revival between fiscals 2014 and 2016

After the slowdown between fiscals 2011 and 2014, the total premium of private players grew at 14% CAGR during fiscals 2014 to 2016, outpacing the industry growth of 8% CAGR. In this period, the growth of private players can be attributed to adoption of technology by insurers and the industry adapting to the revised product regulations and the environment. Growth was also because of macro factors such as expectations of improvement in economic growth and cooling inflation.

Accelerated growth between fiscals 2016 and 2020

Industry total premium continued to grow between fiscal 2016 and 2020 at a strong rate of 12% CAGR. Private players grew at a higher rate of 18% CAGR as compared to industry. Emerging distribution channels such as web aggregators, IMFs, etc. were introduced during this phase. Growth was also witnessed due to increase in financial savings, share of life insurance in household financial savings and healthy returns provided by equity and debt markets during this period.

Consistent growth in pandemic

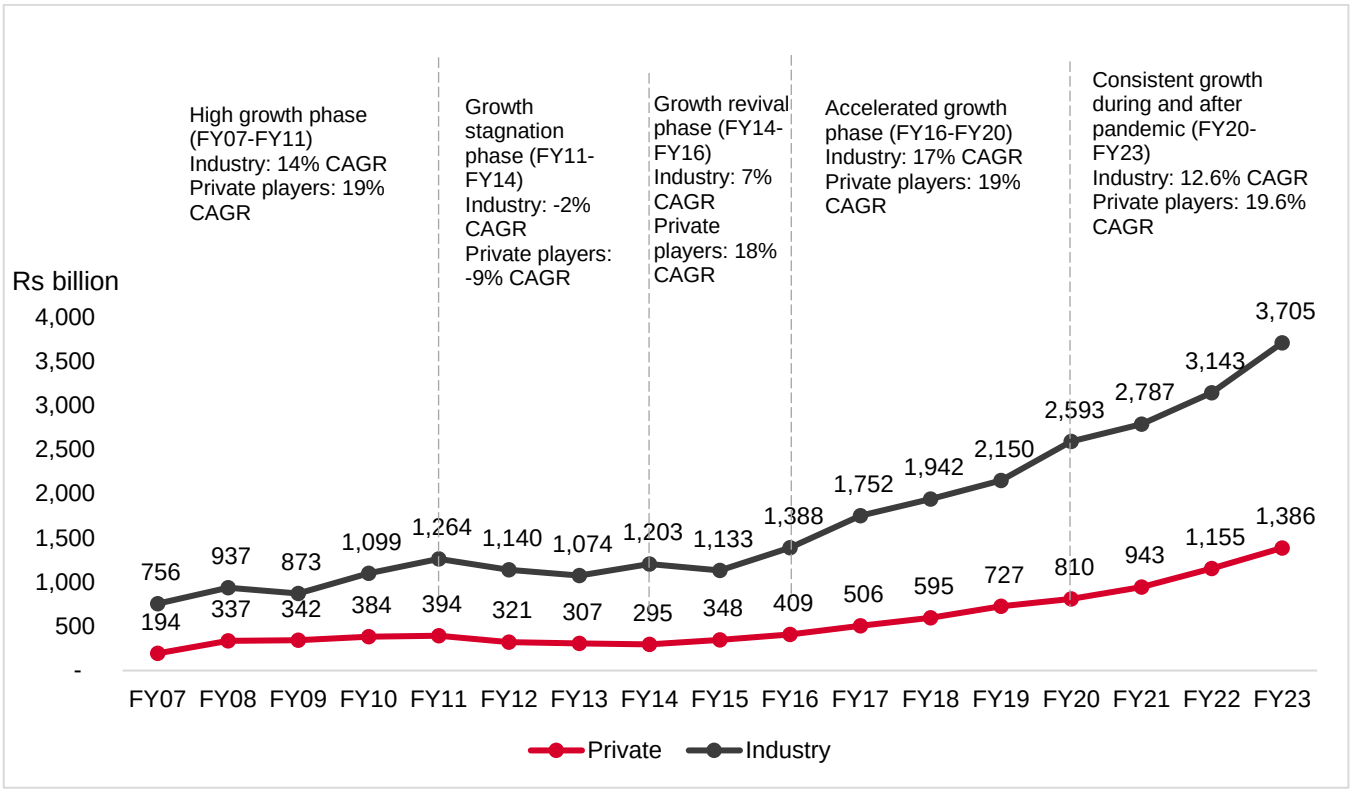
While the industry witnessed sequential growth decline in new business premium during Q4 of fiscal 2020, Q1 of fiscal 2021 and Q1 of fiscal 2022 due to Covid-19, the year-on-year growth in total premium remained unaffected in fiscal 2021 and 2022. Industry grew at 9.7% and 10.2% year-on-year in fiscal 2021 and 2022 respectively. The strong recovery in fiscal 2022 indicates a strong perceptible shift in the attitude and awareness towards life insurance. The financial impact of the pandemic also led to people valuing the protection and fallback offered by life insurance products in tough times. The total premium growth from non-linked products in fiscal 2021 and 2022 was 9.8% and 10.1% respectively year-on-year basis whereas the same for private players was significantly higher at 22.1% and 22.3% in fiscal 2021 and 2022 respectively. Further, the life insurance industry, which mainly depended on in-person interaction, has adopted more digital ways of selling products and services in the past one year amid the pandemic.

Similar trend visible for NBP

Similar to the trend in the total premium, the new business premium also witnessed stupendous growth of 14% CAGR and 19% CAGR for industry and private players respectively during fiscal 2007 to 2011. Further, the growth stagnated during fiscal 2011 to fiscal 2014, followed by a period of high growth until fiscal 2020. The private players recorded 18% CAGR growth in new business premium during fiscal 2014 to fiscal 2020, as compared to 14% growth for industry.

During fiscals 2014 to 2020, NBP of industry and private players posted CAGRs of ~14% and ~18% respectively. In fiscal 2023, the industry recorded NBP of INR 3,705 billion with a year-on-year growth of 18%, whereas the private players recorded a strong 11% year-on-year growth with NBP of INR 1,386 billion.

Trend in NBP for Private players and industry

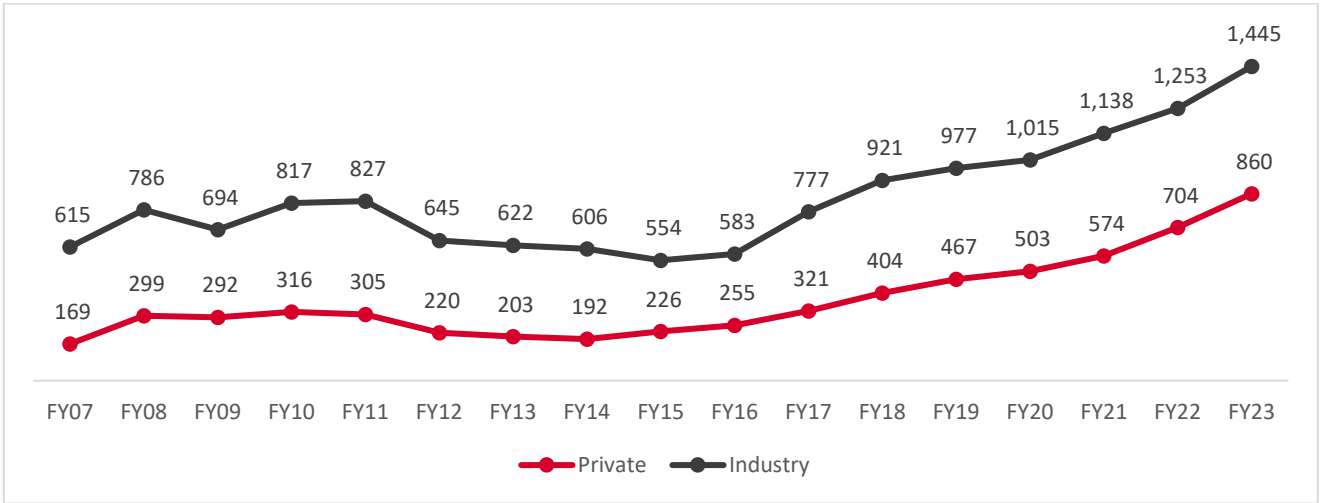


Source: IRDAI Handbook, CRISIL MI&A Research

Even on individual NBP basis, the private players recorded strong growth of 17.4% CAGR during fiscal 2014 to 2020; further, this was in sharp contrast to the 14.3% CAGR decline on individual NBP basis during fiscal 2011 to 2014. The growth rate continued to be strong during fiscal 2020 and 2023 with a CAGR of 19.6% on individual NBP basis despite Covid-19 pandemic. The private players and industry in terms of individual new business premium grew at a 5-year CAGR ending fiscal 2023 16.3% and 9.4% respectively.

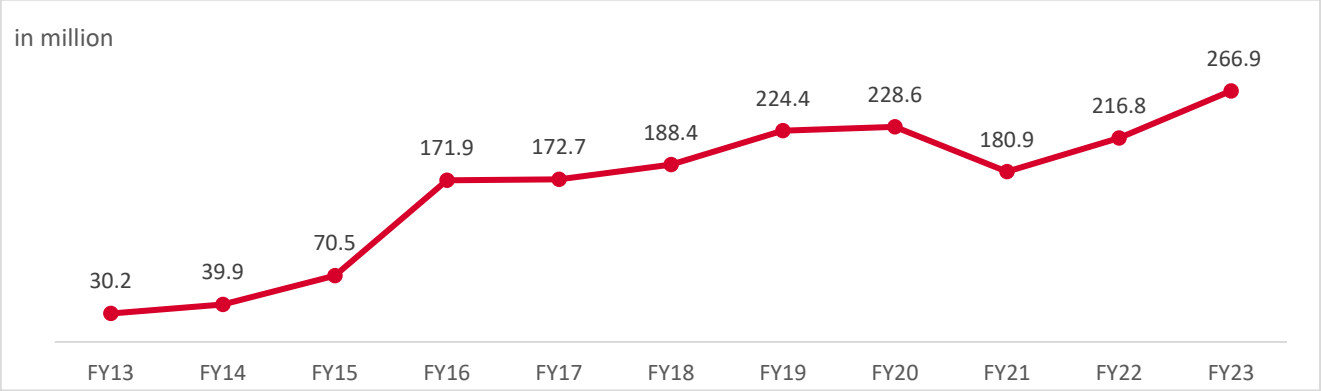
Number of lives covered grew at a much higher rate during fiscal 2013 to fiscal 2018 at a CAGR of 44% as compared to the next five years ending in fiscal 2023 where it grew at a CAGR of 7%.

Trend in individual new business premium for private players and industry



Source: IRDAI Handbook, CRISIL MI&A Research

Trend in number of lives covered



Source: IRDAI Handbook, CRISIL MI&A Research

Bancassurance channel to continue to post robust growth

The life insurance industry, especially the private players, have significantly leveraged banking channels to foster growth along with other distribution channels. This gradually has led to an increase in share of bancassurance channel and a decline in the share of individual agents in distribution of individual life insurance products. Share of bancassurance channel for the industry rose from ~15% of NBP in fiscal 2012 to ~32% in fiscal 2022, in the individual NBP, driven majorly by private life insurance players with banks as promoters and players who have empanelled large private or public sector banks with strong branch network as their corporate agents. For private players, the share of bancassurance channel was much higher (compared to overall industry) at ~55% in fiscal 2022 on individual NBP basis

Trend in channel-wise share of individual new business premium of overall life industry

Channel-wise new business share	FY12	FY17	FY22
Individual agents	78.7%	68.8%	55.0%
Corporate agents – Banks	15.0%	23.5%	32.0%
Corporate Agents – Others	2.7%	1.3%	1.9%
Brokers	1.8%	1.3%	1.9%
Direct business	1.9%	5.0%	8.5%
Total	**100.0%**	**100.0%**	**100.0%**

Source: Public disclosures of LI players, CRISIL MI&A Research

Note: Total excluding Referrals. Individual new business premium in fiscal 2012, 2017 and 2022 was INR 647 billion., INR 777 billion and INR 1,252 billion respectively

Trend in channel-wise share of individual new business premium for private players

Channel-wise new business share	FY12	FY17	FY22
Individual agents	44.5%	30.1%	22.9%
Corporate agents - Banks	39.0%	53.5%	54.9%
Corporate Agents - Others	7.5%	3.1%	3.4%
Brokers	5.1%	3.0%	3.3%
Direct business	4.3%	10.0%	14.9%
Total	**100.0%**	**100.0%**	**100.0%**

Note: Total excluding Referrals. Individual new business premium in fiscal 2012, 2017 and 2022 was INR 220 billion, INR 320 billion and INR 703 billion respectively.

Source: Public disclosures of LI players, CRISIL MI&A Research

The share of individual agents, despite declining from ~79% in fiscal 2012 to ~55% in fiscal 2022, is still high for the industry as a whole, majorly attributed to high share of agency channel in channel mix of LIC (~96% in fiscal 2022 on individual NBP basis).

Indian life insurers leveraged the strong branch presence of their bancassurance partners to drive growth. The premium generated from bancassurance network (Corporate Agents- Banks) for the industry grew at a strong CAGR of ~15% from ~INR 97 billion to ~INR 400 billion from fiscal 2012 to 2022. Further, for private players as well, the NBP generated through the banca channel increased at ~16% during fiscal 2012 to fiscal 2022.

13.2 Overview of Indian general insurance industry

As of March 2022, there are 20 private sector, 6 public sector general insurance companies and 5 private sector health insurers also known as Stand-alone Health Insurers (SAHI). The Indian general insurance industry only had 4 public sector general insurers until fiscal 2000 namely National Insurance Co. Ltd., The New India Assurance Co. Ltd., The Oriental Insurance Co. Ltd. and United India Insurance Co. Ltd. Apart from the 4 public sector general insurers, there are two Specialized Insurers, namely ECGC (Export Credit Guarantee Corporation of India) and AIC (Agriculture Insurance Corporation) and one in reinsurance namely GIC Re which are also in public sector.

Timeline of private players' entry into general insurance industry

2000-2005	2005-2010	Post 2010
IFFCO Tokio General Insurance Co. Ltd.	Star Health & Allied Insurance Co. Ltd.	HDFC ERGO General Insurance Co. Ltd.*
Reliance General Insurance Co. Ltd.	Future Generali India Insurance Co. Ltd.	Liberty General Insurance Ltd.
Royal Sundaram General Insurance Co. Ltd.	Universal Sompo General Insurance Co. Ltd.	Magma HDI General Insurance Co. Ltd.
TATA AIG General Insurance Co. Ltd.	Raheja QBE General Insurance Co. Ltd.	Care Health Insurance Ltd.$
Bajaj Allianz General Insurance Co. Ltd.	Shriram General Insurance Co. Ltd.	ManipalCigna Health Insurance Co. Ltd.
ICICI Lombard General Insurance Co. Ltd.^	SBI General Insurance Co. Ltd.	Kotak Mahindra General Insurance Co. Ltd.
Cholamandalam MS General Insurance Co. Ltd.	Niva Bupa Health Insurance Co. Ltd.#	Aditya Birla Health Insurance Co. Ltd.
		Acko General Insurance Ltd.
		Edelweiss General Insurance Co. Ltd.
		Go Digit General Insurance Ltd.
		NAVI General Insurance Ltd.
		Reliance Health Insurance Ltd.@

Source: IRDAI Handbook, CRISIL MI&A Research

Note: The insurers highlighted are Stand-alone Health Insurers (SAHI)

** Erstwhile HDFC Ergo Health Insurance Co. Ltd. merged with HDFC Ergo General Insurance Co. Ltd. w.e.f. 01.03.2020.*

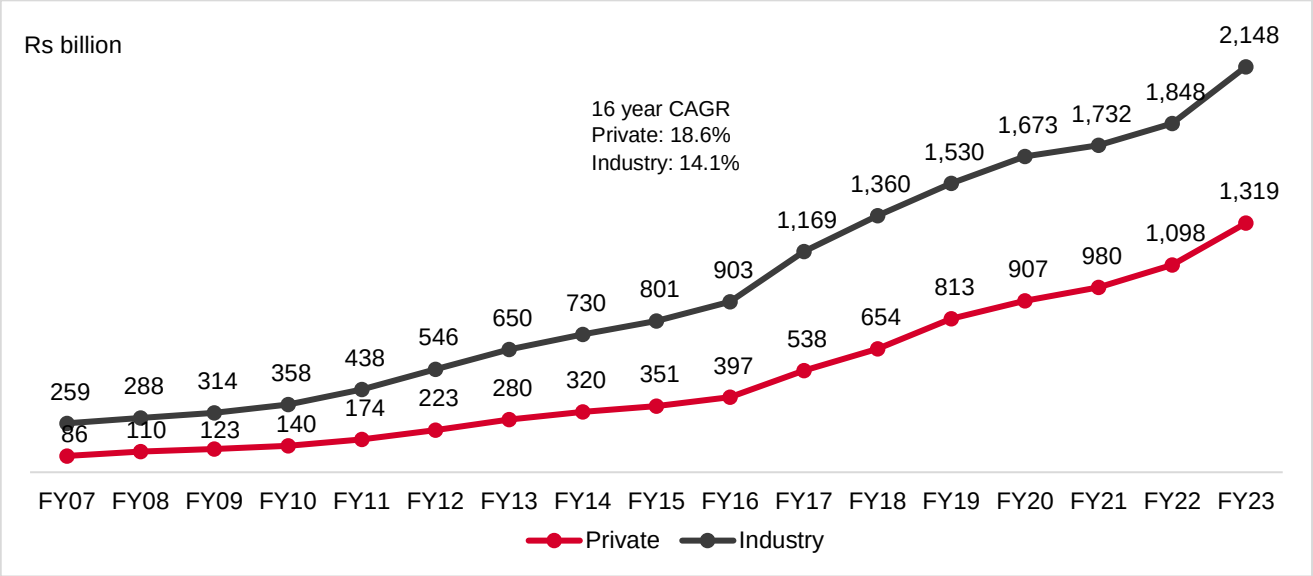
$ Religare Health Insurance Co. Ltd. is renamed as Care Health Insurance Ltd.

 # Max Bupa Health Insurance Co. Ltd. is renamed as Niva Bupa Health Insurance Co. Ltd.

@Takeover of Reliance Health Insurance portfolio by Reliance General Insurance

^Demerger of general Insurance business of Bharti AXA General Insurance Co. Ltd. to ICICI Lombard General Insurance Co. Ltd. w.e.f. April 01, 2021.

Trend in gross direct premium generated for private general insurers and industry (excluding stand-alone health insurers and specialized insurers)



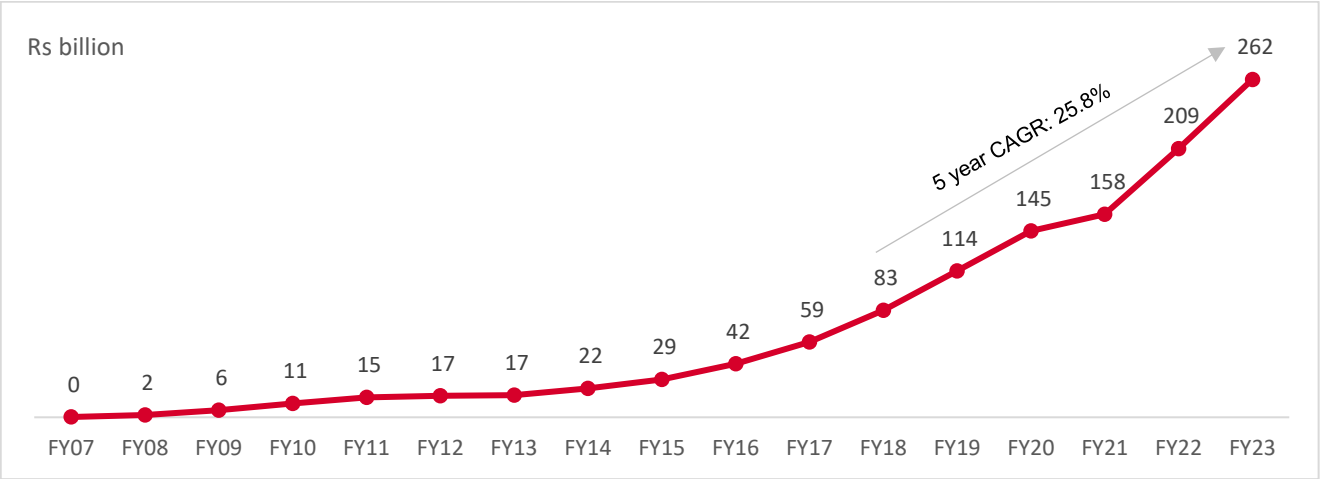
Source: IRDAI Handbook, CRISIL MI&A Research

Indian general insurance industry has witnessed a continuous growth over the past 16 years. The industry (excluding stand-alone health insurers and specialized insurers) has grown at a CAGR of 14.1% between fiscals 2007 and 2023. However, private players have grown at a much higher pace as compared to overall industry. The private players grew at a robust CAGR of 18.6% during the same period. This growth can be majorly attributed to the increasing number of corporate agent and broker tie-ups and subsequent increase in share of premium through intermediary channels, regulatory intervention to promote insurance penetration, technology enabled business transformation and emergence of digital channels of distribution.

The private sector health insurers also known as stand-alone health insurers (SAHI) collected a premium of INR 262 billion in fiscal 2023 with a year-on-year growth of 25.4%,. SAHIs started their operations in fiscal 2007 and have been growing continuously since then. Premium from these 5 players grew at a CAGR of 25.8% between fiscals 2018 and 2023. Their growth can be majorly attributed to the increasing awareness about health insurance and mediclaim amongst young population, especially post the COVID-19 pandemic, customer centric products and propositions, increasing number of insurer tie-ups for cashless claims and increase in customer touch points.

