CRISIL
An S&P Global Company

Assessment of broadband and television broadcasting industries in India

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1 Global macroeconomic assessment

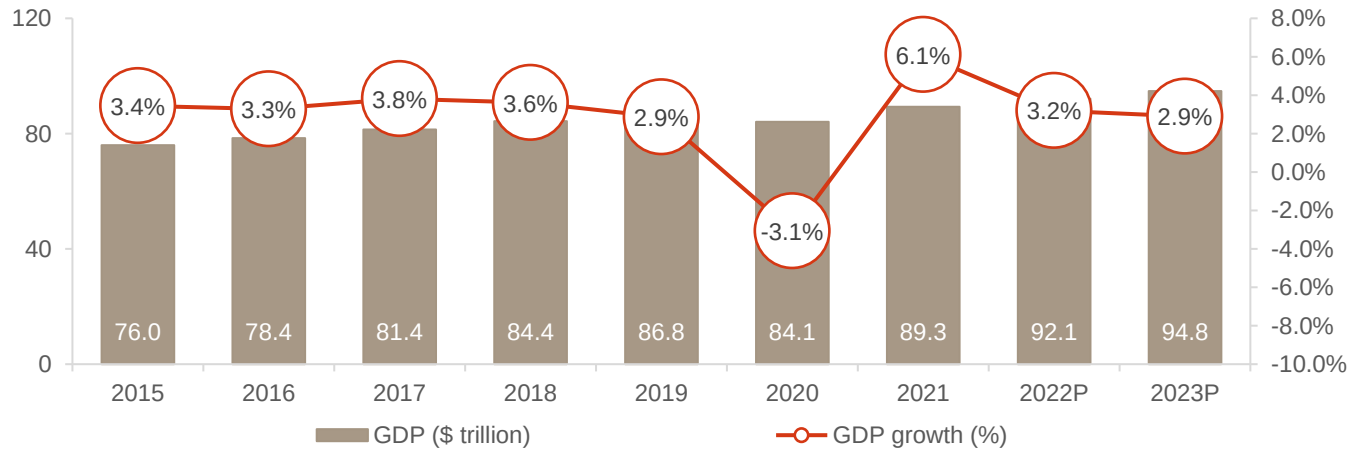
Global GDP review and outlook

Global GDP rebounded strongly in 2021 on account of policy support and vaccination drives after dropping in 2020. GDP growth is expected to moderate slightly in 2022 with 3.2% y-o-y rise

As per IMF's July 2022 update, global growth is expected to moderate from 6.1% in 2021 to 3.2% in 2022 and 2.9% in 2023. This is 0.4% and 0.7 % points lower for 2022 and 2023 than projected in April 2022. Economic damage from the Russia-Ukraine conflict will contribute to a slowdown in global growth in 2022. According to IMF, the economic damage from the ongoing war in Ukraine has contributed to a slowdown in global growth and rising inflation causing damage to various countries. The war has caused a humanitarian crisis in Eastern Europe, and various sanctions being imposed on Russia to end hostilities. In addition, frequent and wider-ranging lockdowns in China have slowed activity as it is a major manufacturing hub, which could cause new bottlenecks in the global supply chain. Further, Russia is a major supplier of oil, gases and metals and Ukraine is a major supplier of wheat and corn, and an anticipated decline in the supply of these essential commodities is likely to spike up the prices in the global commodities market. High uncertainty surrounds the current IMF forecast, and there are downside risks to the global outlook.

According to IMF (World Economic Outlook – July 2022), global growth prospects have changed markedly since beginning of the year owing to geopolitical issues. In CY2021, global growth rebounded with a robust growth of 6.1% from -3.1% the previous year, but it is expected to slow in calendar year 2022 to 3.2%.

Trend and outlook for global GDP (2015-23P, in $ trillion)



P: Projection

Source: IMF economic database, World Bank national accounts data, OECD national accounts data, CRISIL Research

India regained the top spot as the world's fastest growing economy in 2021 among key nations

India was one of the fastest-growing economies in 2018 and 2019. In 2020, the GDP of all countries – including that of developed ones such as the US and the UK (except China) contracted, primarily due to the impact of the pandemic.