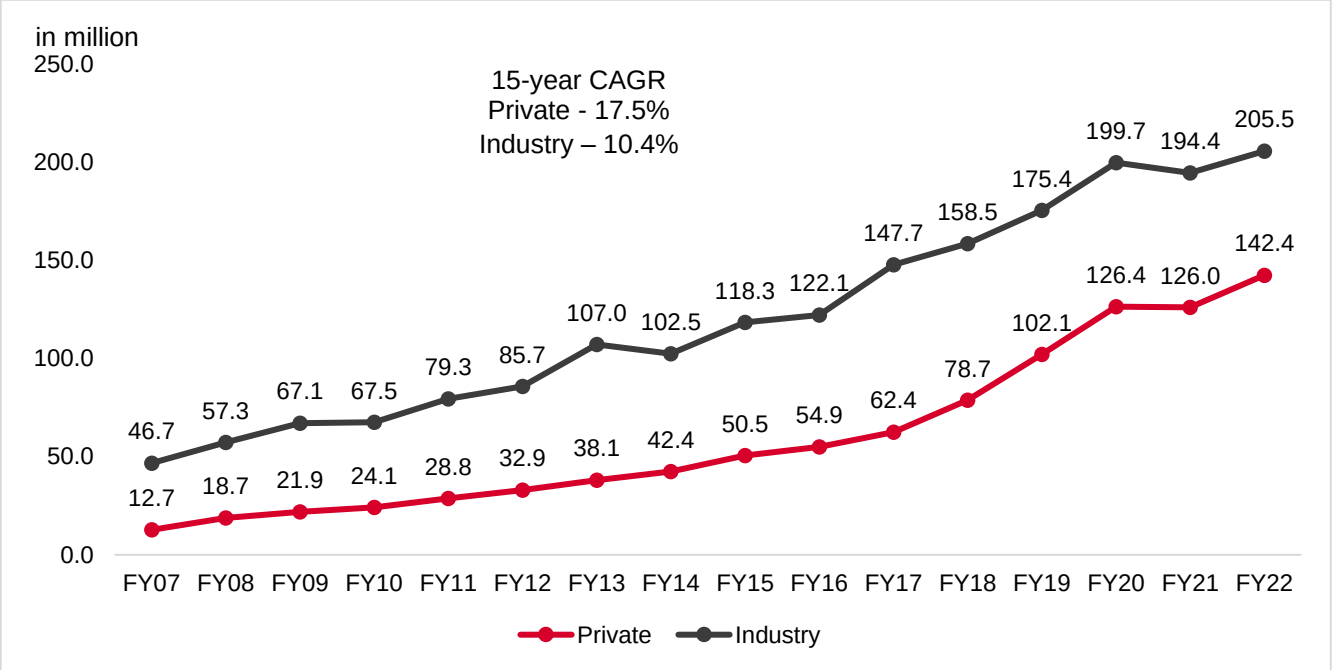
The growth in the healthcare industry is supported by increased demand due to the COVID-19 pandemic and government initiatives like access-free drugs and diagnostics under the Ayushman Bharat programme, increased spending under healthcare, and increased penetration of insurance and increased awareness about regular health check-ups.

Trend in gross direct premium generated for stand-alone health insurers (SAHI)



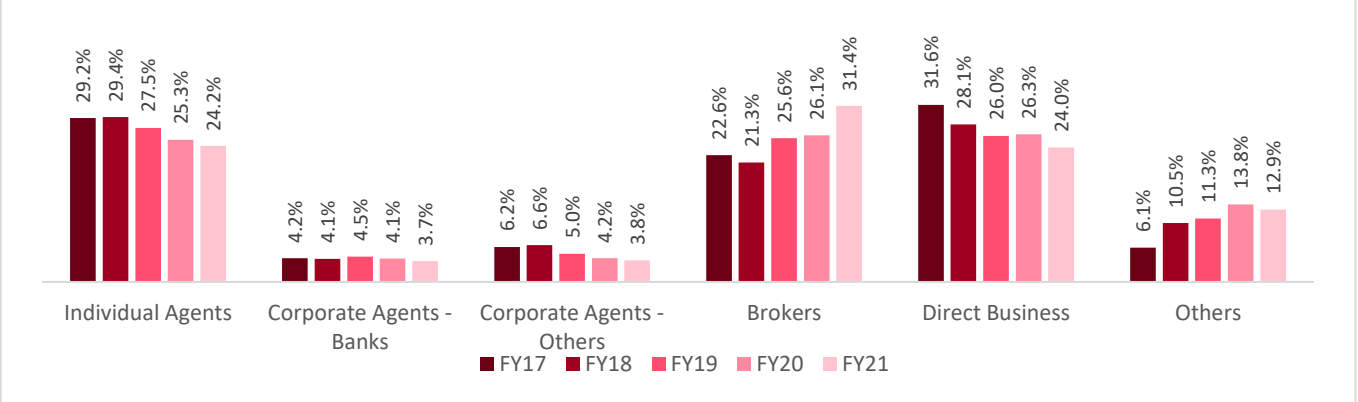
Source: IRDAI Handbook, CRISIL MI&A Research

Trend in number of policies generated for private and public sector general insurers



Source: IRDAI Handbook, CRISIL MI&A Research

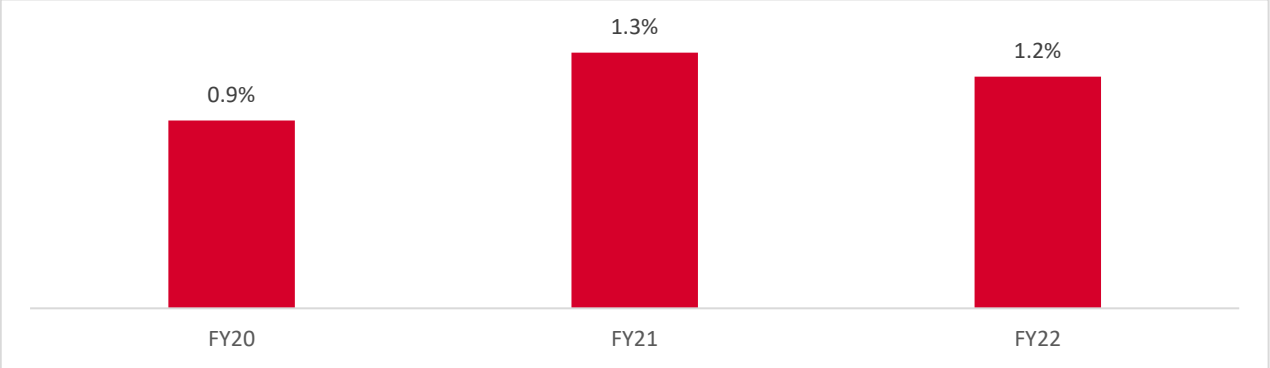
Trend in channel-wise business performance for general insurers (excluding SAHI and specialized insurers)



Source: IRDAI Handbook, CRISIL MI&A Research

Insurers are moving their focus towards direct line of business to have reduced intermediary costs, better control on the product mix and ease of driving business due to which premium through direct line is increasing, however, due to increasing number of intermediaries getting tied up with insurers, the share of business from broker channel is increasing continuously since fiscal 2019. Share of broker channel increased from 22.6% in fiscal 2017 to 31.4% in fiscal 2021 making it the channel with maximum share of premium of general insurers. Further, online business has witnessed an increase in share of business despite share of overall direct channel decreasing. Online share increased from 0.9% in fiscal 2020 to 1.2% in fiscal 2022.

Trend in online premium as per cent of premium for private and public sector general insurers (excluding SAHI)



Source: IRDAI Annual Report, CRISIL MI&A Research

13.3- Growth drivers for Indian insurance industry

Key regulatory changes

Passage of the Insurance Law (Amendment) Act, 2015

The government made certain key changes in the insurance industry through the passage of the Insurance Law (Amendment) Act, 2015, in March 2015. The Act aims to open up the sector further for foreign investments while ensuring that control of management still remained in the hands of the Indian partners. The Act also tried to bring clarity to certain regulatory aspects of the insurance sector.

Stricter action if norms and regulations are violated

The Act imposed stricter penalties on life insurance companies for failing to meet the required rules as mandated by the IRDAI. Some of the violations, which attracted stricter penalties were:

- Failure to maintain required solvency margin
- Non-disclosure of mandatory data with IRDAI
- Payment of commission to unlicensed insurance agents
- Any false statement in documents furnished by the company
- Failure to comply with the provisions of the Insurance Act or rules and regulations

Omission of redundant clauses and amendment of some others

The Act also amended and omitted certain clauses such as

- Omission of clause which required Indian promoters to reduce their stake to 26% within 10 years of inception
- The amendment allowed the facility to provide loans to the company's full-time employees
- The record can now be maintained only electronically without any need for maintenance of "register or record"
- The Act introduced 'beneficiary nominees' and 'collector nominees'; previously, the nominee was only a recipient of claims and not the beneficiary

Limitation of tie-ups for individual agents

The agent cannot do business with more than one life insurer, one general insurer, one health insurer, and one of each of the other mono-line insurers.

Repudiation on insurance policy only for a period of three years

No policy can be repudiated on any ground, including mis-statement of facts after three years, post the commencement of the policy by the company.

Guidelines for corporate governance

To facilitate prudent corporate governance amongst insurance companies, IRDAI put in place some guidelines in May 2016. The guidelines encompass structure and composition of the boards of insurance companies, committees of the board, their responsibilities and meetings, appointment of MD/CEO, directors and key management persons (KMPs), appointment of auditors, reporting and disclosure requirements.

Investment by Private Equity firms in unlisted Life Insurance companies

In-order to streamline regulations pertaining to private equity investments, the IRDAI introduced new regulation (Investment by Private Equity funds in Indian Insurance Companies) in December 2017. The regulation laid down the following rules for private equity investment:

- Private equity fund can directly invest in an unlisted Life insurance company (only in the capacity of investor and not promoter) if the holding does not exceed 10% of the paid-up equity share capital of life insurance company
- Private equity fund can also invest in an unlisted life insurance company in capacity of a promoter through a Special Purpose Vehicle (SPV)
    - Issuance of fresh equity beyond 25% in the SPV will require prior approval of the IRDAI
    - The investment through SPV will be subjected to lock-in period of five years. The lock in period shall be applicable on SPV and also on the shareholders of the SPV. Provided that the above said lock in period shall not be applicable on the shareholders of SPV holding less than 10% capital of SPV

FDI Cap increased from 49% to 74%

The Parliament, in March 2021, passed the Insurance Amendment Bill 2021 to increase the foreign direct investment (FDI) limit in the insurance sector to 74% from 49% of paid-up equity capital previously. Higher FDI limits will also enable more global insurance firms and their best practices entering India thus increasing competition and better pricing of insurance products.

Guidelines on Insurance e-commerce

The IRDAI as part of its developmental mandate, issued insurance e-commerce guidelines to promote e-commerce in insurance space which is expected to lower the cost of transacting insurance business and bring higher efficiencies and greater reach. For the purposes of these guidelines an insurance agent is not permitted to set up a separate insurance self-network platform and instead can use respective insurer's self-network platform, if available. However, the insurer shall be responsible for compliance of these guidelines on behalf of the insurance agents.

Stewardship Code for Insurers in India

The code is in the form of a set of principles which the insurance companies need to adopt and were made applicable from fiscal 2018. As per the code, insurer should have a board approved stewardship policy which should identify and define the stewardship responsibilities that the insurer wishes to undertake and how the policy intends to fulfil the responsibilities to enhance the wealth of its policyholders who are ultimate beneficiaries. However, a revised guidance on stewardship code was prepared and placed herewith as Revised Guidelines on Stewardship Code for Insurers in India in February 2020.

Public Disclosures by Insurers

The IRDAI had issued circular "Public Disclosure by Insurers" on 26th May 2011 and guidelines on "Periodic Disclosures" were also issued on 9th April 2010. However, the revised instructions on Public Disclosure by Insurers which will supersede the provisions of the earlier circular were issued in September 2021.

The revised instructions shall come into effect from the financial year 2021-22 and the uploading of disclosures on website shall be on quarterly basis from the period ending 30th September 2021 whereas publishing in Newspapers will be on half yearly basis from the period ending 30th September, 2021.

Exposure draft notification on Expenses of Management

In August 2022, the IRDAI introduced an exposure draft notification on Expenses of Management of Insurers transacting life insurance business. The notification detailed guidelines on the upper limits for the various Expenses of Management of Insurers transacting life insurance as also the formulation of policies governing the same.

Key regulatory changes pertaining to customers

Unit Linked Insurance Products Regulations, 2019

The regulations stated that unit Linked insurance products shall be offered only under non-par individual products and non-par group products.

Non-Linked Insurance Products Regulations, 2019

These Regulations are applicable to all the products offered by the life insurers under the non-linked platform. The product structure was classified as participating products and non-participating products. The product filing documents required to clearly mention the following classification: a) Par/Non-par b) Life/Pension/General Annuity/Health. c) Individual/Group d) Savings/Pure risk premium product.

Issuance of policies in electronic form on meeting requisite criteria

IRDAI issued a regulation in June 2016 on issuance of electronic insurance policies, wherein it made it mandatory for the players to issue policies in the electronic form if the sum assured or annual premium exceeded a pre-set

amount. IRDAI also permitted players to offer discounts in premium rates to policyholders for electronic insurance policies in accordance with the rates filed under the product-approval guidelines.

Tighter rules on expense management

In May 2016, the IRDAI issued regulations to control the expenses incurred by the life insurance company to acquire customers. For insurance companies in operation for more than 10 years, the regulator capped the expense at 80% of first-year premium and 15% of renewal premium for players in respect of policies with premium payment term of 10 years and above. For players with less than 10 years of operations, the IRDAI provided a higher cap on expense due to high costs involved in the first few years of operations. The expense was capped at 90% of first-year premium and 20% of renewal premium for players in respect of policies with premium payment term of 10 years and above. The respective caps are higher for pure protection products.

Key regulatory changes pertaining to distribution

As per the IRDAI Exposure Draft dated August 3, 2022, the following changes are proposed in the IRDAI (Registration of Corporate Agents) Regulations, 2015 and IRDAI (Registration of Insurance Marketing Firm) Regulations, 2015 through the IRDAI (Insurance Intermediaries) (Amendments) Regulations, 2022:

- Increase in the maximum limit of tie-ups with insurers for Corporate Agents from the existing three for each category of insurance to nine for each category of insurance.
- Increase in the maximum limit of tie-ups with insurers for Insurance Marketing Firms from the existing two for each category of insurance to six for each category of insurance;
- Removal of the restriction on Corporate Agent (General) to place commercial lines of products having a total sum insured not exceeding rupees five crores per risk for all insurances combined.

Point of Salesperson-Life Insurance

An Insurer or an insurance intermediary authorized to solicit and market life insurance business can engage a “Point of Salesperson”. A “Point of Salesperson- Life Insurance” engaged by an insurance intermediary can sell the Point of Sales – Life Products of all such Insurers whose life insurance products the respective intermediary is authorized to sell.

Corporate agents allowed to tie up with multiple insurance players

The IRDAI notified IRDAI (Registration of Corporate Agents) Regulations, 2015, introducing the requirement for corporate agents to obtain registration from the IRDAI. Previously, Corporate Agents were only required to obtain a license from the IRDAI. Depending on the type of registration (i.e. General, Life, Health) a corporate agent is permitted to act as a corporate agent for a maximum of three life, three general and/ or three health insurers and is required to adopt a board approved open architecture policy on the same A Corporate Agent (Composite) is allowed to tie up with up to three life, three general and three health insurers.

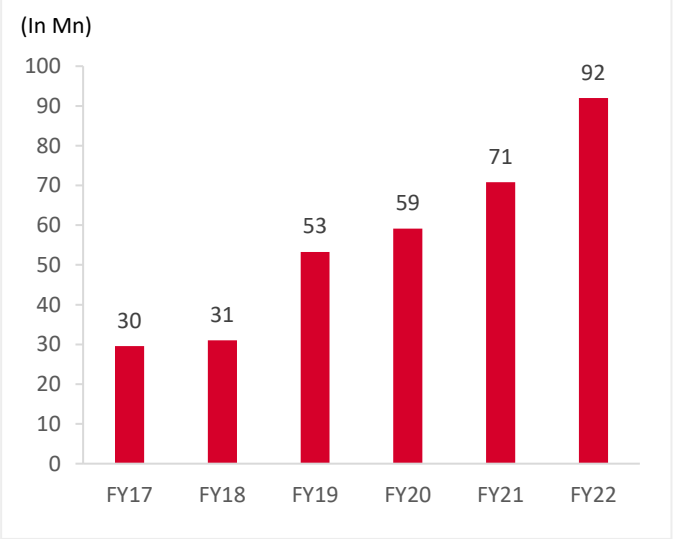
Introduction of web aggregators

In order to monitor the content on the websites of web aggregator insurance companies, the IRDAI introduced the Insurance Web Aggregators Regulations in May 2017. Web aggregators are companies registered under the Companies Act and approved by IRDAI, which maintain or own a website and provide information on insurance products of different insurers. As of 27th December 2021, there are 24 web aggregators registered with IRDAI.

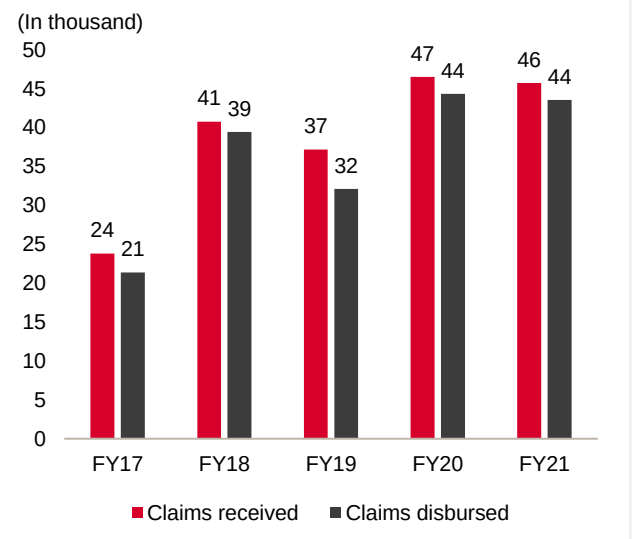
Financial inclusion initiatives - Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)

This scheme was launched in May 2015 to create a universal social security system, especially for the poor and the under-privileged. PMJJBY is a one-year life insurance scheme that can be renewed each year, which offers a life cover of INR 0.2 million for death due to any reason and is available to people in the age group of 18-50 years (life cover up to 55 years) at a premium of INR 330 per annum per member. This scheme is offered/administered through LIC and other Indian private life insurance companies. Due to such government-focussed schemes and expansion in the distribution network, insurance penetration, especially in rural and semi-urban regions, is expected to increase.

Cumulative enrolments in PMJJBY



Number of claims received and disbursed



Source: PMJJBY; CRISIL MI&A Research

In May 2022, the Government increased the premium rates of PMJJBY from INR 330 per annum to INR 436 per annum. As per IRDAI, the claims ratio (claims paid to premium earned) pertaining to policyholders on boarded through PMJJBY from inception of the scheme up to 31st March 2022 was 145.2%. Hence, in order to make the scheme economically viable the Government decided to increase the premium amount. The increase in premium amount will benefit the life insurance players with significant exposure to the scheme.

13.4 Digitization to be at the core of industry transformation

Advanced technology has already become an integral part of the insurance industry. Nowadays, an individual can easily compare different life insurance quotes across various players just by clicking a button. Managing coverage or checking the policy status can also be easily done via mobile app or insurer website.

Evolving digital trends coupled with changing customer and other stakeholder expectations is demanding transformation of existing business models. New and innovative business models across verticals will generate greater value and deliver better services for customers. Insurers are increasing focus towards technology to engage with consumers, and to provide real-time and convenient access to information.

Digital transformation offers insurers opportunities to rethink business operations in order to enhance customer satisfaction, reduce cost and prevent errors. For example, on the selling side, insurance has traditionally been sold on the basis of trust and relationships, but with technological progress, speed, flexibility and innovation will be brought into the equation.

Players looking to tap digital platform to push sales as well as improve operational efficiency

With increasing internet penetration, the use of digital medium to conduct financial transactions has substantially increased over the years. The first major digital adoption for the life insurance industry was issuance of insurance policy in electronic form. Players have tied up with platforms such as National Securities Depository Ltd NSDL and Central Depository Services India Ltd (CDSL), to enable policyholders to hold insurance policies in electronic form. Further, some players have also entered into contracts with digital players, to enable customers to make payments through their preferred channels.

Increasing use of online platform has also led to voluntary sharing of lot of financial-related information by consumers. Therefore, players are developing various tools to leverage the use of such data, which will help them to target the right set of prospective customers. Further, by analysing customer data, players also try to pitch the right set of products to customers. Post selling the policies, the players undertake predictive analysis to identify the probability of a customer renewing the policy. Therefore, effective use of technology will not only help players to identify right set of customers, but also to retain customers for longer period of time.

Though customers use digital medium to study and compare various life insurance products, final sale of policy is still being largely conducted through the intermediaries. On the other hand, the process of underwriting and data verification is undergoing transition, with customers not required to share physical documents with their agents. This helps in substantially reducing the turnaround time and also enhances channel productivity.

Thus, the digital channel is aiding customers to make informed decisions, which will help in increasing the persistency ratio for players in long run and will also reduce mis-selling of policies. However, over the long run, as percentage of end-to-end sales of insurance policies (customer identification to sale of policy) increases, operational efficiency of players will substantially improve, due to lower operating costs. Hence, players in the Indian life insurance industry are increasingly looking to increase sales and increase operational efficiencies.

Emergence of digital distribution channels

Given the increase in internet and mobile penetration, digital distribution of life insurance products will also play a bigger role going ahead. For fiscal 2021, around 9.2% of individual NBP came through the direct, web-aggregators and online mode, and this percentage is bound to increase significantly in the coming years. This development into a web-/app-based model will further drive scalability and reduce costs for insurers.

Besides, increasing digitisation will help in increasing the penetration of insurance players as:

- Processes such as purchase of insurance products and filing claims can be done remotely
- Applications can be developed or modified to facilitate financial literacy, which could be especially effective in small towns and rural areas

- By digitalising the insurance process, clients in remote areas will not worry about maintaining physical documentation. Further, online premium payments can also be done effortlessly through digital modes

While new digital distribution channels are emerging, individual agents and banks as distributors also play an active role and the one-stop-shop model of providing multiple services through the optimum utilisation of technology is clearly sustainable. Thus, it is vital for life insurance companies to continue to use the agency and the bancassurance channel in selling the insurance policies. Given the awareness of life insurance in India, the array of policy options available, the requirement of an individual to help customers select the right policy as per their need would persist. Digital distribution would thus help complement the physical distribution channel and make the process more efficient.

Key areas in insurance processes where digitalisation is finding application

Contactless on-boarding	Distribution	Underwriting and risk management	Claim processing
•Smarter ways to on-board customers such as paperless login with digital consent, electronic payments and application tracker •Leverage analytics for providing pre-approved offerings to customers for whom no medical tests are required	•AI-driven chatbots to solve customer queries, fill out applications forms and walk customers through some predefined process •Lead management system (LMS) with data analytical models enabling sales team to tap in to existing opportunities •Customers can get most of their queries and requests addressed instantly at their fingertips through visual IVR or speech IVR	•Tele or video based medical assessment •Implementation of AI to evaluate various customer data thus enabling more efficient policy underwritting	•Companies use multiple digital enablers like WhatsApp, mobile app or websites where customer could register, download and upload documents without needing any physical assistance •Insurers are employing robotic process to automatically validate death certificates and reduce the turnaround time

Source: CRISIL MI&A Research

Regulatory focus on digitalisation in insurance sector

With the COVID-19 impacting worldwide, IRDAI also have moved in line with changing time to digitise the insurance industry. IRDAI has introduced the various steps to facilitate alternate modes of digital contact, particularly with respect to policy servicing and claims, in order to ensure continuity of business operations. IRDAI has brought the following measures:

Paperless KYC

IRDAI has allowed insurance companies to avail Aadhaar Authentication services of the Unique Identification Authority of India. As a result, KYC is done in just 2 minutes which requires user to provide OTP from Aadhaar registered mobile number.

E-consent of proposal

Due to COVID-19, the traditional approach of filling physical proposal forms, obtaining wet signatures and the subsequent movement of physical papers has been affected. IRDAI has allowed insurers to obtain customers' consent without signature on the hard copy. Insurers will have to send the completed proposal form on registered e-mail ID or mobile number of customers in the form of an e-mail or message link. Customers have to click on the confirmation link to validate the OTP shared.

Issuance of e-policies

In 2016, IRDAI had said that if policies are solicited through an electronic mode, insurers were required to send the policy electronically and also dispatch a hard copy. Exemption for a physical copy was provided only where the policy was issued using an e-insurance account (eIA). Insurers were unable to send the policy contracts on time due to the pandemic and hence IRDAI has allowed Insurers to send all life and health insurance policies electronically to the policyholder's e-mail ID. The free look period can be started only after the receipt of policy contracts; however, now Insurers shall confirm the date of receipt of the e-policy through a call or other means and preserve the proof so that the free-look period can be calculated from that date.

14 Assessment of Ed-tech and e-learning in India

14.1 India education landscape is among the largest market in the world

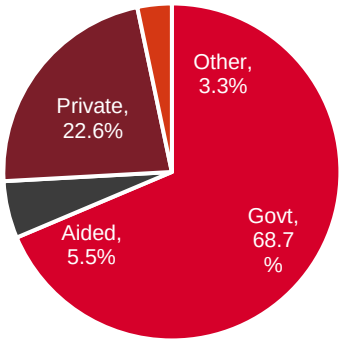
India's education system is one of the largest systems in the world. With population of 490-500 million under the age of 20 years, India has large pool of student to target. According to Unified District Information System for Education (UDISE) and All India Survey on Higher Education (AISHE), India has more than 265 million students enrolled in approximately 1.5 million schools as of fiscal 2022 and around 38.5 million undergraduate and postgraduate students enrolled in 42,343 colleges, 1,043 Universities and 11,779 Stand-alone institutions across India as of fiscal 2020.

Formal education in India spans primary and secondary school education, graduation, post-graduation, and diploma courses.

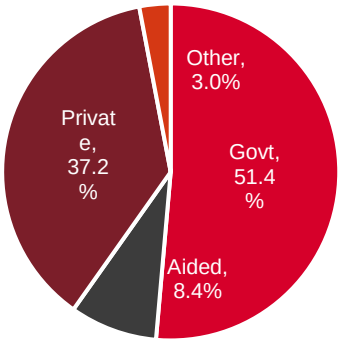
School Education Infrastructure in India

Particulars	2021-22
Number of schools	1,489,115
Number of teachers	9,507,123
Number of Students	265,235,830

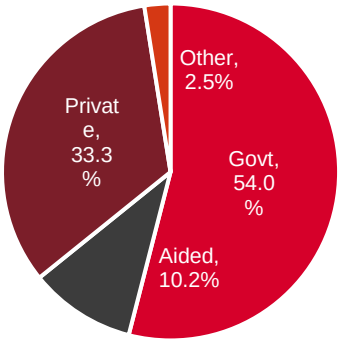
Source: UDISE, CRISIL MI&A Research



Total number of schools



Total number of teachers



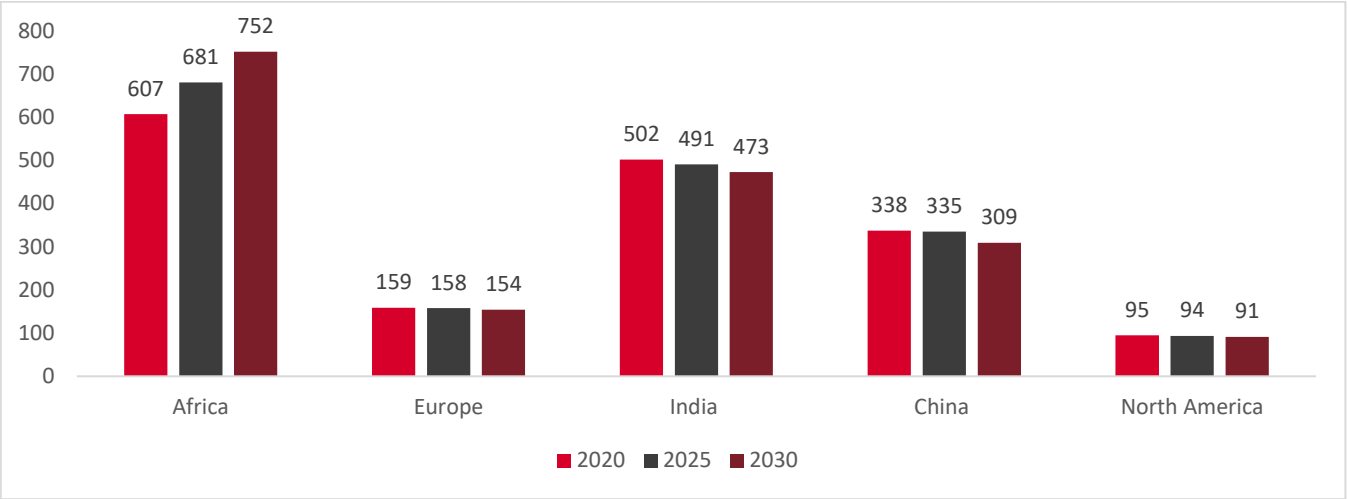
Total number of students

Source: UDISE, CRISIL MI&A Research

Countrywide comparison of population under education age group

As per UN population estimates, India has the world's largest population of over 500 million in the age bracket of 5-24 years in 2020, which provides a great opportunity for the ed-tech and education sectors for expansion of education related products and services.

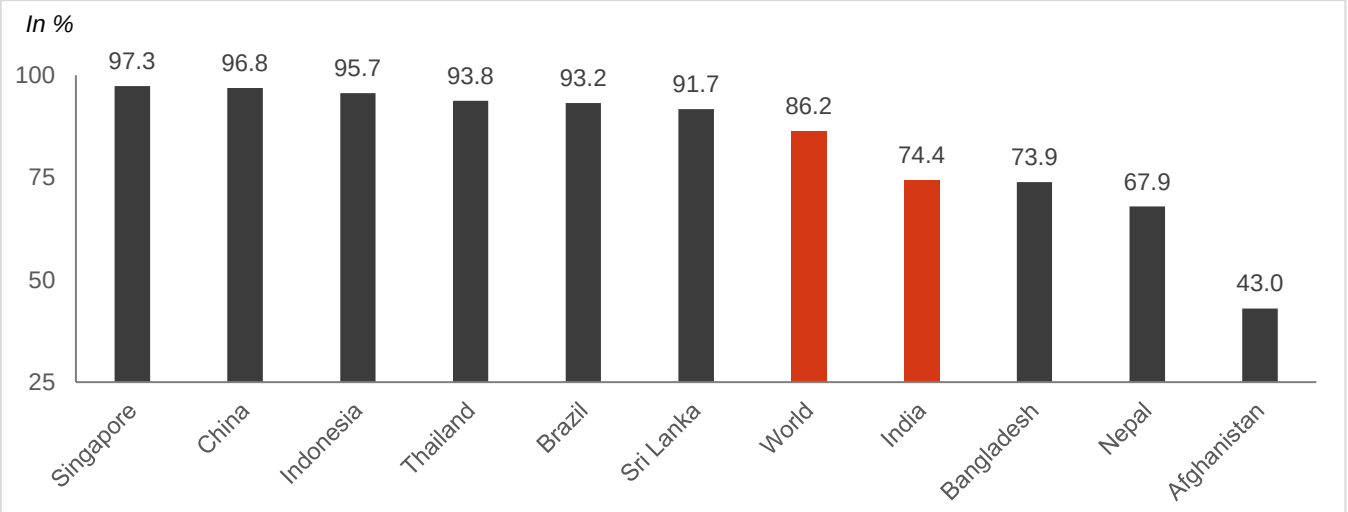
Total population in education age group (5-24 years of age)



Source: World Population Prospects 2022, CRISIL MI&A Research

As per the world bank, India is the second largest country in terms of population with total population of ~1.4 billion people in 2021. Considering ~44% of it is below 0-24 years of age, there is humongous potential for education/ed tech companies to expand their reach to the students. The education penetration is low specially in the rural region due to low availability of teachers/schools, providing huge scope for the ed-tech companies to expand as well as for new companies/start-up to grab the under penetrated market.

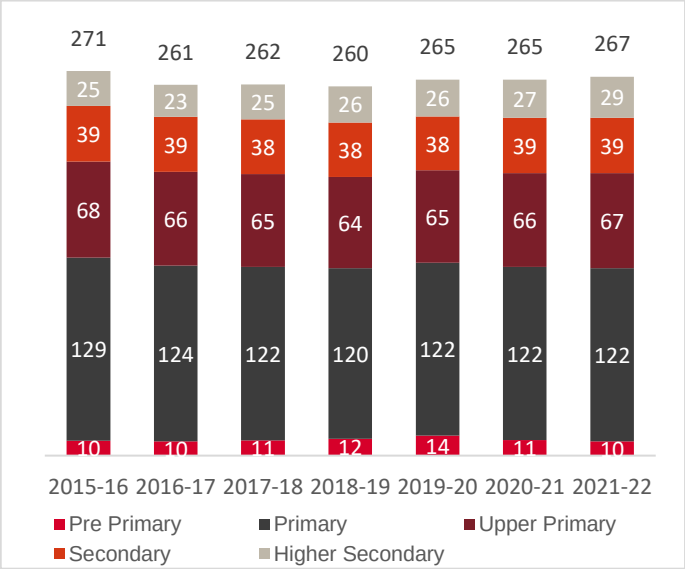
Literacy rate (2018)



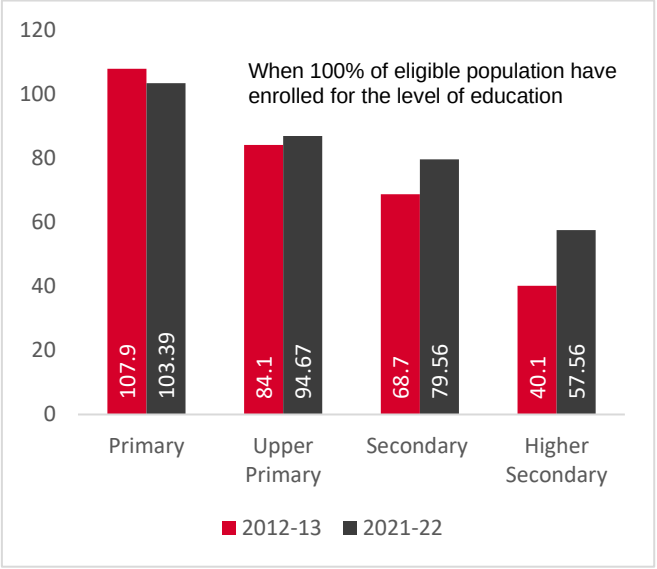
Source: World Bank, CRISIL MI&A Research

Student population and enrolment ratio

Total number of students (in million)



Enrolment ratio



The United Nations Educational, Scientific and Cultural Organization (UNESCO), describes "Gross Enrolment Ratio" as the total enrolment within a country "in a specific level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education

Source: Seshagun, Aishe Report, CRISIL MI&A Research

Gross enrolment ratios (GERs) have scope for improvement in higher secondary and education

As can be seen in the GER chart, there has been increase in GERs for upper primary, secondary, and higher secondary. GERs primary education declined as the ratio was more than 100% indicating that a greater number of students were enrolled than the age group for the level of education. With penetration of basic education to all, the primary education outstanding population decline leading to lower GER for primary education. The K-12 segment typically reports a lower GER vis-a-vis the elementary segment as well. One of the reasons for the low enrolments (below 100) is the lack of awareness about the importance of education. Many students are forced to pursue employment before completing their K-12 education to support their households. This situation is further exacerbated by a lower number of schools delivering education at higher grade levels (grades 9-12), which is one-fifth of schools delivering education at the elementary grade level (grades 1-8).

Consequently, drop-out rates plummeted from elementary to secondary. Other problems such as weak infrastructure, unavailability of schools, and vacant teacher positions also have a bearing on the attendance and enrolments in K-12 schools. Ed-tech is expected to resolve such issues in the education sector and bring more population under the gamut of secondary and higher education.

Higher education in India characterised by low but improving GERs

According to AISHE, the percentage of students enrolled in higher education in 2019-20 was 27.1% against 21.5% in 2012-2013. The 75th National Sample Survey Organisation's (NSSO) survey data reveals that 10.6% of the country's population above 15 years of age are graduates (21.7% of urban population and 5.7% of rural population) in 2018 indicating significant disparities in higher education. The number has improved from 8.2% of the country's population above 15 years of age being graduates and above (17% of urban population and 4.5% of rural population) in 2014 as per the 71st National Sample Survey Organisation's (NSSO) survey data.

The country's education sector is also plagued by a shortage of well-trained faculty, regional disparities in enrolments, vacant faculty positions, poor infrastructure, and outdated curricula.

Within K-12, the GER for the elementary segment (standards 1 to 8) is expected to be 70-80% in FY22. During the same year, GER in higher education was estimated at 20-30%, casting doubts on whether the government's target of 100% GER by 2030 will be attainable as per the New Education Policy 2020.

Covid-19 compelled the education institutes to adopt online methods

Both formal and non-formal segments of education have shifted to online mode by conducting the classes through online channels on account of pandemic. The mode of communication has also changed from the offline mode to the online mode. However, many institutes have successfully maintained teacher-student interaction and ratio by using online applications to conduct classes and exams. Institutes are using a combination of offline-recorded videos and online lectures.

Institutes that were not able to adopt to the online mode remain dependent on study material, which is distributed and collected on specific days.

E-learning will pave the way for advance learning methods in ed-tech

Digitisation of education remains one of the topmost priorities of the Government of India. With the internet penetration rate in India at ~61% in March 2022, as per Telecom Regulatory Authority of India, the market is conducive for penetration of ed-tech market. Many e-learning portals have been set up in the wake of the pandemic to provide uninterrupted access to learning. They are performing well as an increasing number of learners are enrolling in online courses — the new normal since the onset of the pandemic.

Starting 2020, Indian universities and colleges, which were earlier not permitted to offer more than 20% of a degree online, have lifted the restrictions on online learning to increase access to higher education and improve their global ranking. Many edtech companies are offering learning management resources, including blended learning, 3D and do-it-yourself (DIY) kits and AI-based experiential and interactive learning to improve the learning experience.

India’s ed-tech is marked by presence of several start-ups

India ed-tech landscape is several players across various offerings. The ed-tech landscape in India has around 7,000+ start-ups in India as per industry sources. Start-ups have entered the market in 2010 onwards and are developing their offerings and expanding their reach across in India. Covid-19 pandemic has increased active user base for ed-tech app and the segment has seen rising penetration even in tier II and III cities in India.

Ed-tech vertical and players

Verticals	Players	Verticals (B2B)	Players
Child development / preschool learning	Kutuki, Playbees ABC, Shape Builder, Jumpstart, Daniel Tiger’s Grr-Ific Feelings, Wheels On the Bus	School learning management	WizIQ, Schoolguru, Lead School, Next Education, Disprz
Supplement education for K12	Byjus, Vedantu, cuemath, mastree, Unacademy, Doubtnut, xtramarks, Khan Academy	Digital tutoring enablers	Classplus, teachmint, classpro
Test preparation	Toppr, Byjus, Unacademy, radeup, testbook	Education services (B2C)	Byjus, Unacademy, Vedantu

Certifications and online courses - academic	UpGrad, simplilearn, Greatlearning, edupristine	Finance / Loans / ST lending	Auxilo, Eduvanz, mPokket, Pocketly, RedCarpet, Sahukar
Language classes	enguru,cultureAlley, englishbolo	Gamification	Quizizz, Miko.ai, PlayShifu
Creative, hobby, adult engagement classes	Yousician (Finland), Udemy (Yoga), Skillshare (USA)		
Executive / employee training program	Eruditus, Simplilearn, Virohan (healthcare)		
Skills development certifications	Coursera, Simplilearn, UpGrad		

Note: List is not exhaustive

The names mentioned above are brand names and not legal names of respective entities

Source: CRISIL MI&A Research

Product offerings in edtech are widespread, thereby making it a highly fragmented market

K-12		
Type	***Details***	***Companies***
K-12 Supplemental Education	offers online learning materials which supplement school curriculums	e-Basta, ePathshala
Coaching/tutoring & test prep	guiding students in K-12 education in coaching to develop in-depth subject expertise	Byju's, Vedantu, Classplus, embibe
Digital content & resources	Resources for learning	Leadschool, Instasolv, Quizizz
Steam, Coding & Language Learning	Edtech companies helping provide skill/enhancement programs	Cuemath, mastree, doubtnut, FrontRow, Enguru, Englishbolo and Cullurealley
XR, Games & stimulation	Fun and Learn concepts	Fintobox, Stepapp, EduIsFun
Discovery and admissions	Help for admission and other details	AdmitKard, edushala, Univariety
Learning Management systems	Software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs or learning and development programs	Schoolguru, Zeus Learning, eZnetLMS
Post K-12		
Higher Education	Distance-based degree programmes	Keystone, IGNOU
Test Prep	Postgraduate admission tests, professional certification exams and Government job entrance exam preparation	Unacademy, Toppr, Gradeup
Technical Skilling	Reskill/upskill programmes, typically for technical or functional new-age skills	Udemy Upgrad, Simplilearn, Edruditus, Upskill

Note: The K-12 segment represents education from kindergarten to class XII and is the largest segment within the education space in India. It can be further divided into primary (1-5), upper primary (6-8) secondary (9-10) and higher secondary (11-12) levels.

Source: CRISIL MI&A Research

Ed-tech is still at nascent stage in India with major players entering the market in the last decade (2010's)

Started in year	Ed-tech company	Offerings
2007	Extramarks	K-12 supplementary learning
2009	Simplilearn	Portal for professional certification programs
2011	Byju's	Coaching, K12 subject prep, competitive exam prep

2011	Cuemath	Coaching, live class for school students
2013	Toppr	Live class for K5-K12, JEE/NEET prep
2014	Vedantu	Coaching, live class for K5-K12, JEE/NEET prep
2014	Eduis fun	learning platform through gamification
2015	Unacademy	Coaching, exam prep

Source: CRISIL MI&A Research

Growth drivers in the education industry

Rapid urbanisation, higher disposable income, India's current demographic profile, rising fees, lower penetration and an increase in enrolments are the education industry's growth drivers.

Rapid urbanisation

India's average annual urban population growth rate was almost double its overall population growth rate. Urban areas offer more job opportunities and higher pay. They also provide better access to quality education inducing people to spend more on education. There are more schools in proximity to households in urban than in rural areas, resulting in higher enrolments and lower dropouts.

Rising household spending on education

Rising disposable income increases spending by households in all categories, with education benefiting from this increase. Households set aside a large portion of their monthly income for securing quality education for their children.

Demographic profile

As per UN population estimates, by 2025, a significant share of India's population will be in the working age group; currently, more than 38% of India's population falls in the under-19 age group, indicating a mammoth demand for education at all stages.

Low penetration in education gives room for growth and expansion

India has low education penetration compared with the world, which is evident from its low literacy rate and GER across grades. To address this, India will have to invest in educational institutes. GER is especially not sustained in higher grades. Enrolments declined at higher levels due to teacher absenteeism, high pupil-teacher ratio and dropout rate, and poor infrastructure.