India's GDP shrunk 6.6% in 2020. In 2021, the GDP growth of all major economies rebounded as economic activities resumed and due to the low base of 2020. Among the major economies, India, with a growth rate of ~8.7%, was the fastest growing in 2021, followed by China with 8.1%. India is expected to grow at faster rate than China in 2022 and 2023.India's GDP is expected to clock a growth of 8.2% in 2022 and 6.1% in 2023 as per IMF forecast.

Real GDP growth by geographies

Regions	2017	2018	2019	2020	2021	2022P	2023P
Japan	1.7	0.6	-0.2	-4.5	1.7	1.7	1.7
US	2.3	2.9	2.3	-3.4	5.7	2.3	1
Euro area	2.6	1.8	1.6	-6.4	5.4	2.6	1.2
United Kingdom	1.2	1.3	1.4	-9.4	7.4	3.2	0.5
World	**3.7**	**3.6**	**2.9**	**-3.1**	**6.1**	**3.2**	**2.9**
China	6.9	6.8	6	2.2	8.1	3.3	4.6
India*	**6.8**	**6.5**	**3.7**	**-6.6**	**8.7**	**7.4**	**6.1**

P: Projection as per IMF update

**-Numbers for India are for financial year (2020 is FY21 and so on) and as per IMF forecast.*

Source: IMF economic database, World Bank national accounts data, OECD national accounts data, CRISIL Research

Review of global per capita GDP

India's per capita GDP projected to grow at ~1.5x global per capita GDP growth rate between 2021 and 2025

Global GDP per capita (current prices) grew at 3.79% CAGR between 2016 and 2021, as per IMF data. In the case of India, it was ~5.68% CAGR between 2016 and 2021. From 2021 to 2025, the IMF projects global per capita GDP (current prices) to grow at ~5.53% CAGR. During the period, India's per capita GDP is expected to sustain a higher growth trajectory of ~9.17% CAGR.

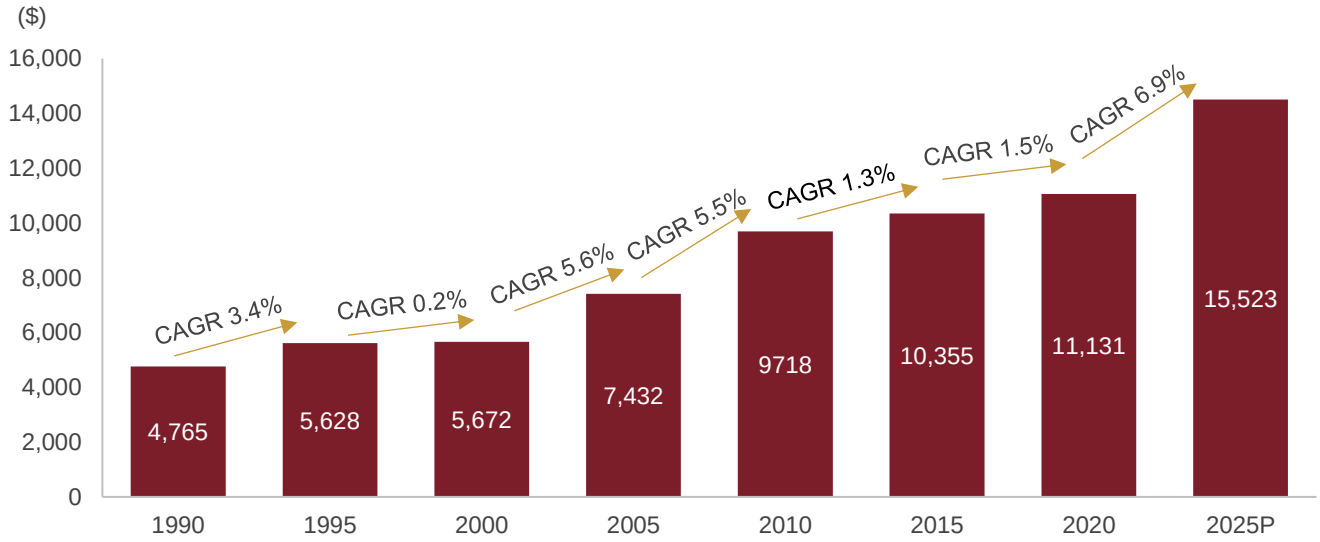
Global and Indian per capita GDP growth at current prices