Demand from private schools – highly underpenetrated market

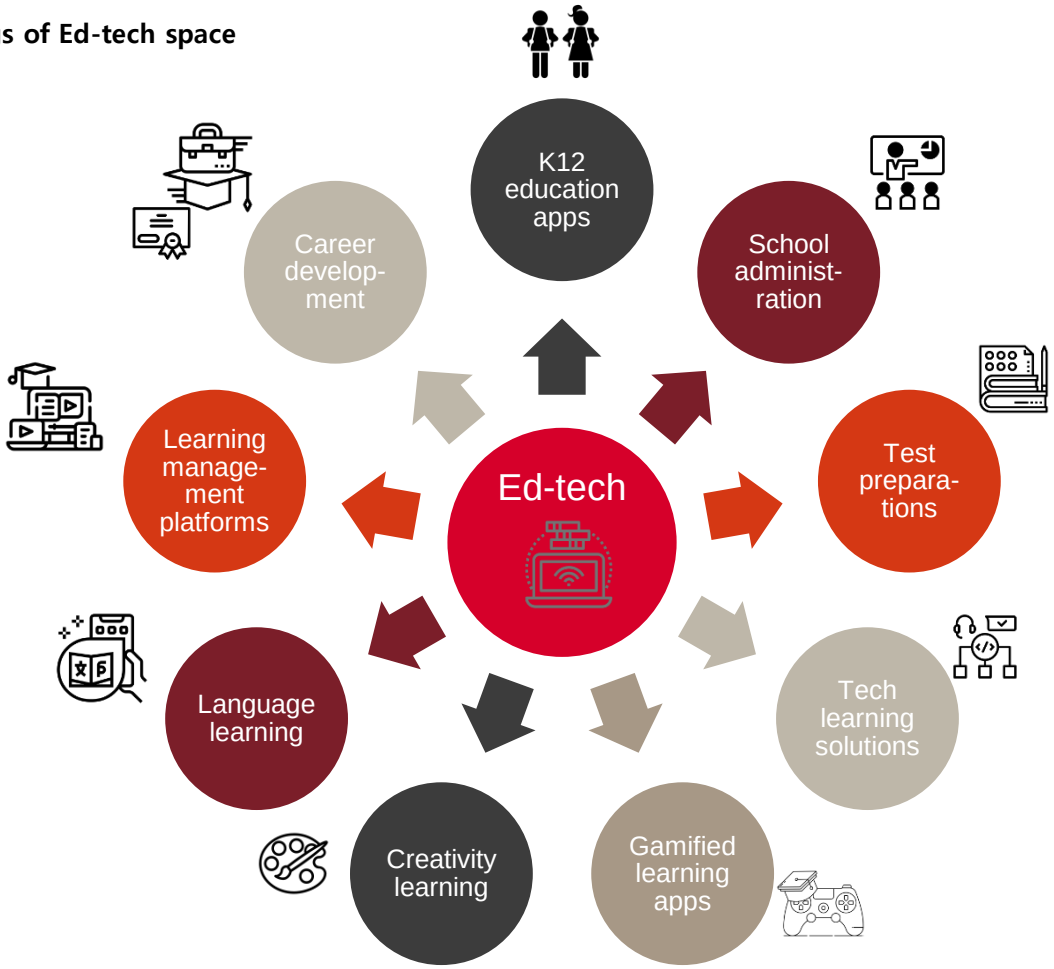
Private digital education has expanded rapidly since FY2018, up 16% annually, and is estimated at Rs ~13-18 billion as of FY22. The key driver has been robust demand for value-added products from schools (primarily private schools in relatively affluent urban areas) looking to enhance their curriculum and differentiate themselves. Players in the segment have been marketing aggressively to generate volume, at the cost of margins, which has supported growth. Robust growth is underscored by the huge, but untapped, potential in the market. The penetration of digital education in urban private schools stood at 55-60% (schools with at least one digital classroom per school) in FY22.

14.2 Key offerings in Ed-tech space

Education plays a significant role in balancing the socio-economic fabric of a country. Basic education is key to achieve a better quality of life, and higher quality of education warrants an all-round development of citizens and growth of economy. It is the country skilled human force which helps is nation building making education a very important parameter for growth.

Education technology (edtech) is an area of technology that facilitates and enhances learning through the development and application of information technology (IT) tools and mode of teaching and evaluation.

Key offerings of Ed-tech space



Source: CRISIL MI&A Research

The ed-tech industry's key verticals are as follows:

Learning and coaching: This segment offers online learning materials that supplement school curriculums, as well as provide tutoring and coaching to students. It mainly targets students up to Grade 12 and these apps have seen the widest adoption in India (50-60% share) from increase in its top 3 players.

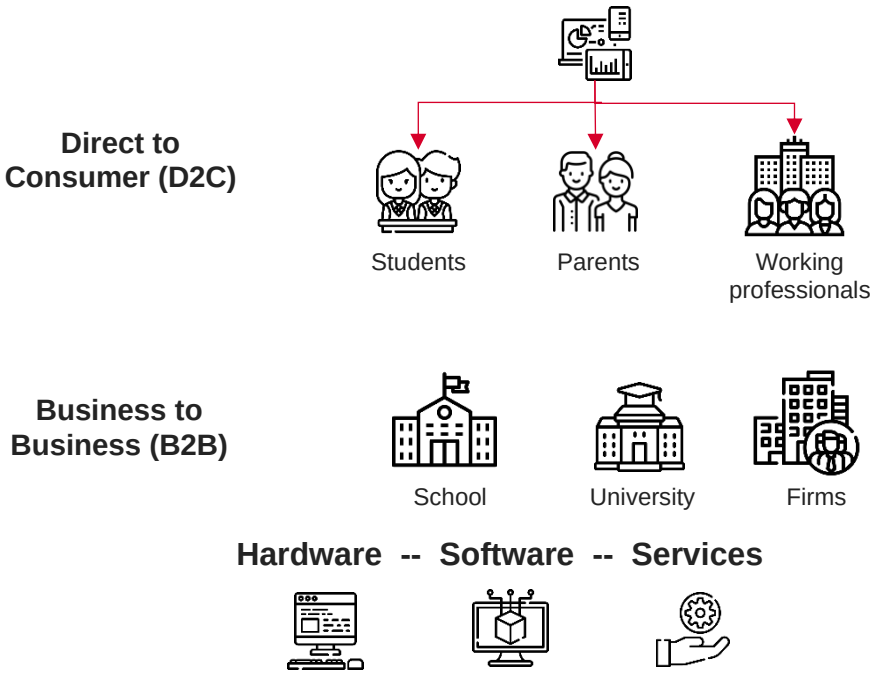
Test preparation: This segment helps students prepare for tests after K-12, with a focus on IIT-JEE, CAT, UPSC, SAT, and medical entrance tests. It is one of the largest evergreen categories in India, due to to the country's obsession with grades, admission to engineering courses and government jobs.

Hobby or skill enhancement: Edtech companies also provide skill/enhancement programmes. It is essentially a learning and community platform, where students can pursue their non-academic interests and hobbies such as language classes, art and craft, and coding.

Career training and skill development: Skill advancement is essential to stay updated with evolving industry dynamics. In this context, edtech startups have leveraged this opportunity by providing avenues to expedite skill development, upskilling, and reskilling. These programmes bring engineers and software developers up to speed with the latest and most prevalent technologies

Solution and platform providers: IT solution providers provide ed-tech platform and system offerings for traditional and ed-tech players to develop ed-tech products and services

Ed-tech business model landscape



Source: CRISIL MI&A Research

Private sector business models in the education sector

Segment	Offerings	Remarks
Vendors to educational		
ICT - Information and Communication Technology	ICT equipment (hardware)	
Software systems	LUMS, KM etc.	Core Projects & Technologies
Multimedia	Pictures and videos	
Bundled products	ICT + Software system+ Multimedia + support personnel	Educomp- SmartClass, Everonn-Vitels
Private educational institutions	Educational services: Pre-School, K-12, Higher education and continuous education	Oberoi schools, Manipal University, DJ Sanghvi College of engineering etc.
Coaching / Certification providers	Supplementary educational services	
Coaching - Supplement to Formal	K12 supplementary education services	Unorganised and private regional or local chains, Mahesh Tutorials
Coaching - Entrance Exams	Entrance exam preparations for various levels of educations – Graduation entrance (Engineering, MBBS, etc.), MBA entrance, etc.	Career Launcher
Certification - Technical & Soft Skills and coaching for professional certification		NIIT, AutoCad
Test administration	Test infrastructure and exam administration	Prometric, VUE

Source: CRISIL MI&A Research

Technological innovation empowering traditional education system

Traditional methods of teaching are upgraded by technological advancements, such as artificial intelligence (AI), robotics, cloud computing technology and augmented reality (AR)/virtual reality (VR), and their integration into learning. These cross-curricular learning opportunities in the ed-tech sector are expected to enable institutes and teachers to streamline resource commitments, as well as develop students' knowledge through practical and cross-curricular applications. Technology helps to impart knowledge by holistic learning experience and visual appeal which led to better understanding.

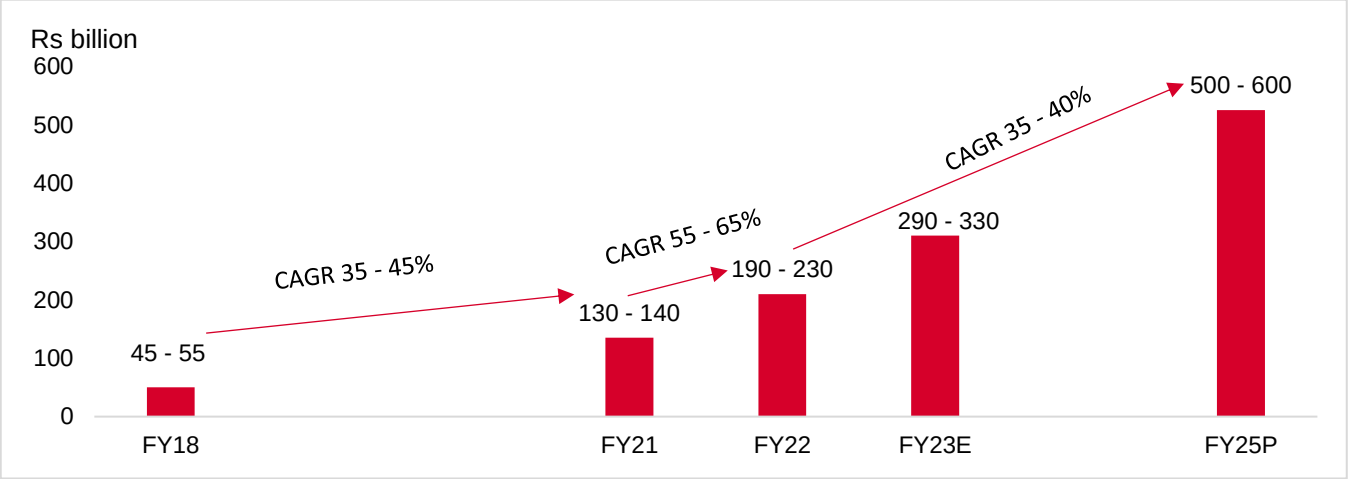
Developed economies, such as the US, the UK, and Germany, are leading in developing and introducing innovative ed-tech offerings, supporting education administration, student and community engagement, and reducing teacher workload. Emerging economies, such as India, have a lower market share, but are focusing on utilising technologies to provide access to education. As a result, ed-tech is anticipated to see significant growth in such economies to educate the rapidly growing population.

14.3 Outlook of digital learning industry in India

Digital learning market to grow at a CAGR of 35-40% over fiscals 2022-25

Digital learning market comprises of e-learning and digital learning solutions in private and government schools. Digital learning market size witnessed growth at CAGR 35-45% between fiscal 2018 and fiscal 2021. Some part of growth was due to many students explored digital learning in the first few months of lockdown since March 2020. Most players offer freemium products in this category and offer discounts to attract students. However, fee-paying students accounted for only smaller portion of current users, below 10%. The segment witnessed even higher year-on-year growth of 55-65% in fiscal 2022 as many students continued to rely on the same.

Digital learning market size in India



Source: CRISIL MI&A Research

Digital learning is expected to grow at a CAGR of 35-40% over fiscals 2022-25

This segment has benefited from the lockdown, as in fiscal 2021, players operating in digital learning space received funding that was 3x-4x funding received in fiscal 2020. CRISIL MI&A Research estimated the digital education industry to be worth about Rs 190-230 billion in fiscal 2022. Over the next three years, the industry is projected to grow at a CAGR of 35-40% as e-learning gains momentum to reach Rs 500-600 billion in fiscal 2025 driven by

demand supported by COVID-19 pandemic movement restrictions, higher penetration of ed-tech learning at home and schools, higher demand for skilling at corporate employees and higher education students, development of technology and rationalisation of prices of new tech solutions.

Private schools will help gain momentum

As per CRISIL MI&A Research, over the forecasted period from fiscal 2022-25, e-learning's share is projected to rise at 35-40% CAGR in private schools. In contrast, demand for digital education from government schools is expected to decline at 0-5% CAGR as players reduce their exposure to this low-margin segment. The e-learning segment's revenue will outpace the other two segments as penetration cost declines with the decrease in the cost of high-speed internet access and smart devices, and the growth of online test prep and app-based learning.

Between private and government schools, players are continuing to shift their focus towards private schools. Demand from private schools is expected to continue to grow as they try to gain a competitive edge through digitisation.

Digital learning has lower employee cost than other segments, but content management cost is high

Digital learning has lower employee cost compared with other segments as it has recorded and live lectures. The digital segment employee cost accounts for 20-30% of the total expenses; however, content management cost is high at 30-40%.

14.4 Drivers for digital learning in India

Increasing competition for entrance exams and higher cut-off marks

In India, a student's performance is measured based on test results, with the focus on marks/grades. Also, high cut-off marks due to increasing competition (high student interest in select few reputed institute) have mads competitive exams hard to clear. In past few years, competition in Indian exams has become so intense (less than 10% of students clear the entrance tests) that many students start enrolling for exam preparation courses 2-3 years in advance. Several coaching classes also offer courses bundling both curriculum and test preparation courses in online form, thereby increasing student enrolment for at least two years.

Rising internet penetration

The major barrier to growth of online education was connectivity, especially in rural areas. The number of wireless internet subscribers is expected to increase to ~1150 million by fiscal 2026. With improvement in network infrastructure, penetration, declining mobile data tariff and proliferation of low-cost data handsets, CRISIL MI&A Research expects the market for online education to grow rapidly.

Increase in urban private schools in past five years

Urban private schools in India form the core target market for digital education. Estimated enrolments in urban private schools has increased at 6-8% CAGR during FY18-21. However, estimated penetration of digital classrooms remains low at about 55% as of fiscal 2022. A large under-penetrated market and possibility of more urban private schools in next five years imply significant growth potential for digital education industry. Penetration of digital education services in private schools in India is set to deepen with schools seeking competitive advantage and new product offerings.

Vocational education: marked by growing popularity among the youth

Vocational education offers a large potential market for private players. It imparts specific skill sets to individuals, who have completed only their basic education, thereby improving their placement prospects. Increased requirement of corporates for trained manpower with job-specific skill sets and rising dropout rate after K-12 education are the main reasons for growth of vocational education institutions.

Government focus on vocational training space

The government has taken several initiatives to promote skill development or vocational training in the country. Industrial training institutes and centres (ITI/ITC) being run by the Ministry of Labour and Welfare, polytechnics, National Institute of Open Schooling (NIOS) and Vocationalisation of Secondary Education scheme, being run by the Ministry of Human Resource Development, are some examples. In 2009, the government adopted the National Skill Development Policy (NSDP), which is targeted to skill 500 million people by 2022. In July 2015, this target was updated to cover 4 billion people.

Recent updates in the fiscal budget 2022-23 include setting up of e-labs for skill development across many areas to bolster focus on inclusive education. Impetus was also given to adding vocational education as a part of secondary education in schools and colleges which is expected to increase focus towards the same.

Increased need for trained manpower with job-specific skill sets

Rising investments by companies to improve quality and productivity of employees have been driving growth of the soft skills development industry. Although most sectors require vocationally skilled persons, the intensity varies. Some sectors, such as organised retail, auto, construction, IT-ITeS and banking and financial services, require higher proportion of vocationally skilled employees than others. These sectors will drive demand for vocational education.

Increase in the working-age population and labour force

Majority of Indian population falls in the working-age group (15-59 years). According to latest estimates, the total population has grown from 1,200 million in 2011 to ~1390 million in 2021, while share of workforce in total population has increased to 64% during the same period.

High drop-out rate in schools

Nearly 50% of students drop out of school by the time they reach the higher-secondary level. These drop-outs add to the unskilled labour force and have to settle for low-paying jobs or no jobs, while the industry faces a shortage of skilled workers. Vocational training can thus play a major role in bridging the gap between supply and demand of skilled labour, by equipping this section of the population with the wherewithal to meet industry requirement. Further, lack of practical training leads to a mismatch in demand and supply for vocationally skilled manpower, precipitating need for vocational training.

14.5 Role of new age edtech solutions and infrastructure needed for developing the market

The government has taken initiatives to improve the reach of education by making it digital and interactive. Still the Indian education system is facing problems such as poor quality, cost, and access. The problems can be resolved through new-age technologies, such as cloud computing, artificial intelligence, virtual reality, and augmented reality.

Cloud-based services

With the help of cloud-based technology, the problems of access and lack of infrastructure in education can be solved – students can access regularly updated content (videos, expensive books, interactive lab simulations) on their mobile devices from anywhere.

Artificial intelligence

With AI, it has been possible to create adaptive learning technology, which facilitates students in managing their own learning. It provides every learner personalised courses based on their ability and performance. It analyses a vast pool of data to tailor the content as per students' interest and knowledge. Based on this, adaptive learning technology appropriately assesses individual differences of students and creates learning paths for every student.

Virtual reality/augmented reality

The use of AR/VR in education is of paramount importance, for it provides a cost-effective solution to study the phenomena or environments that are difficult or impossible to replicate in real life, such as space. These technologies can provide learners with simulated environments, where they can develop their skills without the real-world consequences of failing.

Gamification

Gamification in education is aimed at increasing learners' motivation and engagement by incorporating game design elements such as storytelling, problem-solving, badges, levels, and points in educational environments.

By designing lectures as a game, educators encourage students to face and accomplish various challenges and goals. This promotes higher student engagement and could help students retain knowledge more effectively. It also helps students reframe subjects they may consider burdensome or boring as engaging and fun.

Learning management systems

Learning management systems (LMS) help teachers deliver online lessons, share reading materials, and grade assignments. These platforms can streamline much of the work for teachers by centralising a number of features on one platform, including the tools needed to run a virtual, hybrid, or in-person classroom, as well as assisting with tracking student progress and connecting with parents.

Tech-led private labelling of education

Technology has put the power right in the hands of teachers and creators, the real owners of the knowledge. With tools such as Zoom and Canva – a self-publishing software – a teacher is no longer reliant on an intermediary like a publisher or a school to get her knowledge across to students. While there will be concerns about quality control, public ratings and review will weed out inferior quality, letting genuine teachers and strong content thrive.

IOT to build digitally wired classrooms

IOT will play a key role in universalising education and creating connected experiences for students. Imagine a remote classroom with an IOT-enabled black board. A remote teacher can virtually demonstrate concepts on the remote connected dashboard, bringing concepts alive for the class. Seattle-based education IOT startup Promethean builds interactive ActivWalls for schools equipped with natural language writing, dry erase and multi-media display. Devices such as Alexa can double up as study buddies by providing contextual answers to a child's questions.

Skill development

For K-12 and test preparation, the edtech start-ups would **expand into skill-development initiatives across the industry and development expertise in learning management solutions**. The conventional education system has had limited impact on redressing issues that India's economy is posing. From developing new skills to re-skilling and up-skilling initiatives, university-level courses have not created adequate levels of traction. This is where the ed-tech revolution has shown the potential.

More than half of India's workforce could need re-skilling and up-skilling over the next two years to meet the industrial demand for new skills. Emerging skill requirements would be focused primarily on technology-led design and programming, complex problem solving, reasoning, ideation, emotional intelligence, critical thinking, and analysis. In addition, India's working-age population accounts for 67% of its total population of 1.3 billion people, which makes it imperative for edtech companies to expand their focus to include skill-development initiatives.

Factors such as the deep penetration of the internet and the rampant use of smartphones and other electronic devices have spiked the online content consumption in India. This has also, in turn, impacted India’s addressable market for edtech products and services. The report also noted that it is the youth of the country that is driving the adoption of edtech products and services in India. These two factors have exponentially increased the capitalisation opportunity in Indian edtech. This is seen in the business done by edtech startups over the last two fiscals. Growth in digital learning space have been strong with market growing at 25%+ growth rate.

14.6 Government initiatives to support ed-tech

There are numerous initiatives and programmes launched by the government of India and the MHRD for students. The digital world and e-learning are expanding their presence globally. Here is a list of some digital initiatives launched by the MHRD for school students and for those seeking undergraduate and post graduate education.

Shagun ‘online junction’

Shagun is an online platform for school education, launched by the MHRD. The Department of School Education and Literacy, under the MHRD, and all states and union territories (UTs) have launched several e-learning platforms on the Shagun online platform. The primary aim of the Shagun is to facilitate both teachers and students with a platform where they can interact through digital medium for further learning. There are three e-learning platforms under Shagun:

National Repository of Open Educational Resources (NROER)

With about 16,000 registered users and more than 14,500 e-learning resources, NROER is one of the excellent initiatives of the MHRD. Through the NROER platform, students will get an exposure to e-libraries, e-books, e-courses, as well as a chance to participate in online events and theme-based education. Apart from this, students can access the website in both Hindi and English languages

DIKSHA

The MHRD has launched the National Digital Infrastructure for Teachers (DIKSHA) portal to equip teachers from the first to 12th classes into the world of e-learning. The platform is available for both teachers and students requiring learning material. The portal is available in multiple languages for students. In the first few weeks of the lockdown, DIKSHA had over six million views

e-Pathshala

Through this web-portal, students from first to 12th classes will be able to access audios, videos, e-books (e-pubs) and flip books. The digital repository has been made available by the NCERT to make sure that students do not miss out on any important concept taught in classes. E-Pathshala is also available in several languages

Swayam

An initiative of the government of India for students pursuing education from class ninth to 12th and also for the aspirants seeking undergraduate and post-graduate level degree programmes, Swayam facilities study material at one destination. Students can access study material in the form of video lectures, reading material, self-assessment tests, online discussions and sessions for clearing doubts. The portal is connected to national coordinators, such as AICTE, NCERT, IGNOU, UGC, NPTEL, NIOS, IIMB, NITTTR, and CEC for delivering updated and excellent quality content to the aspirants. Students registering for the courses at Swayam need not pay any fee, as the course is free of cost; however, to get the certification, registration is required, for which a minimal fee has to be paid.

Swayam Prabha

Swayam Prabha is a collection of 32 DTH channels, which run 24x7 for students. Every day, a new content of at least 4 hours duration is floated on the website, which runs five times in a day. Top education bodies of the nation, such as NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS provide content to students from classes 1st to 12th classes. Additionally, undergraduate and postgraduate aspirants can get access to interactive learning through this medium.

There are several other platforms, such as:

National Academic Depository (NAD), run by UGC, has tie up with about 55 school boards, 359 state universities, 123 deemed universities, 47 central universities and 260 private universities.

National Digital Library of India, run by the MHRD under its National Mission on Education through Information and Communication Technology (NMEICT), to provide content to not just school students but also those pursuing higher education and Ph.Ds.