	2016	2017	2018	2019	2020	2021	2025P	CAGR 2016-2021	CAGR 2021-2025
Per capita GDP – Global (current prices $)	10,393	10,903	11,471	11,540	11,131	12,517	15,523	3.79%	5.53%
On-year growth (%)		4.9%	5.2%	0.6%	-3.5%	12.5%	NA	NA	NA
Per capita GDP – India (current prices $)	1,732	1,981	1,998	2,070	1,935	2,283	3,243	5.68%	9.17%
On-year growth (%)		14.4%	0.9%	3.6%	-6.5%	18.0%	NA	NA	NA

NA: Not applicable, Note: P – Projection

Source: IMF, CRISIL Research

Global per capita GDP growth at current prices

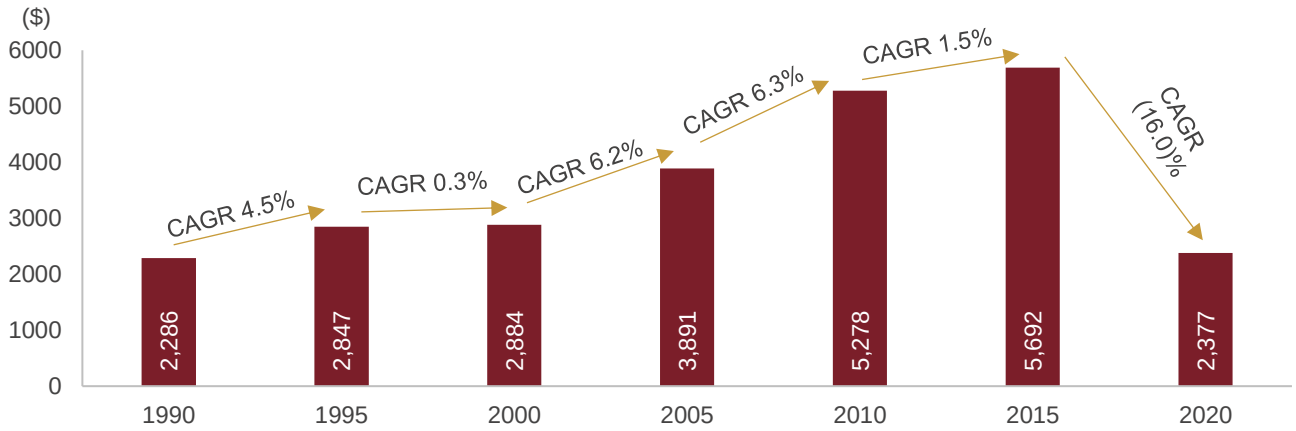


Source: IMF, CRISIL Research

Global private consumption was sharply hit by the pandemic between fiscals 2015 and 2020