Virtual Labs is another key initiative of the MHRD and the government under the mentorship of NMEICT. It is a consortium of 12 IITs, which aim to disburse online classes and study resources through virtual labs, wherein 700+ virtual experiments are designed and promoted for the aspirants to study and understand.

National Education Policy (NEP)

The edtech sector will get a further boost from the newly released National Education Policy (NEP), 2020, which promotes the use of technology to improve multiple aspects of education. The policy proposes to create a body, called the National Educational Technology Forum (NETF), to provide a platform for free exchange of ideas on the best use of technology for enhanced learning, planning, assessment and administration for education.

The NEP 2020 recognises the need to leverage the advantages of technology while acknowledging its potential risks and dangers. It emphasises the need for carefully designed pilot studies to determine the benefits of online education. The existing digital platforms are to be optimised and expanded to meet the challenges, with the aim of providing quality education for all. To this end, the focus on Digital India campaign will be ramped up and teachers will be given the required training to become effective online educators.

The policy, a much-needed revision of the system of education prevalent for 34 years, highlights the need to create enlightened students, who are productive, empowered, and contribute to the economy. It stresses the need for education in the mother tongue or regional language. It emphasises Early Childhood Care and Learning (ECCE).

Another policy released by the RBI, 'National Strategy for Financial Education 2020-2025′ (NSFE), has suggested a multi-stakeholder-led approach for creating a financially aware and empowered India. The five Cs, outlined by the strategy paper, are: Content, Capacity, Community, Communication and Collaboration.

To achieve the vision of creating a financially aware and empowered India, NSFE has laid down strategic objectives, like inculcating financial literacy concepts among various sections of the population through financial education to make it an important life skill and encourage active savings behaviour.

Among other strategic objectives are encouraging participation in financial markets to meet financial goals and objectives, developing credit discipline and encourage availing credit from formal financial institutions as per requirement, and improving usage of digital financial services in a safe and secure manner.

The document stresses on the development of financial literacy content for school children (including curriculum and co-scholastic), teachers, young adults, women, new entrants at workplace/entrepreneurs (MSMEs), senior citizens, persons with disabilities, illiterate people. It also calls for development of a financial literacy mobile app and leverage social media.

National Digital Education Architecture (NDEAR)

NDEAR has been conceived by Government of India as a unifying national digital infrastructure to energise and catalyse the education ecosystem. It is federated, unbundled, interoperable, inclusive, accessible, evolving which aims to create and deliver diverse, relevant, contextual, innovative solutions that benefit students, teachers, parents, communities, administrators, and result in timely implementation of policy goals.

PM eVIDYA

To promote and further develop digital education in India, PM eVIDYA program was launched in 2020 to make e-learning more accessible to Indian students and teachers. The program will reportedly help 250 million students by bringing together all online and digital educational activities.

The program will also include creating original digital content for students who are blind or deaf as well as providing radio/podcasts and QR-coded digital textbooks to students in classes one through twelve via the DIKSHA portal.

This relaxed the regulatory environment for distance/open/online education, allowing the top 100 universities to start offering online courses, enhance learning opportunities for 37 million higher education students, and improve e-learning.

National Initiative for School Heads and Teachers' Holistic Advancement (NISHTHA)

To create modules for online education, NISHTHA was introduced at the secondary level. It is a capacity building programme for "Improving Quality of School Education through Integrated Teacher Training". It aims to build competencies among all the teachers and school principals at the elementary stage. The basic objective of this massive training programme is to motivate and equip teachers to encourage and foster critical thinking in students. .

National Knowledge Network

NKN was built as a high-capacity, low-latency network to connect all knowledge-creating organizations, including IITs, IIMs, universities, research institutes, and other e-government institutions, down to the district level. It was intended to promote cooperative learning and the creation of a comprehensive knowledge base.

15 Overview of tele-medicine industry in India

15.1 Telemedicine practices have slowly and steadily gained foothold in India

Telemedicine is a technology designed to increase accessibility of healthcare services from remote locations. Telemedicine makes extensive use of information technology to create a connection between doctors at the main hospital and patients at the remote / telemedicine centre. The doctor analyses the patient through telephonic conversation or video conferencing. She/he is assisted by a junior doctor or health worker who is physically present at the telemedicine centre. The junior doctors physically examine the patient and convey the information to the doctor. The doctor communicates diagnosis and medication based on the inputs provided by the junior doctors. If the ailment is complex, then the patient is advised to get admitted at the main hospitals to avail of intensive care. This model is useful in healthcare service provision at a time there is a dearth of healthcare professionals in the country

Telemedicine in India started with the inauguration of Apollo Aragonda Hospital in Andhra Pradesh in 2000. Since then, the Indian Space Research Organisation (ISRO), the Department of Information Technology, the MoHFW, state governments, and medical institutes in the public and corporate sectors have introduced several telemedicine projects that have showed a promising future for telemedicine, efficiently solving the problems of effective healthcare delivery in a vast country like India.

Telemedicine practices have slowly and steadily gained foothold in India. The spike in need for remote medical facilities has eventually resulted in mushrooming of telemedicine companies.

A Registered Medical Practitioner is entitled to provide telemedicine consultation to patients from any part of India. Multiple technologies can be used to deliver telemedicine consultation. There are 3 primary modes: Video, Audio, or Text (chat, messaging, email, fax etc.) Each one of these technology systems has their respective strengths, weaknesses, and contexts, in which, they may be appropriate or inadequate to deliver a proper diagnosis.

Strengths and limitations of each delivery platform

Mode	Strengths	Limitations
Video: **Telemedicine facility, apps, video on chat platforms, Facetime etc.**	• Closest to an in person-consult, real time interaction • Patient identification is easier • RMP can see the patient and discuss with the caregiver • Visual cues can be perceived • Inspection of patient can be carried out	• Is dependent on high quality internet connection at both ends, else will lead to a sub optimal exchange of information • Since there is a possibility of abuse/ misuse, ensuring privacy of patients in video consults is extremely important
Audio: **Phone, VOIP, Apps etc.**	• Convenient and fast • Unlimited reach • Suitable for urgent cases • No separate infrastructure required • Privacy ensured • Real-time interaction.	• Non-verbal cues may be missed • Not suitable for conditions that require a visual inspection (e.g., skin, eye, or tongue examination), or physical touch • Patient identification needs to be clearer, greater chance of imposters representing the real patient
Text based: **Specialized chat-based telemedicine smartphone apps, SMS, websites, messaging systems e.g., WhatsApp,**	• Convenient and quick • Documentation & Identification may be an integral feature of the platform	• Besides the visual and physical touch, text-based interactions also miss the verbal cues

Google Hangouts, Facebook Messenger	• Suitable for urgent cases, or follow-ups, second opinions provided RMP has enough context from other sources, • No separate infrastructure required, • Can be real time	• Difficult to establish rapport with the patient. • Cannot be sure of identity of the doctor or the patient
Asynchronous: Email, fax, recordings, etc.	• Convenient and easy to document • No specific app or download requirement • Images, data, reports readily shared • No separate infrastructure required • More useful when accompanied with test reports and follow up and second opinions	• Not a real time interaction, so just one-way context is available, relying solely on the articulation by the patient • Patient identification is document based only and difficult to confirm • Non-verbal cues are missed • There may be delays because the Doctor may not see the mail immediately

Source: CRISIL MI&A Research

National level e-governance healthcare initiatives

Ministry of Health & Family Welfare is promoting eHealth or Digital Health i.e., use of Information & Communication Technology initiatives in the direction of "reaching services to citizens" and "citizen empowerment through information dissemination" to bring about significant improvements in the public healthcare delivery. To promote tele-medicine facilities, the key initiatives taken by the government are listed below:

Online consultation - Telemedicine	
National Medical College Network (NMCN)	NMCN is being established to link all the medical colleges of the nation for the purpose of establishing e-classrooms, providing tele education, Continuous Medical Education (CME) and building capacities (MoHFW, GoI, 2019)
National Telemedicine Network (NTN)	NTN is being established across the nation connecting health facilities in rural areas (SC, PHC, CHC) with the district hospitals and medical college for providing telemedicine services (MoHFW, GoI, 2019)
SATCOM based telemedicine nodes	Telemedicine nodes are being established at the pilgrimage places for the purpose of providing speciality consultation, screening of diseases, and providing preventive care to the devotees (MoHFW, GoI, 2019)

Source: CRISIL MI&A Research

15.2 Growth drivers

Accelerating implementation of innovative digital technologies

Being at the forefront of technological innovations, healthcare is witnessing introduction of a variety of cutting-edge technologies that continue to improve care and change the way care is delivered. The COVID-19 pandemic favoured the rapid adoption of digital solutions and advanced technology tools in healthcare. Among these tools, telemedicine emerged as an indispensable resource to improve the surveillance of patients, curb the spread of disease, facilitate timely identification and management of ill people, and to ensure the continuity of care of frail patients with multiple chronic diseases.

Since the crisis put public services under stress, governments were urged to deploy effective digital technologies. AI-powered technology supported healthcare services when emergency lines outpaced capacity. Many people have turned to self-checks for symptoms and accessed virtual doctors through telemedicine to get medical advice.

Multilingual chatbots offered solutions in overcoming language barriers, accessing information, and communicating with health practitioners. The pandemic forced governments and societies to turn toward digital technologies to respond to the crisis in the short term, resolve socio-economic repercussions in the mid-term and reinvent existing policies and tools in the long term.

Betterment in digital connectivity aiding adoption of tele-medicine services

Connectivity, now more than ever, is emerging as a crucial technology for the healthcare industry, providing equitable care to all who need or depend on it. Telemedicine coupled with enhanced connectivity increases the value of virtual interaction by allowing for higher resolution video and images. Improved telemedicine services allow patients to video chat with physicians from their homes, it provides a platform for healthcare professionals for more efficacious digital data management systems.

Internet-connected ambulances are another feature that helps connect patients, ambulance staff, and remote medical professionals in real time. In addition to potentially transforming healthcare, connected ambulances enable doctors to identify vital signs, easily access medical records virtually, and ultimately respond much faster leading to better results.

With a high-speed network connectivity, medical personnel can reliably share large data files consisting of medical imagery. This can improve access as well as the quality of care.

Increasing adoption for self-care devices/solutions

Wearable devices have become a critical component of effective healthcare delivery. Internet-enabled wearable devices fitted with sensors, smartphone compatibility and built-in GPS help healthcare professionals monitor pulse/heart rate, SpO2 (blood oxygen), skin temperature, stress, and ECG in real-time. Apart from facilitating better patient care, such a preventive approach forms a critical part of the population health approach in the country, aiding in the detection and prevention of serious chronic diseases.

Tele-consultation in healthcare proves to be time and cost-effective solution

Lack of access to healthcare in remote geographic areas is one of the major drivers for tele-medicine adoption. Typically, patients from rural areas travel to urban areas for treatment or diagnosis of a specific disease. Patients are unlikely to travel from rural to urban areas for routine care services, and tele-medicine is an effective solution to overcome these barriers in care. In addition, adoption of tele-medicine systems by various healthcare providers significantly reduces the time and money spent by patients. Rapid advancements in technology are expected to further boost the demand for online consultation, thereby contributing to increasing penetration of tele-medicine solutions and services.

15.3 Future prospects of tele-medicine in India

Increasing population and the decreasing number of healthcare workers have emphasised the need for telemedicine. In the wake of the ongoing pandemic, telemedicine proves to be a boon providing added benefits to healthcare providers and patients.

While telemedicine cannot replace traditional medical consultations and hospital visits for emergency conditions and medical procedures, it can certainly reduce the pressure on the healthcare system in a vast and populous country like India with

Practo gets more than 300 million patients every year as per its website accessed on December 28, 2022. In 2020, Practo tele-consultations jumped by 3x, and during lockdown, the peak demand was 10x.
Till November 23, 2022, the Health Ministry's eSanjeevani telemedicine service had crossed 76 million patients served since its launch.
Source: Company website

disproportionate healthcare facilities. Hence, the government needs to drive awareness about telemedicine and ensure robust security around patient privacy and their health data. Telemedicine, which is only one component of the much diverse digital health plan, will have a crucial role to play in the success of the NDHM.

Telemedicine will continue to grow and be adopted by more healthcare practitioners and patients in a wide variety of forms and will be a key enabler in fostering its growth. In March 2020, the Ministry of Health and Family Welfare, India, had released the "Telemedicine Practice Guidelines". The purpose of these guidelines is to give practical advice to doctors so that all services and models of care used by doctors and health workers are encouraged to consider the use of telemedicine as part of their regular practice. These guidelines will assist medical practitioners in pursuing a sound course of action to provide effective and safe medical care founded on current information, available resources and patient needs to ensure patient and provider safety.

Telemedicine healthcare is expected to reach interiors of rural India and provide health access to remotely located areas. Telemedicine helps bring the facilities and medical professionals to remote locations with the help of healthcare centres. Telemedicine is expected to reduce unnecessary hospital visits and spending cost of patients by bringing healthcare facilities close to their homes at an affordable cost. To achieve this, investment and innovation are required across all segments of healthcare, such as medical equipment, IT infrastructure, telecom and diagnostic services.

However, telemedicine cannot be the answer to all problems and surely cannot replace in-person consultation or emergency medicine. However, it can immensely help cope with the current pandemic. Furthermore, its wider acceptance and implementation will help us prepare better for any future pandemics.

15.4 Key players operating in Indian tele-medicine market

Key players in the market

Company	Details	Practice management	Clinical automation	Telemedicine
Practo	Offers an online software platform that provides automated appointment scheduling, billing solutions and storage of medical records	**Yes** **Insta by Practo** **Ray**		**Pipeline**
KareXpert	Provides services such as advanced Hospital Information Management System, Electronic Health Records, Radiology Information System/Picture Archiving and Communication System, pharmacy, telemedicine, medical IoT, advanced BI, connected ambulance, etc.		**Yes**	**Yes**
DocEngage	An industry leading EHR co-created with feedback from over 1,000 medical professionals	**Yes**		**Yes**

Adroit Infosystems	Provides eHospital Systems –a customisable, comprehensive and integrated hospital management system designed to manage all hospital operations	**Yes**	**Yes**	**Yes**
DreamSoft4u	One of the leading custom healthcare software development companies in India, offering healthcare IT services by combining cutting-edge technologies with its strategic expertise	**Yes**		**Yes**

Most of the companies are present in multiple spheres of the sub-segments and try to provide software solutions across the healthcare segment. Many of them are now venturing into telemedicine and e-consultation due to the ongoing pandemic, which provides huge opportunities. Telemedicine, artificial intelligence (AI), mobile and wearable devices, and robotic operations are the key segments with huge growth potential.

There are many players in the market, but penetration is low, providing opportunities to new investors. Though companies such as Practo have the first-mover advantage in India, there are at least 140 start-ups in the doctor discovery, appointment booking and practice management service segment, according to industry source, a start-up tracker. 1 mg, an online pharmacy and digital health care platform has over 260 million customer visits and over 31 million ordered delivered from its platform. It also facilitates patients to buy medicines and make bookings for lab tests or doctor consultations. Some of the established businesses in the practice management segment are Lybrate, Ziffi, Qikwell and HelpingDoc.

As per industry estimates, there are 5,000+ start-ups in India that focus on healthtech. Some of the prominent ones are PharmEasy, CureFit, Practo, MedLife and CallHealth. The focus of most start-ups is to help provide access to healthcare resources.

Some start-up healthtech portals also allow digitisation of health records, which helps in improving the accuracy of diagnosis, building patient longitudinal history, reducing medical administration errors, and offering timely warnings, alerts to prevent severe medical crises. Understanding the need for IoT devices and their impact, tech giants such as Google, Apple, Samsung, and others are also pushing a whole new gamut of digital health applications for monitoring heart rate, blood oxygenation, blood pressure, pulse rate, blood sugar level, etc. Several healthcare organisations and doctors are also embracing the use of AI in adding value to the quality of care delivered to their patients. The tools integrated with AI help transform the healthcare delivery model by automating the everyday processes in the sector and providing improved patient outcomes.

A few noteworthy examples of the successfully established telemedicine services in India include mammography at Sir Ganga Ram Hospital, Delhi; oncology at Regional Cancer Centre, Trivandrum; and surgical services at Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow. The private sector has also shown a keen interest in the field. Some of the major Indian private players in telemedicine include Narayana Hrudayalaya, Apollo Telemedicine Enterprises, Asia Heart Foundation, Escorts Heart Institute, Amrita Institute of Medical Sciences and Aravind Eye Care. They function with support from central and state governments, and from organisations such as

ISRO, which guide them with respect to appropriate and updated technologies. Some of the established players in telemedicine include TiaTech, Teladoc, Vivadox and eHealthFlex.

The top established players for software in clinical automation include PerkinElmer, IBM and OSP Labs.

Adopting technologies that strengthen the healthcare delivery channels is now the prime focus of government, something that health-tech start-ups have pioneered flawlessly. Technology helps caregivers and medical professions formulate a more targeted patient care plan, thereby improving the overall health and wellness ecosystem. The role of technology augments access, delivery, and outreach of services crucial to human existence.

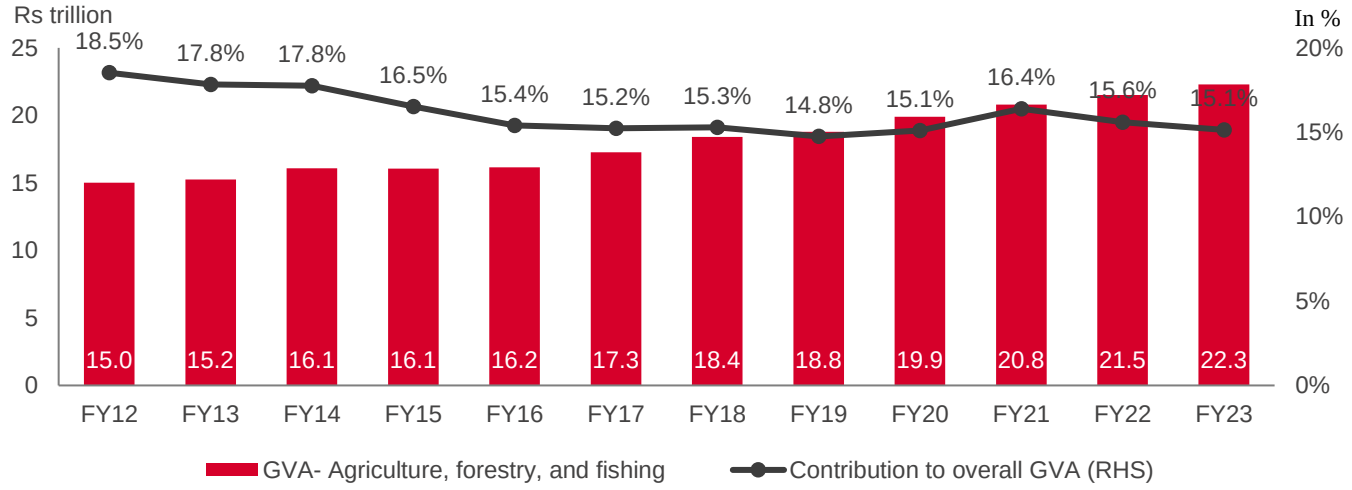
16 Overview of tele-agriculture industry in India

16.1 Overview of agriculture sector

Agriculture plays a vital role in the Indian economy. The sector plays a significant role in rural livelihoods, employment, and national food security. It contributes around one-sixth of the gross domestic product (GDP) and provides employment to over 40% of the total workforce. It is also an important part of internal and external trade, positioning India as a significant agricultural exporter, with the sector contributing over 10% to India's exports. Indian agriculture broadly comprises farming (crops and horticulture) and forestry, livestock (milk, eggs, meat) and fisheries. The sector also impacts non-agricultural segments, such as consumer products, retail, chemicals and e-commerce, which are dependent on agricultural cash crops for raw material (tea, coffee, cotton, jute, sugarcane, oilseeds).

The agribusiness ecosystem comprises the business activities performed from farm to fork, covering the entire value chain, from the supply of agricultural inputs, the production and transformation of agricultural products, and their distribution to final consumers. Indian agribusiness remains largely unorganised and unstructured, with the presence of multiple levels of intermediaries and middlemen across the agriculture value chain. The production part of the value chain remains highly fragmented and unorganised, with small and marginal farmers as the primary providers of food and nutrition to the country

Agriculture gross value added (GVA) (at constant 2011-12 prices) and GVA contribution



Note: RE: Revised estimate, PE: Provisional estimate
Source: MOSPI, CRISIL MI&A

16.2 Issues related with agriculture and importance of tele-agriculture in efficiently resolving them

Agriculture has been the oldest and the most labour -intensive profession. It has become more vulnerable to disruptions like the COVID-19 pandemic. Viewed from the socio-economic point, agriculture is the most important sector that needs focus and attention at all levels. The Government of India's call to reach its goal of doubling the income of farmers (DFI) by 2022 has, to some extent, underscored the need to explore all means to increase agricultural productivity and farmers' profitability. Issues affecting the agricultural sector include ensuring the availability of timely inputs, increasing focus on measures to improve productivity- especially of small and marginal farms, adoption of modern agricultural practices, optimal use of inputs, choice of the right crops through macro and

micro-level planning, availability of near real-time information on prices and markets, enhanced efficiencies in the post-harvest operations like storage, logistics and food processing, affording the farmer a greater role and share in the value chain, diversification, and above all, addressing the issues relating to information asymmetry across the entire agricultural cycle.

Digital technologies are transforming all the sectors of the economy and the society in innumerable ways. Communications, banking, payments, travel, energy, healthcare, taxation, and governance have significantly benefited by deploying digital solutions. The emphasis of the need for the agriculture and allied sectors to embrace digital technologies cannot be ignored.

Many farmers do not have any authentic source for updated information regarding extreme climate occurrence such as droughts, storms, floods, and other natural calamities.

Traditionally, the dissemination of agricultural information in developing countries has been facilitated through public advisory services, in which advisors visit individual farmers and farmer groups to provide information. This traditional method of disseminating information has two major drawbacks. Firstly, private visits can only visit a very limited number of farmers due to the high transaction costs. Second, the information provided through this channel is often generic and not always well suited to the specific needs and circumstances of farmers. The use of digital approaches and technology has the potential to improve the effectiveness of agricultural advisory services by reducing transaction costs and improving the quality of information provided.

Digital agriculture extension employs digital tools and services that are used to deliver information effectively. Short message service (SMS), interactive voice response (IVR), interactive radio, and low-cost video typically allow advisory workers to contact large numbers of farmers in a short period of time to provide advisory services such as timely reminders. used to provide and warnings, weather forecasting best practices to help farmers be more productive. With the help of digital technology, the scope of expansion can be increased.

It is necessary to provide the correct information to make an informed decision and realise their full potential. At every stage of the cropping cycle, the information provider must be well connected with the farmers. Thus, digital technologies enable the creation of farmers' networks and keep connected with the service/ advisory providers. Digital extension services are helpful for the following reasons:

- They can be adapted to the local context
- Demand-driven and farmer-led
- Market-oriented,
- Pluralistic (involve multiple actors)
- Accountable
- Sustainable
- Scalable

16.3 Government initiatives and drivers

Digital agriculture division

With the aim of improving awareness, knowledge and efficiency of farmers, Ministry of Agriculture & Farmers Welfare and keeping in view of the overall goal of increasing farmers' incomes and following the recommendations of the

Doubling of Farmers Income (DFI) committee, the Digital Agriculture Division has been created by reorienting the erstwhile Information Technology Division.

The National e-Governance Plan in Agriculture (NeGPA) has been modified to include new & emerging technologies in the field of Digital Agriculture

National e-Governance Plan in Agriculture (NeGPA)

National e-Governance Plan in Agriculture (NeGPA) was initially launched in seven selected states namely, Assam, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, and Maharashtra, in the last quarter of 2010-11. This scheme has subsequently extended in 2nd Phase to cover all the states and 2 UTs from 2014-15. NeGPA aims to achieve rapid development in India through use of Information & Communication Technology (ICT) for timely access to agriculture related information for the farmers.

During Phase I of the scheme, the hardware was centrally procured and distributed to all the 7 pilot states. Under NeGPA (Phase II), funds were being released to states till 2019-20 for preparation of sites, training sites, procurement of hardware, state project monitoring units, data digitization, connectivity up to block level, dissemination of agriculture related information through ICT means. Under the scheme, funding pattern between the centre and the state is 90:10 for North-Eastern states and Himalayan states, 60:40 for other States and 100:0 for union territories.

As a part of NeGPA initiative, the Department has developed one-stop window-farmers portal (www.farmer.gov.in) for dissemination of information on various agricultural related matter including, seeds variety, storage warehouse, pests and plant diseases, best agricultural practices, watershed, mandi details etc.

The Department has also developed and made functional SMS/mKisan portal (www.mkisan.gov.in) for sending advisories on various crop related matters to the registered farmers through SMSs. In mKisan more than 5 crores farmers are registered for receiving crop advisories through SMS.

Various mobile applications including Kisan Suvidha have also been developed to facilitate dissemination of information to farmers on the critical parameters viz., weather, market prices, plant protection, agro-advisory, extreme weather alerts, Input sealers (of seed, pesticide, fertilizer, farm machinery), soil health card, cold storage & warehouses, soil testing laboratories and veterinary centre & diagnostic labs, crop insurance premium calculator and the government schemes. This app was launched in 2016, has more than 1.3 million downloads.

The Division is also engaged in creating a federated farmers database by compiling information of the farmers from various databases available with the Government and linking them with land records. The division is in the process of entering into memorandum of understanding (MoU) with various leading agriculture/technology/other players in the country for developing proof of concepts (PoCs) on the farmers database.

India Digital Ecosystem of Agriculture (IDEA)

The Government of India came up India Digital Ecosystem of Agriculture (IDEA) framework that lays down the architecture for the federated farmers' database (Agristack) that is being built by taking the publicly available data as already existing in various schemes and linking them with the digitized land records. The vision of IDEA is, "To build a National Digital Agriculture Ecosystem, to elevate Indian Agriculture Sector to higher levels of efficiency and productivity, and to improve the welfare and income of farmers". The IDEA framework would be the foundation to build innovative agri-focused solutions leveraging emerging technologies to contribute effectively to creating a better Ecosystem for Agriculture in India. This Ecosystem shall help the Government in effective planning towards increasing the income of farmers in particular and improving the efficiency of the agriculture sector as a whole.

MoU of Jio with Ministry of Agriculture

Jio, which is a large Indian telecom service provider, is also into the business of providing IT and digital services. In the MoU with the Ministry of Agriculture, Jio has proposed to build/enhance features of 'JioKrishi' (Jio Agri) platform which aims to cater to the following agricultural functions and services:

- Enable creation of a data-driven ecosystem for the farmer and farm activities
- Soil testing and analytics of the soil parameters of farmers' lands as well as irrigation needs of farmers
- Provision agro advisory to farmers using multimedia like videos etc.
- Facilitate farmers' access to agricultural specialists to answer their queries directly

Jio Agri Platform is built with the purpose of digitizing agri ecosystem across the value chain to empower the farmers. It is designed to bring major participants of the Agri value chain on a common integrated platform and drive efficiencies in all agricultural activities and transactions, be it 'in the farm', 'around the farm', or 'beyond the farm'.

The digital agriculture division also is in-charge of an attached office – Mahalanobis National Crop Forecast Centre (MNCFC). MNCFC was established, initially, to provide in-season crop forecasts and assessment of drought situation using state of the art techniques and methodologies developed by Indian Space Research Organization (ISRO). Over the years, its scope of work has expanded, and it is now involved in various activities of the department.

Apart from the above, a comprehensive Information and Communication Technology (ICT) strategy has been developed not only to reach out to farmers in an easy and better way but also for planning and monitoring of schemes so that policy decisions can be taken at a faster pace and farmers can be benefited quickly. To empower different sections of rural areas, different ICT strategies have been devised:

- Those who have access to digital infrastructure can get the information through websites/web portals.
- Those who have smart phones can access the same information through mobile apps.
- Those who have basic phones, can get this information through SMS advisories sent by experts.
- To get the personalized information; farmers can call at the toll-free number of Kisan Call Centre – 18001801551.

Launch of digital platform- Kisan Sarathi

To facilitate farmers to get 'right information at right time' in their desired language, a digital platform namely 'KisanSarathi' was launched jointly by ministry of Agriculture and Farmers Welfare and ministry of Electronics and Information Technology, on 16th July 2021 on the occasion of 93rd Indian Council of Agriculture Research (ICAR) Foundation Day.

The aim behind launching the digital platform is to empower farmers with the technological interventions to reach farmers in remote areas. With the help of the digital platform, the farmers can interact and avail personalised advisories on agriculture and allied areas directly from the respective scientists of KrishiVigyan Kendra (KVKs). Kisan Sarathi initiative aims to addressing the location specific information needs of the farmers.

Kisan Call Centres (KCC)

In order to harness the potential of ICT in Agriculture, Ministry of Agriculture & Farmers Welfare launched the scheme "Kisan Call Centres (KCCs)" on January 21, 2004. Main aim of the project is to answer farmers' queries on a

telephone call in their own dialect. The KCCs are managed by a Service Provider i.e. IFFCO Kisan Sanchar Limited (IKSL). In Kisan Call Center farmers can seek assistance on any type of crops related query, some of the queries are as follows:

- Disease related query in crops.
- Pest control in crops.
- Plant pathology.
- Soil Science.
- Animal Husbandry.
- Advanced farming practices.
- Organic Farming.
- Information on High Yield Variety Seeds.
- Market Information.
- Support Programmes for Farmers etc.

At present these call centres are working in 21 different locations covering all the states and union territories. A countrywide common eleven-digit toll free number 1800-180-1551 or 1551 has been allotted for Kisan Call Centres. This number is accessible through mobile phones and landlines of all telecom networks including private service providers. Replies to the farmers' queries are given in 22 local languages.

Kisan Call Centre services are available from 6.00 am to 10.00 pm on all seven days of the week at each KCC location. Kisan Call Centre agents known as Farm Tele Advisors (FTAs), are graduates or above (i.e., post-graduate or Doctorate) in agriculture or allied areas (Horticulture, Animal Husbandry, Fisheries, Poultry, Beekeeping, Sericulture, Aquaculture, Agricultural Engineering, Agricultural marketing, Biotechnology, Home Science etc.).

Queries which cannot be answered by Farm Tele Advisor (FTAs) are transferred to higher level experts in a call conferencing mode. These experts are subject matter specialists of state agriculture departments, ICAR and state agricultural universities.

A Kisan Knowledge Management System (KKMS) to facilitate correct, consistent and quick replies to the queries of farmers and capture all the details of their calls, has been developed. KKMS has its independent web site, the KCC agents working at various KCC locations throughout the country have access to this web site through their specific credentials.

DD Kisan

DD Kisan is an Indian agriculture 24-hour television channel, which is owned by Doordarshan and was launched on 26 May 2015. The channel is dedicated to agriculture and related sectors, which disseminates real-time inputs to farmers on new farming techniques, water conservation and organic farming among other information.

To disseminate technical information regarding agriculture, DD Kisan has partnered with scientific bodies such as the ICAR and the India Meteorological Department. The channel's television programs feature information about farmers, share best agricultural practices in various regions of the country, and include real-time interactions with experts and agricultural scientists. The channel features shows such as Hello Kisan, a live telecast which allows farmers to speak with agriculture experts. A show called Mandi Khabar gives market news about wholesale crop prices, and on arrivals and demand for agricultural products at markets. Mausam Khabar provides weather updates,

and advice customised for different agro-climatic regions/areas of the country. Farmers are informed about the rainfall and necessary action to be taken in their fields during sowing.

MoU between Digital India Corporation and Indian Council of Agricultural Research

To provide location specific farm tele advisories, the Indian Council of Agricultural Research (ICAR), Ministry of Agriculture and Farmers Welfare and Digital India Corporation (DIC), Ministry of Electronics & Information Technology signed an MoU in June 2021.

The objective of the MoU is to integrate the existing Interactive Information Dissemination System (IIDS) platform of DIC with the proposed KisanSarathi programme of ICAR and its implementation through ICAR network to reach a large number of farmers across the country. The MoU intends to facilitate farmers by providing location specific `Demand Based Tele Agriculture Advisories'.

DIC and ICAR have agreed to work together to develop and deploy an ICT platform to build and operate a multi-media, multi-way advisory and communication system to support various agricultural activities at the local level. To start with, IIDS would be deployed at ICAR which is a push-and pull-based system wherein agriculture-related information can be pulled from the farmers using mobile phones. IIDS offers farmers an option to receive information based on their individual needs for which they have subscribed. Back-end experts will have access to the farmers' database while responding to their queries. In this manner, experts would be able to understand the problems raised by farmers or field problems in a better way and expeditiously provide appropriate solutions to the farmer in a personalized manner. The IIDS platform is planned to be made to use all over the country with this MoU with ICAR. DIC will be providing the entire technical solution with support for development, hosting and managing the requisite ICT platform. On the other hand, ICAR will be managing and monitoring the entire operations through their extension services network in the form of Krishi Vigyan Kendras (KVKs), various domain specific research institutes and network of agricultural universities etc, in a phased manner.

17 Assessment of travel industry in India

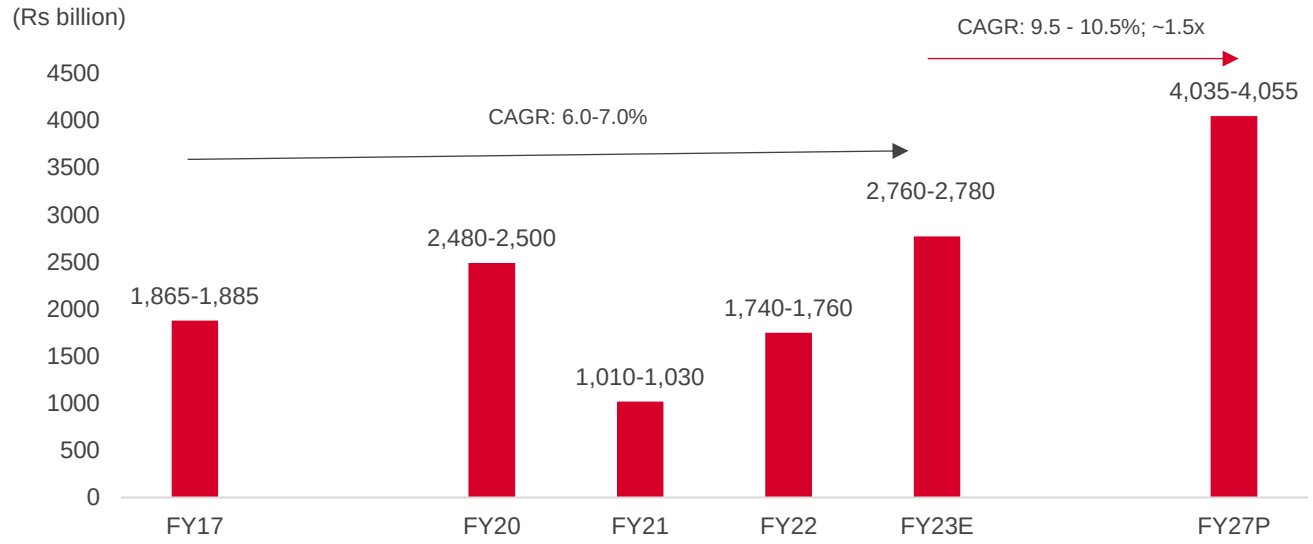
17.1 Overview of the travel market in India

Indian travel industry expected to clock 9.5-10.5% CAGR between fiscals 2023 and 2027

CRISIL MI&A Research has considered airline ticketing (domestic and international), hotels (room revenues across premium, mid-market and budget accommodations), and railway ticketing (long distance train ticketing) segments for mapping the travel industry in India. The market sizing includes tickets booked via offline and online modes and is estimated at the gross booking level (defined as the total amount paid by customers for travel services and products booked through the company and/or agency, including taxes, fees and other charges; and these are net of cancellations, discounts and/or refunds).

The Indian travel industry was estimated at Rs 1,865-1,885 billion in fiscal 2017. Led by the country's growing economy, geographic and cultural diversity, and various government initiatives, the industry grew at a CAGR of 6.0-7.0% from fiscal 2017 to 2023 expanding to Rs 2,760-2,780 in fiscal 2023. The travel industry is expected to be driven by the development of tourism infrastructure, increase in connectivity across means of transport, rising income translating to higher discretionary spending on travel and tourism, reforms in visa and passport allowing easier access to India (in case of foreign tourist arrivals) and other countries (in case of Indian passport holders), and frequency of travel for business and leisure purposes. In fiscal 2027, the industry is expected to become 1.5 times its size in fiscal 2023, by growing at a CAGR of 9.5-10.5% between fiscals 2023 and 2027.

Indian travel industry – trends and outlook



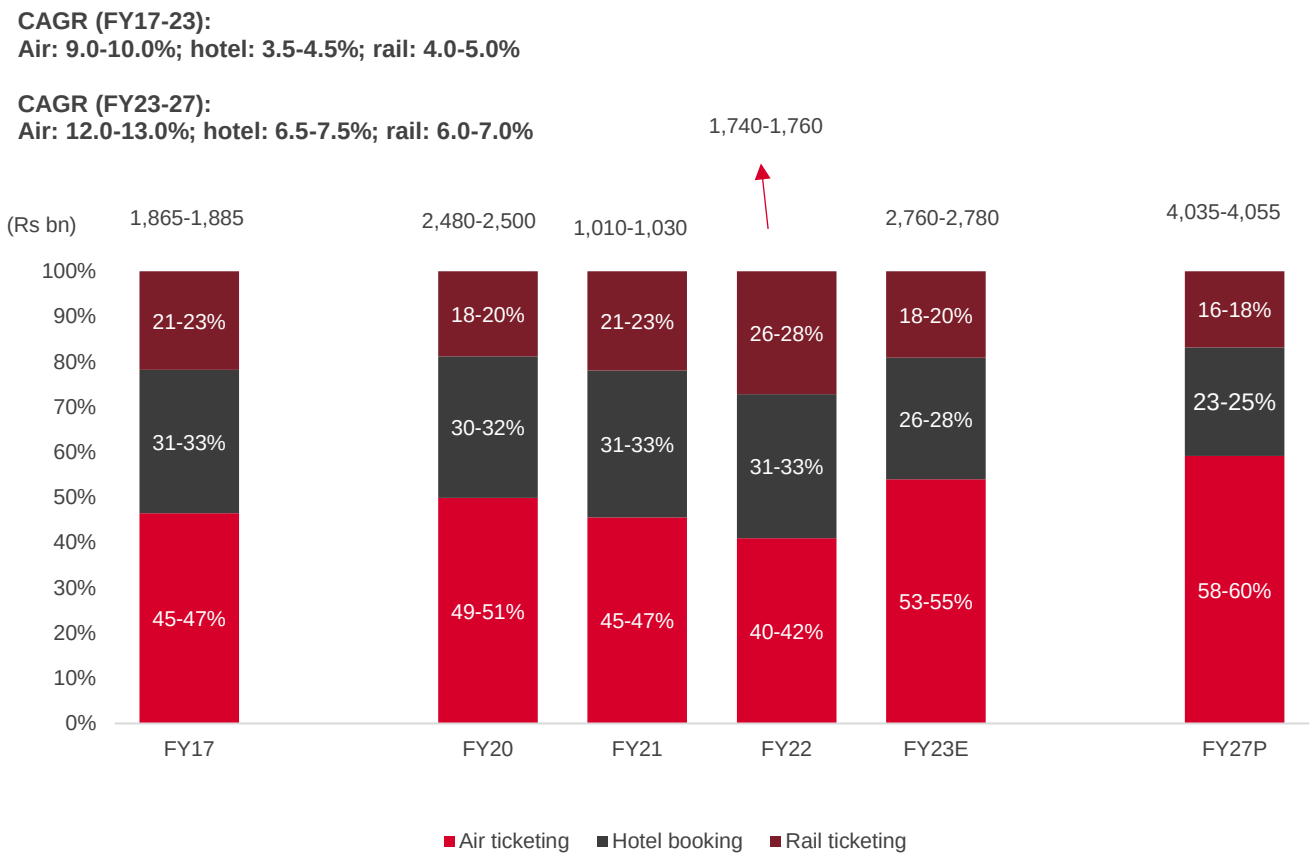
Note: P: projected; market sizing for the Indian travel industry has been estimated at gross bookings. The Indian travel industry size does not include bus bookings, as the bus booking industry is largely unorganised. Market sizing estimates post considering COVID-19 impact.
Source: CRISIL MI&A Research

Air travel to retain majority share in Indian travel market as of fiscal 2027

The air ticketing segment, which logged a CAGR of 9-10% between fiscals 2017 and 2023, enjoys 53-55% share of the Indian travel market as of fiscal 2023. The growth momentum is expected to continue till fiscal 2027 at 12-13% CAGR, led by the growing airport infrastructure and sustained growth outlook of the travel industry. Air ticketing is expected to continue to dominate the Indian travel market as of fiscal 2027. With 26-28% share as of fiscal 2023, the

hotel segment is the second highest contributor. CRISIL MI&A Research expects its share to fall to 24-26% by fiscal 2027, with the segment charting annual growth of 6.5-7.5% between fiscals 2023 and 2027. The railways segment is expected to post CAGR 6-7% between fiscals 2023 and 2027.

Segment-wise share in the Indian travel market



Note: E: estimated P: projected

The Indian travel industry size does not include bus bookings, as total bus booking industry is largely unorganised. Market sizing are estimates post considering COVID-19 impact.

The numbers above the bar charts represent total Indian travel market for that year

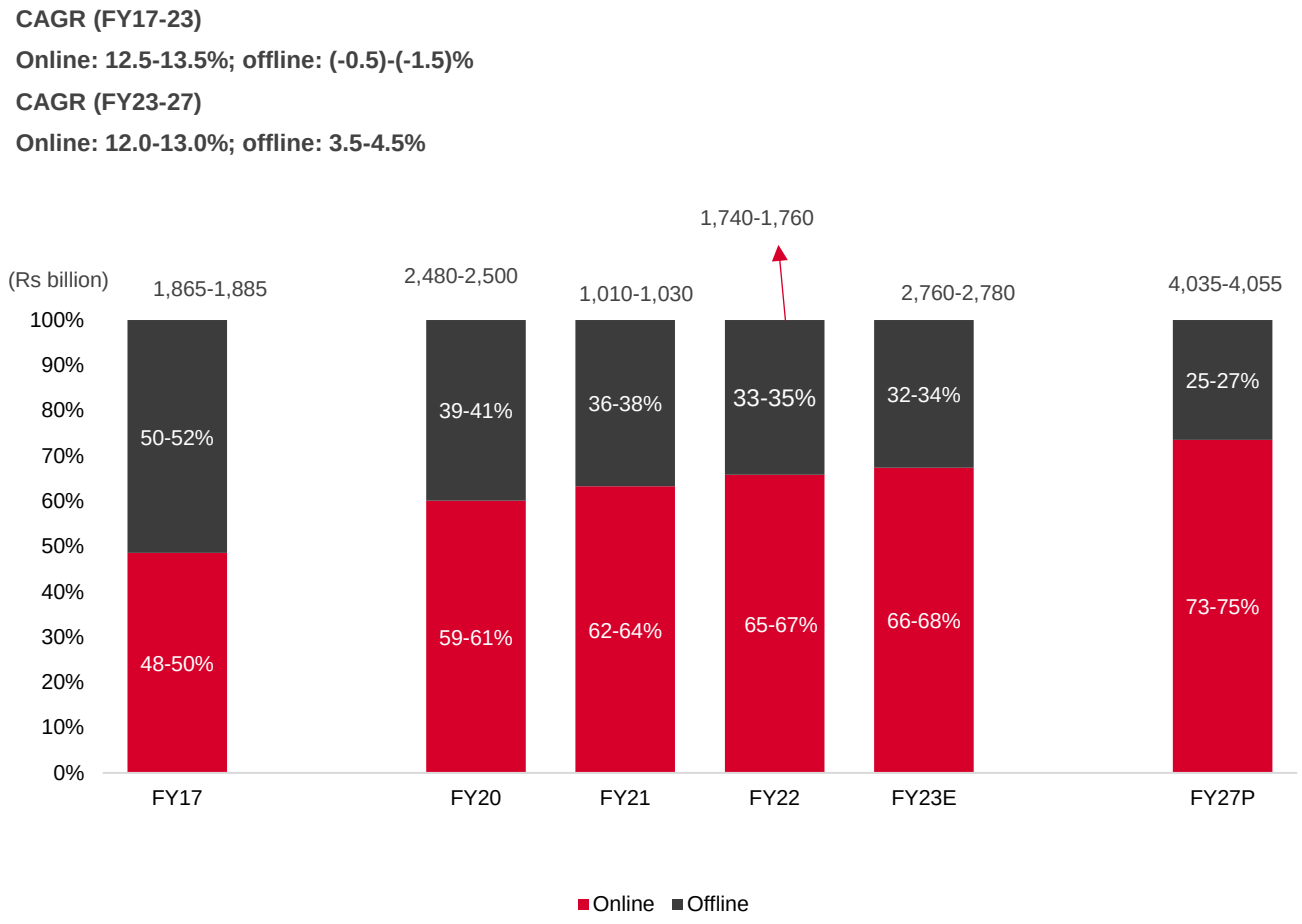
Source: CRISIL MI&A Research

Online penetration in the Indian travel market to reach 73-75% by fiscal 2027

The Indian travel market is growing fast and has significantly evolved with digitisation. The global distribution system (GDS)* was introduced for travel and hospitality service providers in India during the 1990s, at a time when internet penetration was low. The trend in online travel bookings was further fuelled with the Indian Railway Catering and Tourism Corporation (IRCTC) launching its e-ticketing services in 2002. Another driver of online ticketing was the emergence of OTAs and online travel aggregators during the early 2000s, who initially focussed on airline ticketing.