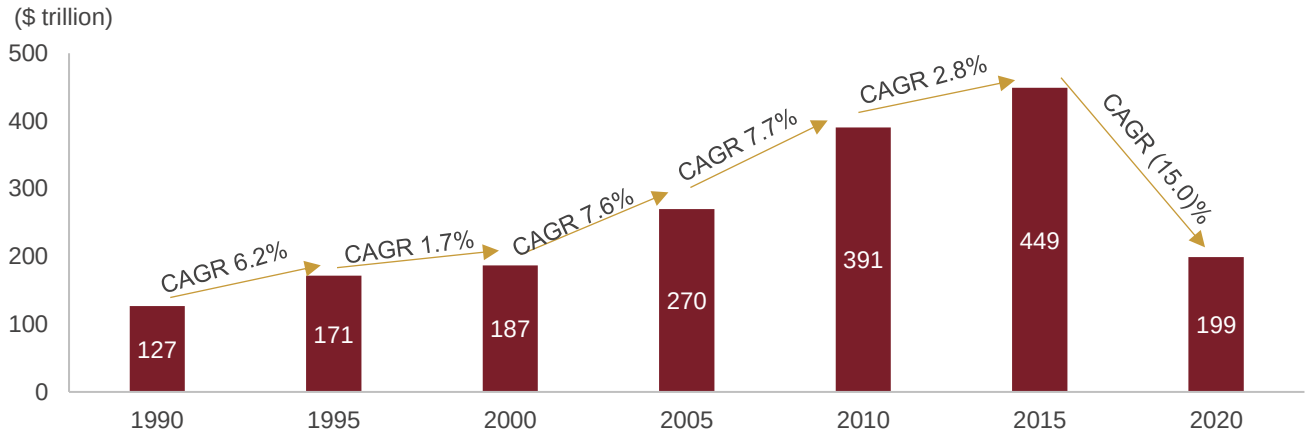
The main drivers of the rise in domestic consumption in the past have been an expanding middle class, rising income levels, population growth, urbanisation, and increased digital services. Rapid economic growth has lifted people out of poverty and into the middle class in recent decades. However, because of the pandemic, world GDP, and subsequently GDP per capita, suffered a shock. Lockdowns and travel restrictions imposed in various parts of the world to control the spread of the virus and accompanying economic slowdown decreased global per capita consumption by 16% between 2015 and 2020.