Ticketing services across travel segments have undergone a dramatic change thanks to increased internet penetration, greater affordability of smart phones, user friendliness of online platforms, convenience in terms of comparison, varied modes of payment offered (credit cards, debit cards and net banking), and faster pace of service providers adopting digital platforms for their respective businesses. Online penetration, defined as share of bookings done online via captive websites of the service providers or through OTAs, of the Indian travel industry stands at 66-68% as of fiscal 2023. It is expected to increase to 73-75% by fiscal 2027, supported by growth in online transactions.

Trend and outlook in online penetration of the Indian travel market



Note: P: projected

The Indian travel industry size does not include bus bookings, as total bus booking industry is largely unorganised. Market sizing are estimates post considering COVID-19 impact. The numbers above the bar charts represent total Indian travel market for that year.

Source: CRISIL MI&A Research

17.2 Review of the online ticketing market in India

Indian online ticketing market to log 12-13% CAGR between fiscals 2023 and 2027

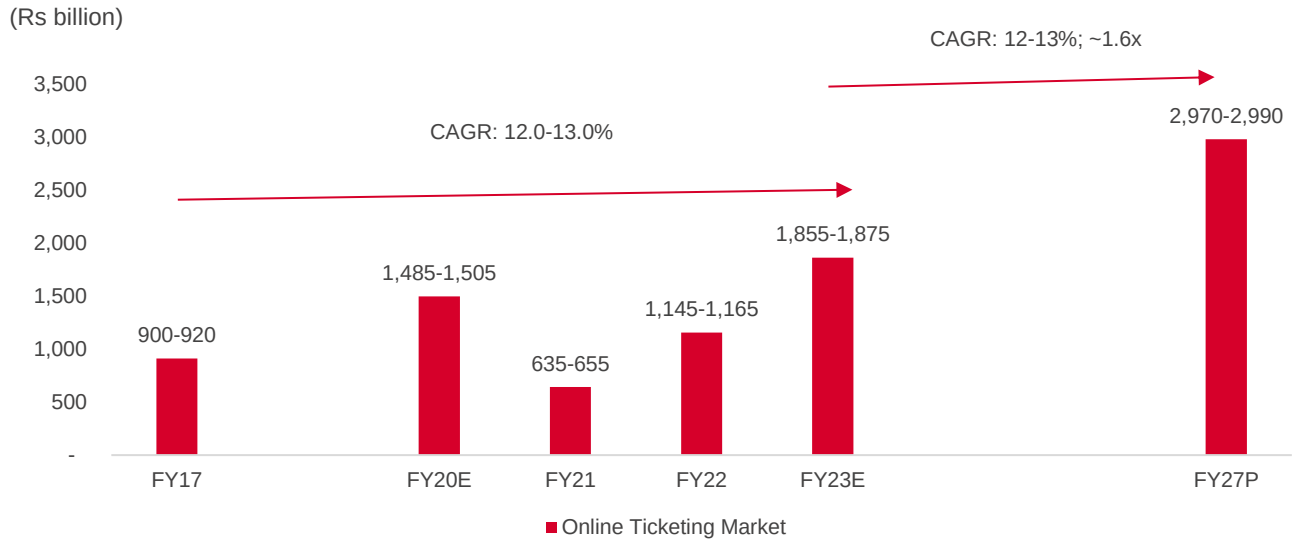
Online bookings are typically done over the internet on laptops, desktops, tablets, and mobiles. Offline bookings include bookings made through phone calls, and walk-ins. The industry size has been estimated at gross bookings defined as the total amount paid by customers for travel services and products booked through the company and/or agency, including taxes, fees and other charges; and these are net of cancellations, discounts and/or refunds. CRISIL MI&A Research has also considered online bookings for the bus segment for the purpose of this market sizing.

While online ticketing of movies, sports and other events is also widely popular, these have been excluded from the purview of this study as the focus is on travel-related segments. Tour or holiday packages have also been excluded from the market sizing in order to avoid over-estimation.

In fiscal 2023, the Indian online ticketing market is estimated to be worth Rs 1,855-1,875 billion, registering 12.0-13.0% CAGR from Rs 900-920 billion in fiscal 2017. Growth can be attributed to the increasing penetration of internet

and smart phones. Other enabling factors include growing share of low-cost airlines, increasing popularity of online railway ticket booking system, and convenience that online bookings offer. However, the online ticketing industry is not without its share of challenges. Travellers' concern about security of their personal information and online financial frauds are the key challenges that require to be addressed effectively in order to ensure seamless transition from offline to online channels. The industry from its size in fiscal 2023 (Rs 1,855 billion - 1,875 billion) is expected to grow to 1.6 times (Rs 2,970 billion - 2,990 billion) by fiscal 2027, at a CAGR of 12-13%.

Online ticketing industry in India – trend and outlook



Note: E: estimated P: projected. The online ticketing industry includes bus booking revenues along with flight, rail and hotel bookings.

Source: CRISIL MI&A Research

Sub-segments within the online ticketing market

Airline ticketing has a dominant share in the Indian online ticketing industry

The online ticketing market in India is dominated by high-volume airline ticketing, including domestic and international travel. The segment accounts for 59-61% of online ticketing. Industry estimates indicate airlines have a high online penetration of 74-76% as these were the first to adopt the online channel. Going forward, online air ticketing is expected to grow further as more travelers (retail as well as corporate) migrate from offline to online platforms. Consequently, air ticketing is expected to maintain its dominance in the online ticketing market in India, with 64-66% share by fiscal 2027.

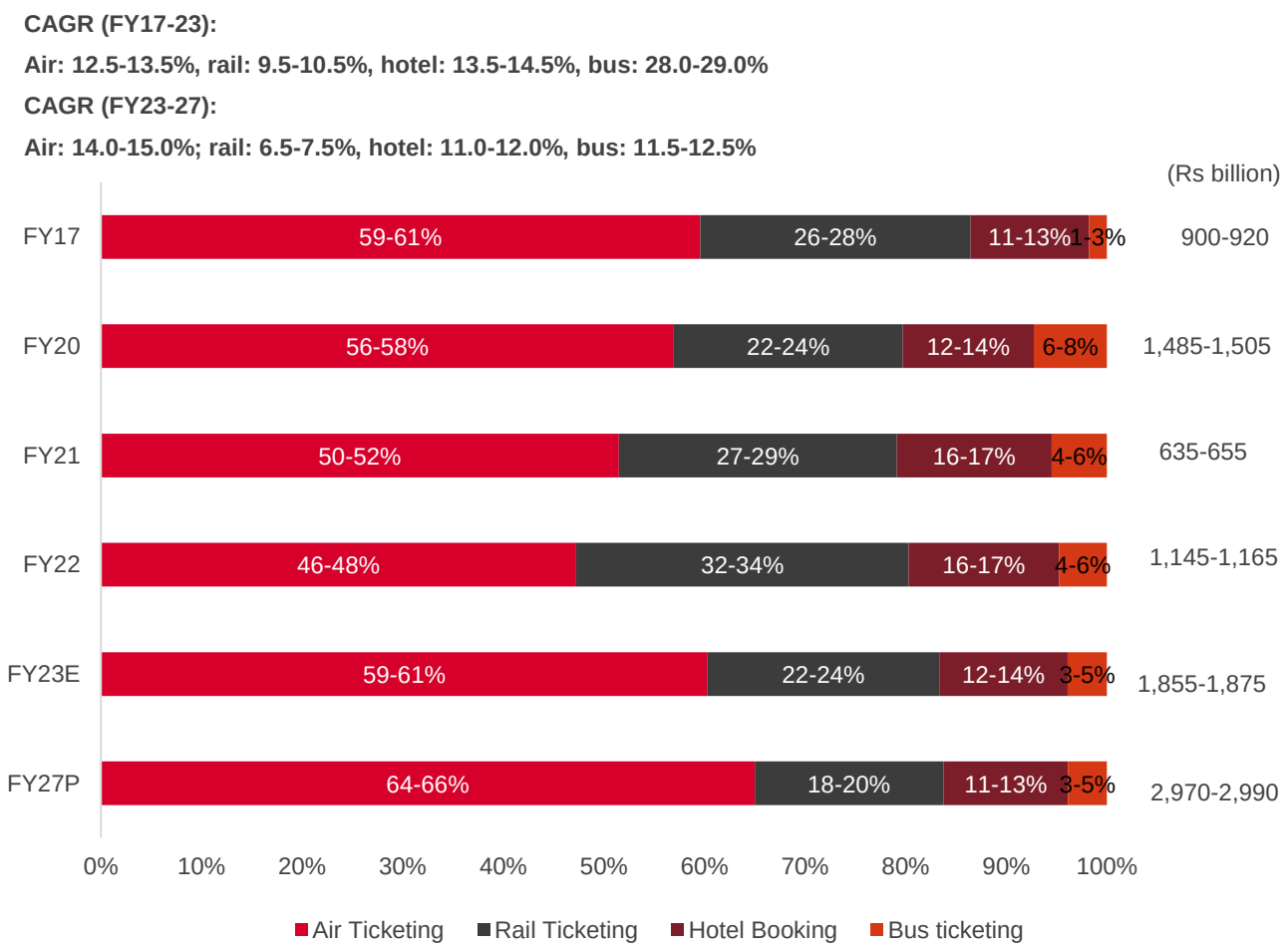
Rail ticketing accounts for 22-24% of the online ticketing industry in India. The IRCTC, which introduced online rail ticketing in 2002, has been instrumental in popularising the online option for bookings in India. As per its annual reports, the share of e-ticketing in total ticket bookings improved from ~55% in fiscal 2015 to ~80% in fiscal 2022. Going forward, online rail ticketing in volume terms is set to grow because of the sheer convenience it offers. Its share in online ticketing industry in India in value terms is expected to be 18-20% by fiscal 2027.

The hotel segment accounts for 12-14% of the online ticketing industry in India. Industry interactions indicate online penetration of hotel bookings in India is relatively lower at 31-33%. The hotel industry is fragmented into many organized and unorganized players. In contrast, the airline services industry is fairly organized as it has a limited number of companies. Thus, adoption of online channels for booking hotel rooms posed a challenge in the initial phases for most players. Additionally, most of the OTAs started offering online booking of hotel accommodation only after establishing a presence in air ticketing. Much of the hotel inventory available online is in metros and tier-I cities,

whose customers have become comfortable with the online platform. Tier-II and -III cities largely continue to operate offline. However, going forward, this is expected to change as customers from tier-II and -III cities start booking rooms online because of convenience. Going forward, the share of online hotel bookings is expected to improve, although at a modest pace, as OTAs compete with captive websites to garner market share. Consequently, its share in the online ticketing market in India is expected to remain steady at 11-13% by fiscal 2027.

Bus ticketing is at a fairly nascent stage, as few players have a presence in this segment. Also, its online penetration remains low (3-5% share) because of the ready availability of tickets with players, both private and state transport corporations. Going forward, its share in online ticketing market is likely to stay the same at 3-5%.

Sub-segments within the online ticketing market based on gross revenue



Note: E: estimated P: projected
The numbers to the right of the bar charts represent total online ticketing market for that year
Source: Industry interactions, CRISIL MI&A Research

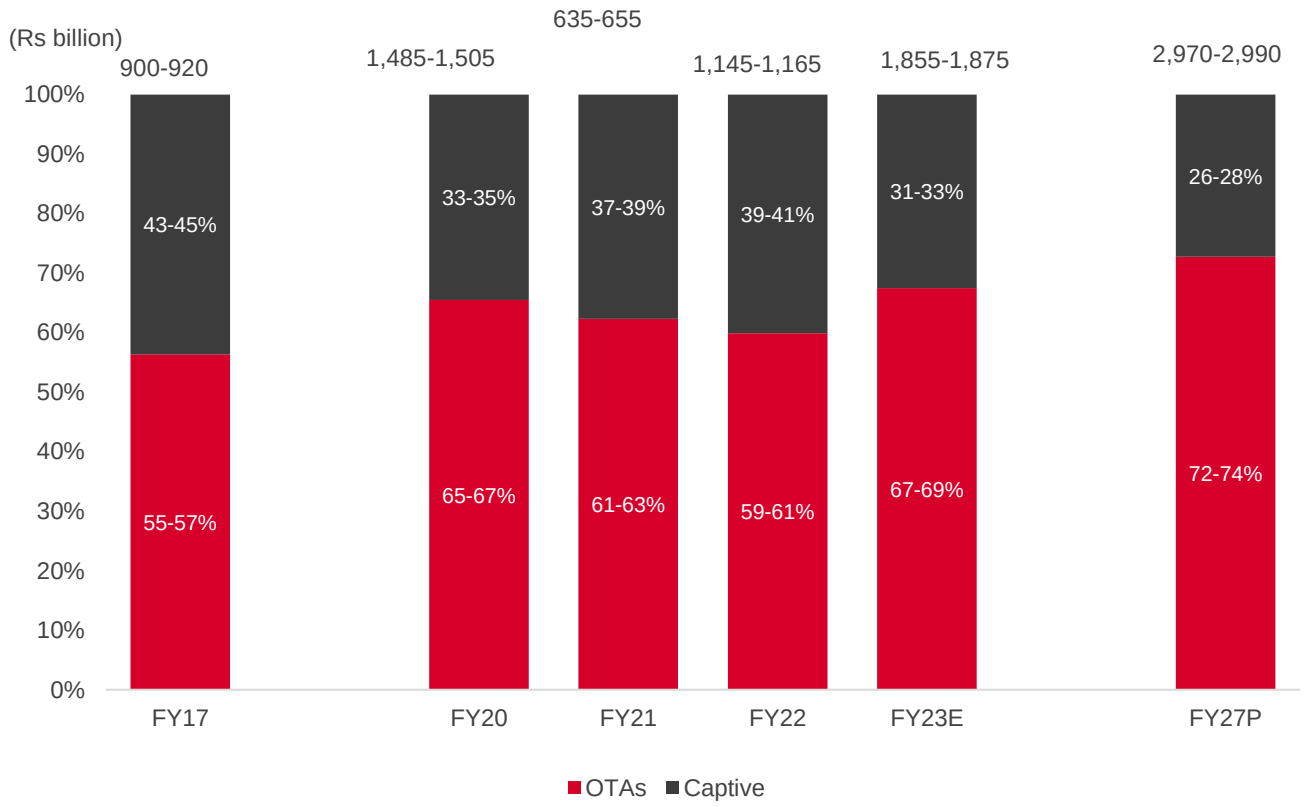
Share of OTAs and captive websites in the Indian online ticketing market

OTAs command 67-69% share of total online ticketing in India

As per industry estimates, in value terms, OTAs accounted for 67-69% of the total online ticketing industry in India as of fiscal 2023, based on gross booking revenue. In absolute terms, it translates to an estimated market size of Rs 1,250-1,270 billion. Their share has grown from 55-57% during fiscal 2017, largely due to comparatively friendly user-friendly interface compared with captive website of service providers and ease of comparison across options. Higher discounts from the OTAs as well as offers by banking partners have also made them competitive in pricing vis-à-vis

captive websites. This trend is expected to continue in the medium term, with the share of OTAs in the online ticketing industry expected to reach 72-74% by fiscal 2027.

Segment-wise share of OTAs in the online ticketing industry in India (based on gross revenue)



Note: E: estimated, P: projected. The online ticketing industry includes bus booking revenue along with flight, rail and hotel bookings.

The numbers above the bar charts represent total online ticketing market for that year

Source: Industry interactions, CRISIL MI&A Research

17.3 Overview of OTA market in India

CRISIL MI&A Research defines Online Travel agencies (OTAs) as companies that specialise in sale of travel-related products and services such as booking of air tickets, hotel rooms, travel packages, bus tickets and railway tickets via their websites and applications. These are typically third-party agents reselling products and services provided/ organised by others for an agreed commission. While sizing the OTA industry, CRISIL MI&A Research has considered net revenue, i.e., typical commissions earned across segments (defined as gross bookings less procurement costs of relevant services and products for sale).

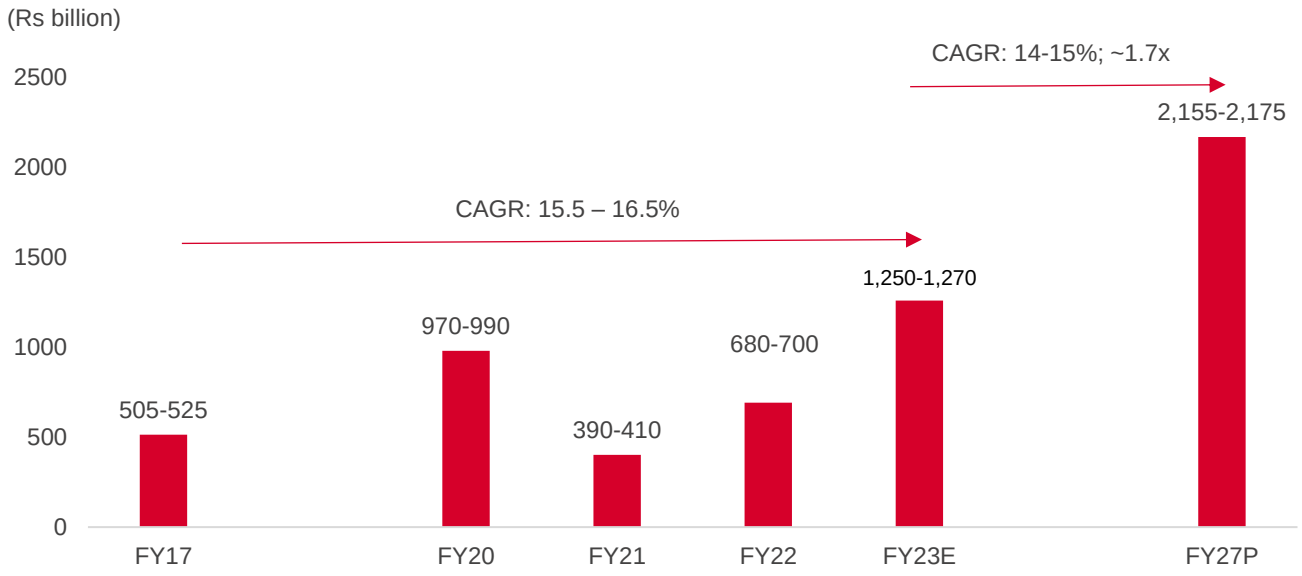
On the other hand, metasearch engines function as search engines for travel needs across multiple sources and showcase them for ease of comparison. A key difference between OTAs and metasearch engines is that the latter typically do not sell any inventory.

CRISIL MI&A Research has not included the metasearch engines while estimating the Indian OTA industry.

Indian OTA market to log 14-15% CAGR over fiscals 2023-2027 in terms of gross booking revenues

CRISIL MI&A Research estimates domestic OTAs' gross booking revenue clocked a 15.5-16.5% CAGR from Rs 505-525 billion in fiscal 2017 to Rs 1,250-1,270 billion in fiscal 2023, driven by rapid growth in affordability of and access to internet, increased awareness and comfort with online transactions, competitive prices offered by OTA players to attract consumers, and growing network of service providers on OTA platforms. These factors are likely to continue to fuel growth of the Indian OTA market in the medium term. The market is expected to grow ~1.7x from fiscal 2023 and log 14-15% CAGR to reach Rs 2,155-2,175 billion by fiscal 2027.