Global per capita consumption



Source: World Bank, CRISIL Research

Final consumption expenditure



Source: World Bank, CRISIL Research

2 Macroeconomic overview of India

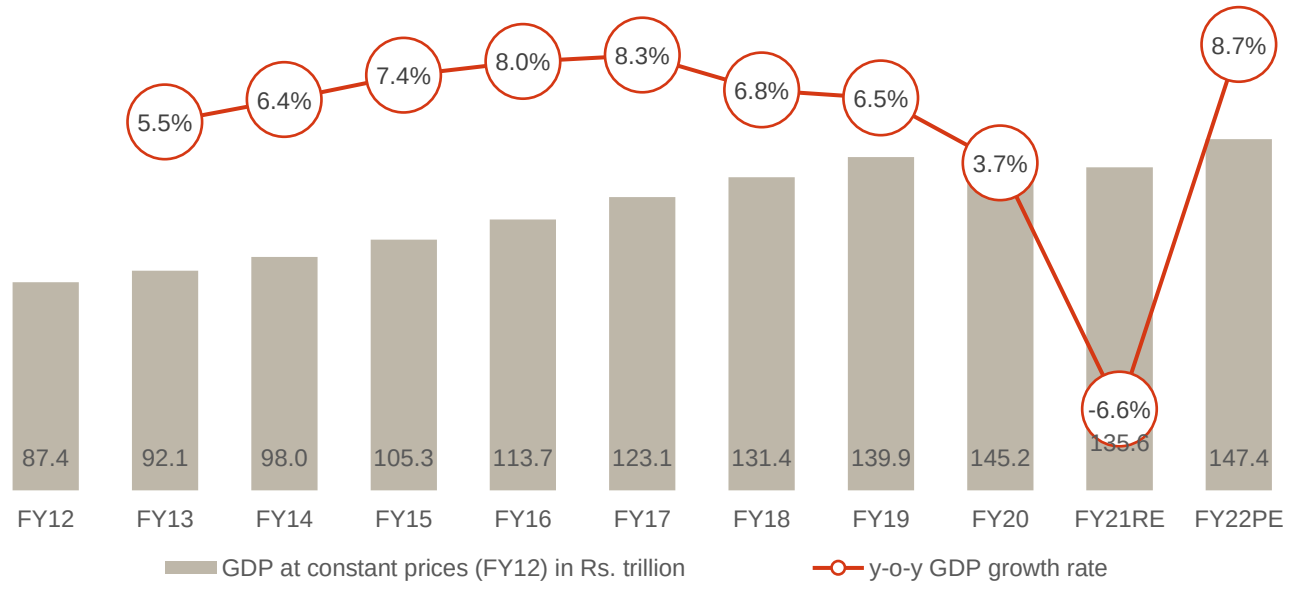
Review of India's GDP

GDP logged 6.6% CAGR between fiscals 2012 and 2020

In 2015, the Ministry of Statistics and Programme Implementation (MoSPI) changed the base year for calculating India's GDP between fiscals 2005 and 2012. Based on this, the country's GDP logged an eight-year CAGR of 6.6%, growing to Rs 146 trillion in fiscal 2020 from Rs 87 trillion in fiscal 2012.

Fiscal 2021 was a challenging year for the Indian economy because of the covid-19 related distress, which was already experiencing a slowdown before the pandemic struck. GDP contracted 6.6% (in real terms) after growing 3.7% in fiscal 2020. India's GDP (in absolute terms) dropped to Rs 136 trillion in fiscal 2021.

Real GDP growth in India (new GDP series)



PE: Provisional estimates; RE: Revised estimates

Source: Provisional estimates of national income 2021-22, Central Statistics Office (CSO), MoSPI, CRISIL Research

Economy rebounded in second half of fiscal 2021, recovery continued in fiscal 2022

After contracting in the first half because of Covid-19, the economy rebounded in the second half of fiscal 2021, growing 0.5% and 1.6% on-year in the third and fourth quarters, respectively. While the economy shrank as a whole in fiscal 2021, agriculture and allied activities, and electricity, gas, water supply and other utility services were the outliers, logging positive growth. On the other hand, contact-intensive trade, hotels and transport sectors, and services related to broadcasting were hit the most, and continued to contract in all the quarters. Construction – a labour-intensive sector – was also severely hit in the first half, but rebounded in the second half.

The economy is in recovery mode, with GDP expanding 20.1% on-year in the first quarter of fiscal 2022, 8.4% in the second quarter and 5.4% in the third quarter. Slower third quarter growth is partly due to the waning away of

the low-base effect of the previous year, when the economy had begun expanding post the first pandemic wave. Third quarter growth also seems to have been impacted by lower government investment spend. In absolute terms, GDP for the second quarter only just crossed the value reported in the first quarter of fiscal 2020 (pre-Covid), representing a rise of 1.1%. The economic rebound comes on the back of reduced pandemic restrictions and improving vaccination coverage. Real GDP growth slowed to 4.1% on-year in Q4 from 5.4% in Q3, led by a sharp slowdown in private final consumption expenditure (PFCE) . That said, both government final consumption expenditure (GFCE) and GFCF registered higher growth in Q4. To be sure, a part of the slowdown in Q4 GDP growth is also attributed to base effect.

GDP in fiscal 2022 grew at 8.7% on-year

Fiscal 2022 is also seen as a story of two halves — the first half characterised by a base effect-driven recovery amid the challenges associated with resurgence in Covid-19 infections, and the second half seeing a more broad-based growth, as vaccine rollout and less stringent nationwide restrictions supporting lagging sectors. The gains made by the economy in the fourth quarter of fiscal 2021 have fizzled out in the first quarter of fiscal 2022 because of the fierce second wave, which led to localised lockdowns in most states.

As per the provisional estimates released by the National Statistical Office, India's real gross domestic product (GDP) grew at 8.7% in fiscal 2022, compared with 8.9% estimated in February. This is largely a reflection of a lower base (as the economy had shrunk 6.6% in fiscal 2021). It is noteworthy that given the large output loss last fiscal, GDP is still only 1.5% above the pre-pandemic (fiscal 2020) level.

While the provisional estimates show a mild reduction in the overall size of the GDP, estimates of private final consumption expenditure (PFCE) and gross fixed capital formation (GFCF) – the biggest two demand-side drivers – were marginally notched up. The latter suggests the government's continued focus on capital expenditure (capex). PFCE is still just 1.4% above the fiscal 2020 level and was the slowest to recover. Moreover, it faces strong headwinds from rising inflation

Also, stronger global growth should support India's exports to some extent. Revival will not be uniform across sectors, though. So far, the rural economy has been more resilient than the urban.

From a supply side perspective, i.e. gross value add (GVA), a much clearer measure of the economy's performance for last fiscal emerges. Based on this metric, the economy shrank by 4.8% (compared with 3.8% growth in fiscal 2020). In absolute terms, real GVA was Rs 125.9 trillion last fiscal, down from Rs 127.3 trillion in fiscal 2019.

Gross value added (GVA) at basic prices (constant 2011-12 prices)

Rs trillion	FY20	FY21RE	FY22PE	Percentage share in GVA	On year growth FY22
Agriculture, Forestry and Fishing	19.8	20.5	21.1	15.5%	3.0%
Mining and Quarrying	3.2	2.9	3.3	2.4%	11.6%
Manufacturing	22.6	22.5	24.7	18.2%	9.9%
Electricity, Gas, Water supply and Other Utility Services	3.0	2.9	3.1	2.3%	7.5%

Construction	10.4	9.6	10.7	7.9%	11.5%
Trade, Hotels, Transport, Communication and Services Related to Broadcasting	26.9	21.5	23.9	17.5%	11.1%
Financial, Real Estate and Professional Services	29.0	29.6	30.9	22.7%	4.2%
Public Administration, Defence and Other Services	17.3	16.3	18.4	13.5%	12.6%
GVA at basic prices	132.2	125.9	136.1		8.1%