Growth in the Indian OTA industry (based on gross booking revenue)

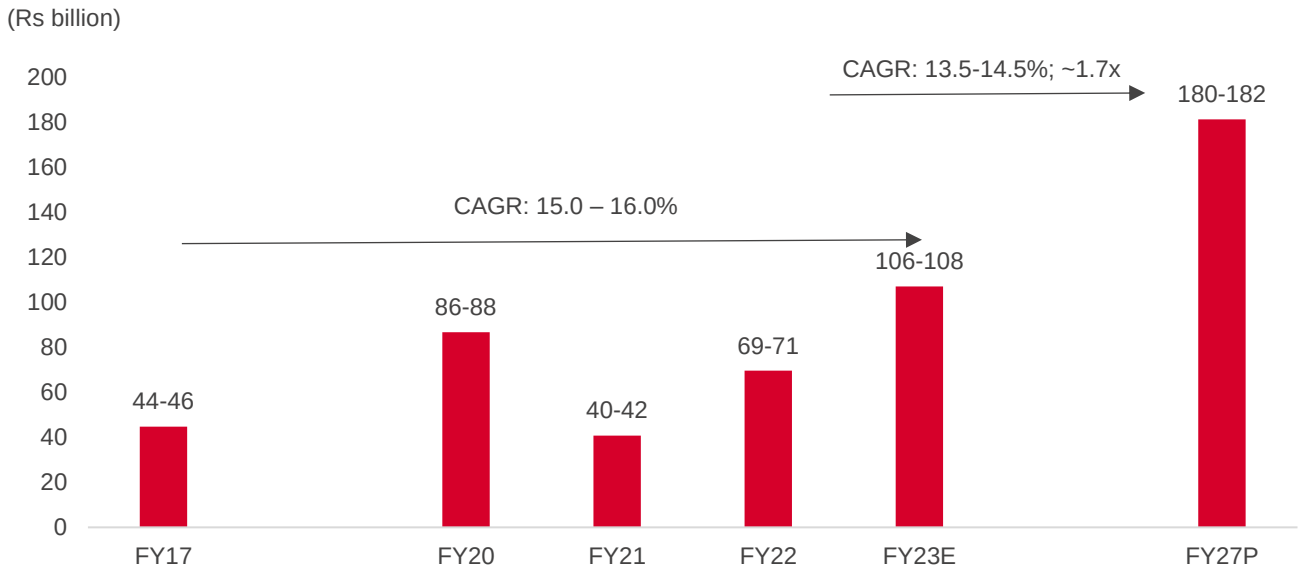


Note: E: Estimated, P: Projected
Market sizing of the Indian OTA industry is based on gross booking revenue, inclusive of bus booking revenue
Source: CRISIL MI&A Research

Indian OTA market in net revenue terms expected to clock 13.5-14.5% CAGR over fiscals 2023-2027

In terms of net revenue, CRISIL MI&A Research estimates the Indian OTA market grew at a 15-16% CAGR from Rs 44-46 billion in fiscal 2017 to Rs 106-108 billion in fiscal 2023. The Indian OTA market is expected to become ~1.7 times its size in fiscal 2023 and grow at 13.5-14.5% CAGR to Rs 180-182 billion by fiscal 2027.

Growth in the Indian OTA industry (based on net revenue)



Note: E: Estimated, P: Projected

Market sizing of the Indian OTA industry is based on net revenue, inclusive of bus booking revenue.

CRISIL MI&A Research considers net revenues i.e. typical commissions earned across segments (defined as gross bookings less procurement costs of relevant services and products for sale) as net revenue

Source: CRISIL MI&A Research

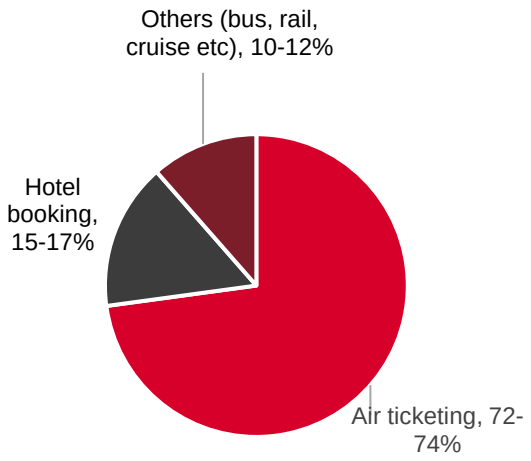
Overview of segment-wise bookings made via OTAs

Air ticketing dominates Indian OTA industry

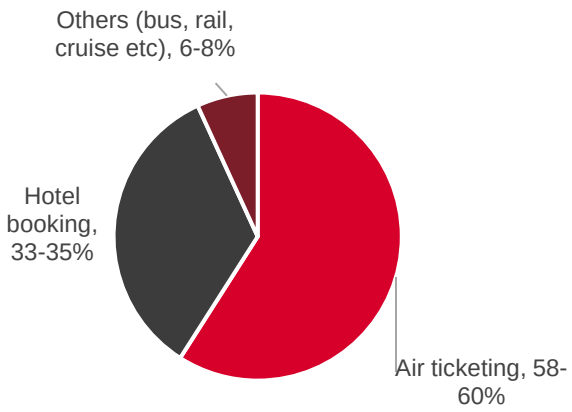
In value terms, air ticketing accounts for 72-74% of the domestic OTA industry (industry estimates). OTAs started off in India by selling airline tickets because it was easier to penetrate the airline services industry, which is largely organised with limited number of players. The hotel industry, on the other hand, is fragmented with several branded and unbranded players. It is relatively easier to list airline ticket inventories online. As the Indian customer began to adopt and accept the online booking process, online booking of airline tickets became more popular. Now, online booking accounts for 74-76% of total airline ticketing in the country. Increased air connectivity to tier-II and -III cities at fairly competitive fares, especially offered by low-cost carriers, also made air travel more popular. As business and leisure travel to such cities via air improved, it has also had a cascading effect on online bookings.

In online air ticketing, OTAs have garnered a significant higher share than captive websites of brands. A distinct advantage of using OTAs websites for customers is that they allow for multi-airline itineraries while captive websites don't. OTAs are also capable of offering deeper discounts than the captive sites. Though all these resulted in an increase in booking volumes for OTAs, the share of air ticketing in their revenue has been declining on account of lower margins in the segment. As a result, OTAs are now shifting focus to other higher-margin segments.

Segment-wise share in Indian OTA market, as of fiscal 2023 (based on gross revenue)



Segment-wise share in Indian OTA market, as of fiscal 2023 (based on net revenue)



Source: CRISIL MI&A Research

Hotels account for 15-17% of OTA revenue

Hotel bookings account for 15-17% of OTAs' revenues as of fiscal 2023, according to industry estimates. Due to the fragmented nature of the Indian hotel industry, share of online bookings in overall bookings has remained low (estimated at 31-33% as of fiscal 2023). In the online segment, however, OTAs have managed to gain a dominant share over captive websites of hotel chains. As in the case of airline ticketing, options to compare multiple options and highly competitive pricing helped OTAs gain market share over captive websites. Moreover, compared with airline ticketing, margins in hotel bookings are higher, thus making it a lucrative segment for OTAs to focus on. This is also reflected in the growing share of the hotels segment in the revenue mix of major OTA players. However, recent industry interactions indicate larger hotel chains are now encouraging customers to book via captive websites in order to counter the high commissions of OTAs.

Bus, train bookings' form 10-12% of OTA revenue

For online booking of railway tickets, the IRCTC remains the preferred player for travellers. Although some OTAs do offer the service, ticket booking is still routed via the IRCTC website. It accounts for a marginal share in OTA revenue.

Tickets for inter-state travel are typically booked through traditional travel agents (TTAs) or at their respective offices. Given the ready availability of such tickets in the offline mode, online channels that offer the tickets are too few. Players such as the Gujarat State Road Transport Corporation (GSRTC), Maharashtra State Road Transport Corporation (MSRTC) and Karnataka State Road Transport Corporation (KSRTC) provide online booking facility on their captive websites. Also, there are several city or region-specific private players which traditionally enjoy market share and mind recall. While most of them now have their own websites for bookings, there are many which are also available on OTA platforms.

Non-air bookings to gain share in the medium to long term

While air ticketing enjoys the maximum share in the overall OTA industry, margin in the business is lower than hotel or holiday packages business. The main reason for this is the level of service component involved. Additionally, most airlines are financially constrained as high operational costs are impacting their margins.

In contrast, service components associated with hotels and holiday packages are comparatively higher and they reflect in the margins earned as well. Although most OTAs commenced operations by selling airline tickets, they are now focussing on other segments, such as hotels and holiday packages, in order to boost their bottom line. This is reflected in segment-wise share of large OTAs as well. Some of them are also looking at mergers and acquisitions in order to gain market share in other segments. For example, MakeMyTrip acquired the Ibibo Group in January 2017 in order to strengthen presence in key markets and expand product portfolio. With the acquisition, MakeMyTrip was able to gain presence in the budget hotel segment. The company also got RedBus as part of the deal, which helped it foray into the bus bookings segment. In August 2017, Yatra acquired major stake in Air Travel Bureau Ltd (ATB) and in July 2020, it acquired the remaining shares making it a subsidiary. Air Travel Bureau Ltd (ATB) which specialises in corporate travel management, MICE and leisure tourism. The acquisition strengthened Yatra's portfolio in the corporate travel segment. Earlier, in 2012, it had acquired TravelGuru in order to boost its domestic hotels and holiday's business. Prior to that, the company had bought Travel Services International (TSI), a ticket consolidator focussed on the B2B space; MagicRooms, engaged in hotel aggregation and reservation and a global distribution system (GDS) provider of hotel rooms; and BuzzInTown, an event listing site in order to widen its portfolio. Going forward, the share of non-air segment in the overall OTA market is expected to improve.

17.4 Charges levied by OTAs

OTA		Flight booking (INR)
cleartrip	Cleartrip	300
EaseMyTrip.com	EaseMyTrip	250
goibibo.com	GoIbibo	300
IRCTC	IRCTC	250
ixigo	Ixigo	329
make my trip	MakeMyTrip	300
Paytm	Paytm	319
yatra	Yatra	400

Note: The above-mentioned charges are for domestic flight booking as of 11th January 2022; OTAs levy the above-mentioned charges either at the time of ticket booking or while cancelling.

Source: Company website, CRISIL MI&A Research

18 Competitive landscape

India's digitisation efforts have evolved the digital and financial services landscape at a rapid pace. There are several existing players that are working in delivering these digital services across India. The business of the digital service providers can be classified into three broad categories.

- **Business Correspondent Services**: The companies acting as Business Correspondent offer services such as account opening, cash deposit, cash withdrawal, fund transfer, term and recurring deposits, balance enquiry, AePS, etc.
- **G2C Services**: The services related to Aadhar, pension schemes, PAN card, insurance, passport, and other government schemes are covered under this segment.
- **Other Services**: This segment includes services related to PoS, ticketing, assisted e-commerce, bill payments, skill development, tele medicine, tele agriculture, etc. These services can be further expanded to include retail and digital education businesses to ensure last mile delivery.

Business Correspondent Services

A Business correspondent (BC) is an entity which acts as a teller for the bank and carry out a full range of transactions on behalf of the bank, in return for commissions on the services rendered. It is a model that enables people in remote areas of India to access formal financial institutions. With the objective of ensuring greater financial inclusion and increasing outreach of the banking sector, the Reserve Bank of India has allowed banks to use the services of intermediaries operating, among others, as common service centers as retail agents who represents banks and are responsible for providing financial and banking services at locations other than bank branch / ATM. The concept of BCs is to address the needs of banks, which need to reach out to a wider section of society, as well as underprivileged people with no access to credit. With no access to credit, underprivileged people often have to invest their personal savings in health and entrepreneurial activities, leaving them highly vulnerable to adverse circumstances. BCs support banks in providing its limited range of banking services at affordable cost. Thus, they are pivotal in promoting financial inclusion. The BC model helps banks in bringing door-step delivery of services especially 'cash in - cash out' transactions in rural and remote areas, thus resolving the issue of last-mile delivery.

The business correspondent landscape in India is evolving at a rapid pace with the emergence of various new players such as

- Payment banks that act as a BCs and offer a host of solutions to their target customers which includes underserved and unserved people in rural and semi-urban areas of India
- Pure play business correspondent companies looking to provide all kinds of offerings such as banking services, selling of third-party products

As per the Reserve Bank of India's (RBI) FY22 annual report, the total number of business correspondents in villages has increased from more than 1.19 million in 2021 to 2.21 million in 2022, reflecting the penetration and scale that banks generate partnering with BCs. At end of fiscal 2022, almost 98% of banking outlets in villages are through business correspondents. Urban locations covered by banks through the BC channels also rose to 1.3 million in 2022 from 0.6 million in 2020, as per RBI data.

While the nuances underlying the business model and the target customer segment of these companies may be different, there is a common underlying thread across all these players i.e. to leverage technology effectively to provide a range of services in a seamless and more efficient manner to their customers. Moreover, several players are also seeing improvement in the unit economics, with an increase in size and scale.

G2C Services

Since past few decades, both Central and State governments have strived to deliver its services to citizens online at their doorsteps. The delivery of government services using technology is known as e-governance. There are several government initiatives, such as Passport Seva, DigiLocker, online public distribution system, UPI, and Aarogya Setu, etc. which have earned universal accolades. The initiatives have been highly successful; however, a need was felt to develop a holistic view of various e-governance initiatives that are implemented across the country. To improve the delivery of government services, government of India came up with National e-Governance Plan (NeGP) in 2006. The key elements of NeGP include common support infrastructure, mission mode projects, Public-Private Partnerships (PPP), centralized initiatives and decentralized implementation etc. Since the implementation of NeGP, the e-governance has been made efficient by involving private players in the delivery of citizen centric services.

Department of Administrative Reforms & Public Grievances (DARPG) had formulated the National e-Governance Service Delivery Assessment (NeSDA) in 2019 as part of its mandate to boost the e-governance endeavours and drive digital government excellence. The biennial study assesses States, Union Territories (UTs), and focus Central Ministries on the effectiveness of e-governance service delivery. NeSDA helps the respective governments improve their delivery of citizen centric services and shares best practices across the country for all States, UTs and Central Ministries to emulate.

As per NeSDA report for States/UTs (March 2023)[3]:

- Departments across States/UTs provide 15,601 services
- 12,561 out of 15,601 services are provided online, i.e., 12,561 e-services are provided across States/UTs
- 80.5% of the services are digitized across States/UTs
- 1,400 out of 2,016 mandatory e-services are available, making saturation at 69.4%

Other Services

With the increase in digital adaptation, the demand for various other services have also increased. The increasing digitalization is boosting the market for insurance services, online ticketing, assisted e-commerce, bill payments, tele medicine, tele agriculture, digital learning, etc. in urban, semi-urban and rural areas. With huge touch points of the business correspondent companies, they can provide these services to even remotest areas. Additionally, even retail/wholesale stores can distribute and/or sell their products through these companies' touch points. It will pave way for additional income for business correspondent companies.

Industry Players

For the purpose of peer comparison, CRISIL MI&A Research has considered the following players in its study: BLS E-services Limited, Digispice Technologies, FINO Paytech Limited, CSC E-Governance Services India limited, NICT Technologies Private Limited, FIA Technology Services Private Limited, Mobisafar Services Private Limited, AISECT Limited and eMudhra Limited.

[3] Note: The aforementioned count of services is cumulative and tentative in nature, and are provided by States/UTs as of 25/03/2023. Count of mandatory e-services is taken as per NeSDA 2021.

BLS E-Services offers variety of digital services among the peers compared

Company Name	Type of Services Offered
BLS E-Services	Banking services, E-governance services, Ayushman Bharat, Recharges, Bill payments, Money transfer, Travel booking, Aadhaar payments, Mini ATM, Assisted E-commerce, Passport & Visa applications, Insurance, E-learning, Online doctor consultation, etc.
Digispice Technologies	Banking services, Payment services, Travels services, Insurance, Device services, PAN card services, E-commerce facilities, Platforms and communication channels for enterprises, Travel services, Digital entertainment solutions, Content aggregator, etc.
Fino Paytech Limited	Banking services, Consultancy services, financial literacy, Customer enrolment solutions, Hardware solutions, Operations solutions, Government services (MNREGA, SSP), Insurance
CSC E-Governance Services India limited	Banking services, E-governance services
NICT Technologies private limited	Banking services, E-Governance services, Ticketing services, RFID services, etc.
FIA Technology	Banking services
Mobisafar Services Private Limited	Banking services, Travels services, Bill payments, Insurance, PAN card services,
AISECT Limited	Skill development, higher education, services for financial inclusion, e-governance services, etc.
eMudhra Limited	Digital certificate/signature services, Trust services, Authentication and access services, Artificial intelligence services, Data security and analytics services

Source: Companies' websites

BLS E-Services has 92,427 touch points as on 31st March, 2023

The total number of touch points/coverage of the peers are mentioned below:

Company Name	Touch points/Coverage
BLS E-Services	92,427
Digispice Technologies	18,500+ pin codes
Fino Paytech Limited	499 districts
CSC E-Governance Services India limited	5,19,652
NICT Technologies private limited	16,440

FIA Technology Services	712 districts, 46,000 villages
Mobisafar Services Private Limited	10,000+
AISECT Limited	475 districts, 20,000+ centres

Source: Companies' websites

BLS E-Services operates the largest BC network for largest PSB in the country

BLS E-Services operates the largest BC network for largest public sector bank 'SBI' through its subsidiaries Zero Mass Private Limited and Starfin India Private Limited which had 10,903 and 1,633 CSPs respectively.

SBI BCs	CSPs (As of 31/08/2022)
Zero Mass Private Limited	10,903
Save Solutions Private Limited	8,258
NICT Technologies Private Limited	6,166
FIA Technology Services Private Limited	4,383
Sanjivani Vikas Foundation Bihar	3,485
CSC eGovernance Services India Limited	3,420
Pay Point India Network Private Limited	3,067
AISECT Limited	2,787
Vedavaag Systems Limited	2,331
Starfin India Private Limited	1,633
Oxigen Services India Private Limited	1,627
Drishtee Development Communication	1,517
Sub-k Impact Solutions Limited	1,317
Circle BCs	17,320

Source: SBI, CRISIL MI&A Research

BLS E-Services witnessed the highest revenue growth of 50.8% between FY21 and FY22

Among the peers compared, BLS E-Services witnessed a highest revenue growth of 50.8%, followed by Emudhra Limited and Digispice Technologies which registered revenue growth of 39.4% and 37.2% respectively between fiscal 2021 and fiscal 2022.

Trend in Revenue (Rs billion) growth for all the peers

Company Name	FY21	FY22	Growth %
AISECT Limited*	0.91	1.05	15.4%
BLS E-Services	0.65	0.98	50.8%
CSC E-Governance	14.92	18.27	22.5%
Digispice Technologies	7.37	10.11	37.2%
Emudhra Limited	1.32	1.84	39.4%
FIA Technology Services	1.20	NA	-
FINO Paytech	8.60	10.51	22.2%
Mobisafar Services*	0.88	0.67	-23.9%
NICT Technologies	1.70	1.76	3.5%

*Note: *Standalone financials are considered; Players are arranged in an alphabetical order.*

Source: Company filings, CRISIL MI&A Research

Emudhra Limited recorded highest EBITDA and PAT margin

Among the peers compared, between fiscal 2021 and fiscal 2022, Emudhra Limited recorded the highest EBITDA and PAT margins at average 33.8% and 18.2% respectively, followed by CSC E-Governance. It recorded average EBITDA and PAT margins at 15.1% and 8.9% between fiscal 2021 and fiscal 2022. BLS E-services recorded average EBITDA margin of 8.6% and PAT margin of 5.2%.

Trend in EBITDA Margin for all the players in the peer set

Company Name	FY21	FY22	Average
AISECT Limited*	6.0%	8.5%	7.3%
BLS E-Services	8.4%	8.8%	8.6%
CSC E-Governance	16.0%	14.1%	15.1%
Digispice Technologies	5.1%	3.5%	4.3%
Emudhra Limited	30.2%	37.4%	33.8%
FIA Technology Services	17.3%	NA	-
FINO Paytech	6.5%	2.1%	4.3%
Mobisafar Services*	10.9%	11.4%	11.2%
NICT Technologies	7.2%	5.4%	6.3%

*Note: *Standalone financials are considered; Players are arranged in an alphabetical order.*

Source: Company filings, CRISIL MI&A Research

Trend in PAT Margin for all the players in the peer set

Company Name	FY21	FY22	Average
AISECT Limited*	3.6%	5.5%	4.6%
BLS E-Services	4.8%	5.5%	5.2%
CSC E-Governance	9.3%	8.5%	8.9%
Digispice Technologies	0.8%	0.7%	0.8%
Emudhra Limited	14.0%	22.4%	18.2%
FIA Technology Services	12.5%	NA	-
FINO Paytech	-5.9%	-5.1%	-5.5%
Mobisafar Services*	6.7%	5.6%	6.2%
NICT Technologies	4.4%	2.7%	3.6%

*Note: *Standalone financials are considered; Players are arranged in an alphabetical order.*

Source: Company filings, CRISIL MI&A Research

Mobi-safar services registered highest return on equity (RoE) within the peer set

Among the peers compared, between fiscal 2021 and fiscal 2022, Mobisafar Services registered the highest average RoE at 55.6% followed by NICT Technologies which registered average RoE of 45.5% between fiscal 2021 and fiscal 2022. In fiscal 2022, BLS E Services recorded RoE of 43.5%.

Trend in RoE for all the players in the set

Company Name	FY21	FY22	Average
AISECT Limited*	8.3%	13.2%	10.8%
BLS E-Services	-	43.5%	-
CSC E-Governance	27.6%	22.2%	24.9%
DigiSpice Technologies	2.4%	2.7%	2.6%
Emudhra Limited	18.6%	31.9%	25.3%
FIA Technology Services	45.0%	NA	-
FINO Paytech	-26.0%	-7.4%	-16.7%
Mobisafar Services*	80.6%	30.6%	55.6%
NICT Technologies	64.0%	27.0%	45.5%

*Note: * Standalone financials are considered; #Average of FY21 and FY22; Players are arranged in an alphabetical order*

Source: Company filings, CRISIL MI&A Research

Emudhra Limited registered highest average return on asset (RoA) within the peers for fiscal 2021 and fiscal 2022

Emudhra Limited recorded highest average RoA of 15.1% between fiscal 2021 and fiscal 2022 followed by NICT Technologies which registered average ROA of 13.8% among the peers compared. FIA Technology Services registered RoA of 25.6% in fiscal 2021.

Trend in RoA for all the players in the set

Company Name	FY21	FY22	Average
AISECT Limited*	4.6%	7.0%	5.8%
BLS E-Services	-	11.1%	-
CSC E-Governance	8.3%	8.5%	8.4%
DigiSpice Technologies	1.2%	1.1%	1.2%
Emudhra Limited	11.2%	18.9%	15.1%
FIA Technology Services	24.3%	NA	-
FINO Paytech	-4.3%	-2.8%	-3.6%
Mobisafar Services*	17.3%	7.5%	12.4%
NICT Technologies	17.8%	9.7%	13.8%

*Note: *Standalone financials are considered; Players are arranged in an alphabetical order.*

Source: Company filings, CRISIL MI&A Research

BLS E-services' financials (consolidated) in fiscal 2023

Particulars	FY23
Revenue (Rs billion)	2.46
EBITDA Margin	14.7%
PAT Margin	8.3%
RoE	33.3%
RoA	17.3%

Source: Company filings, CRISIL MI&A Research

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