RE: Revised estimates PE: Provisional estimates

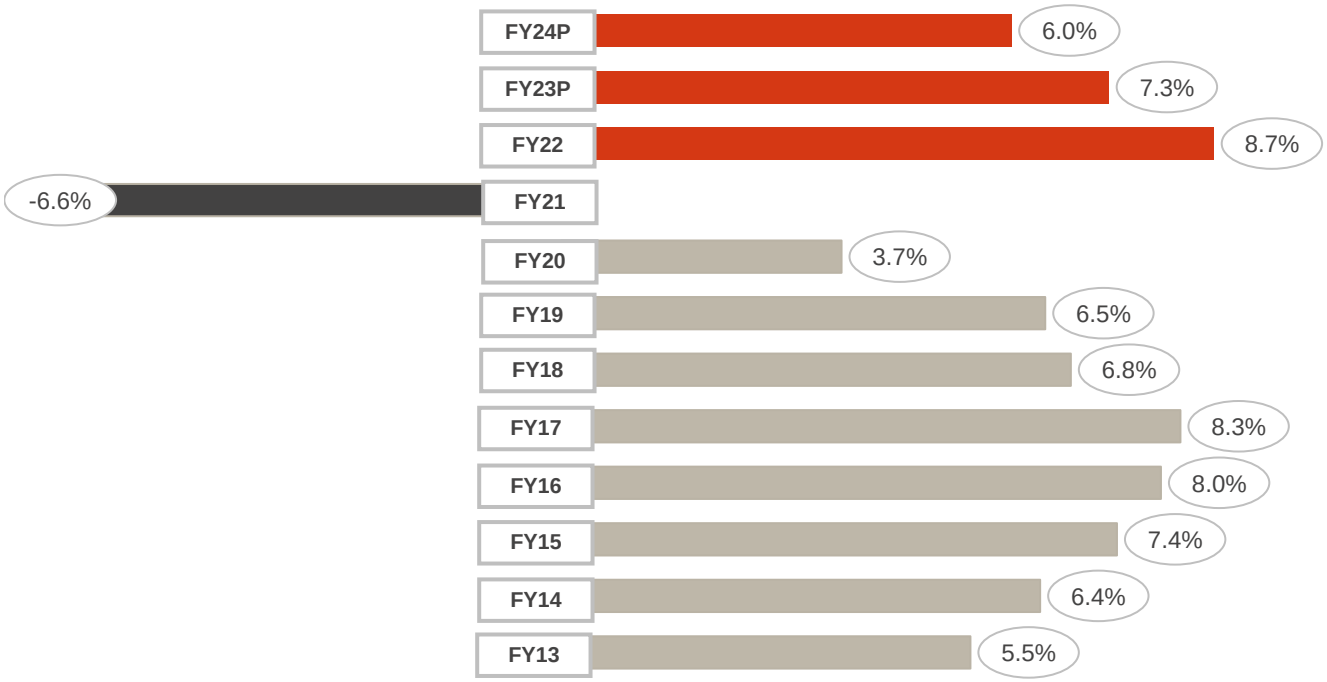
Source: CRISIL Research

Outlook for GDP growth in India

CRISIL estimates India's GDP growth at 7.3% in fiscal 2023 with downside risk

The growth outlook for fiscal 2023 is fettered by multiple risks. Global growth is projected to slow, as central banks in major economies withdraw easy monetary policies to tackle escalating inflation. This, together with high commodity prices, especially oil, translates into a negative terms of trade shock for India. At the same time, higher and broad-based inflation domestically will create a drag on consumption revival. Uncertainty due to the Russia-Ukraine conflict could put some of the private capex plans on hold. In fact, higher input prices could also result in lower government capex, which has already seen fiscal space shrink with attention shifting to relief measures, to fight rising inflation. Amid this gloomy scenario, the forecast of a normal monsoon2 comes as a silver lining. We also expect the gaining momentum in contact-intensive services to broad-base and support growth. On balance, CRISIL maintains its real GDP growth projection for fiscal 2023 at 7.3%, with risks tilted to the downside.

Real GDP growth (% on-year)



P- Projected by CRISIL Research.

Source: Advanced estimates of national income 2020-21, CSO, MoSPI, CRISIL Research

India to surpass global GDP growth in next three fiscals

GDP growth rebounded to 8.7% fiscal 2022 on the back of a very weak base and the rising-global-tide effect

India's GDP growth rebounded to 8.7% fiscal 2022 due to a very weak base, flattening of the Covid-19 curve, rollout of vaccinations, investment-focused government spending, and benefit from the 'rising-global- tide-lifts-all-boats' effect. Beyond fiscal 2022, India is seen growing faster than the world. Over fiscals 2023-24, growth is seen averaging at ~6.7% annually.

Note: Forecasts for world are given for calendar year, so FY20 corresponds to 2019 and so on; P- Projected; India numbers for FY20,FY21 and FY22 are based on MoSPI's latest GDP estimates and FY23 onwards are CRISIL Research's forecast. World GDP growth rates are from IMF world economic outlook update as of April 2022.

Source: MOSPI, CRISIL Research

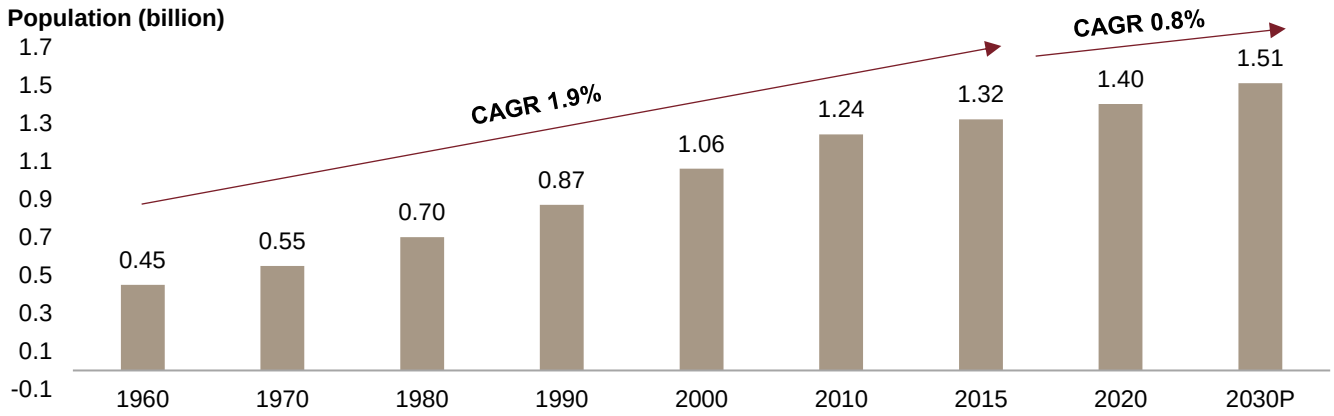
Fundamental growth drivers of GDP

India's population is projected at 1.5 billion by 2030

India's population increased at a CAGR of 1.9% during 2001-2011 to ~1.2 billion according to Census 2011. As of 2010 census, the country had about 246 million households.

According to the UN's report, World Urbanization Prospects, 2022 revision, India, and China, two of the most populous countries, accounted for nearly 36% of the world's population in 2021. The report projects India's population to increase at a CAGR of 0.8% from 2020 to 2030 to reach 1.5 billion by 2030, making it the world's most populous country, surpassing China (for which the projected population is 1.4 billion).

India's population growth



P- Projected

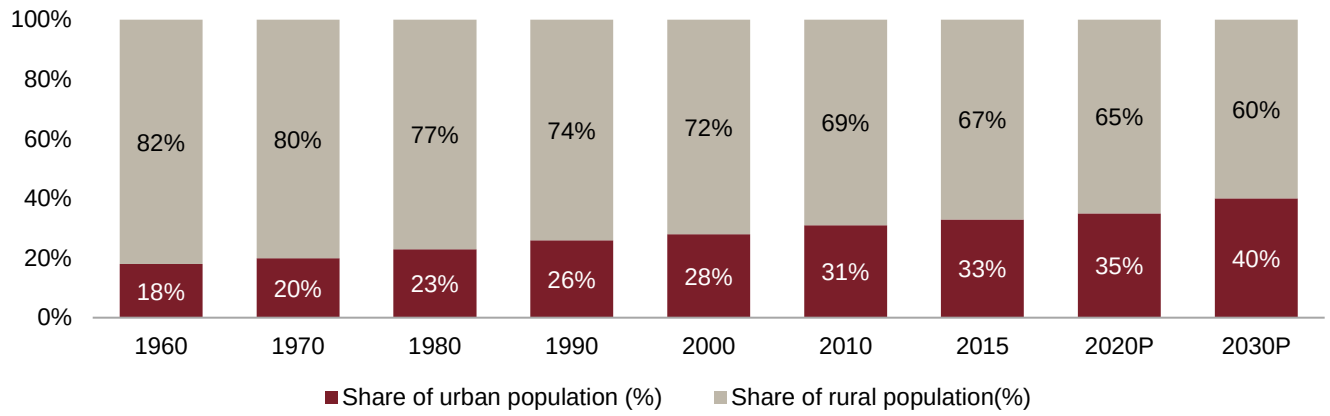
Source: United Nations, Department of Economic and Social Affairs, World Population Prospects 2022, CRISIL Research

Urbanisation to reach ~40% by 2030

India's urban population has been rising over the years and stood at ~31% of total population in 2010. The rising trend 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.

India's urban vs. rural population



P- Projected
Source: World Urbanization Prospects: The 2018 Revision, United Nations; CRISIL Research

India's population median age to reach 30.9 years by 2030

According to the UN, the global median age rose to ~30 years in 2020 from ~20 years in 1970. The median ages in developed countries exceeded the global median age significantly, as is evident from the median ages in the US and the UK, which were 37.5 years and 39.5 years, respectively. Interestingly, India's median age was lower at 27.3 years, indicating a favourable demographic dividend. Furthermore, India's median age was the lowest even among Brazil, Russia, India, and China (BRIC), with Brazil, China and Russia recording median ages of 32.4 years, 37.4 years, and 38.6 years, respectively.

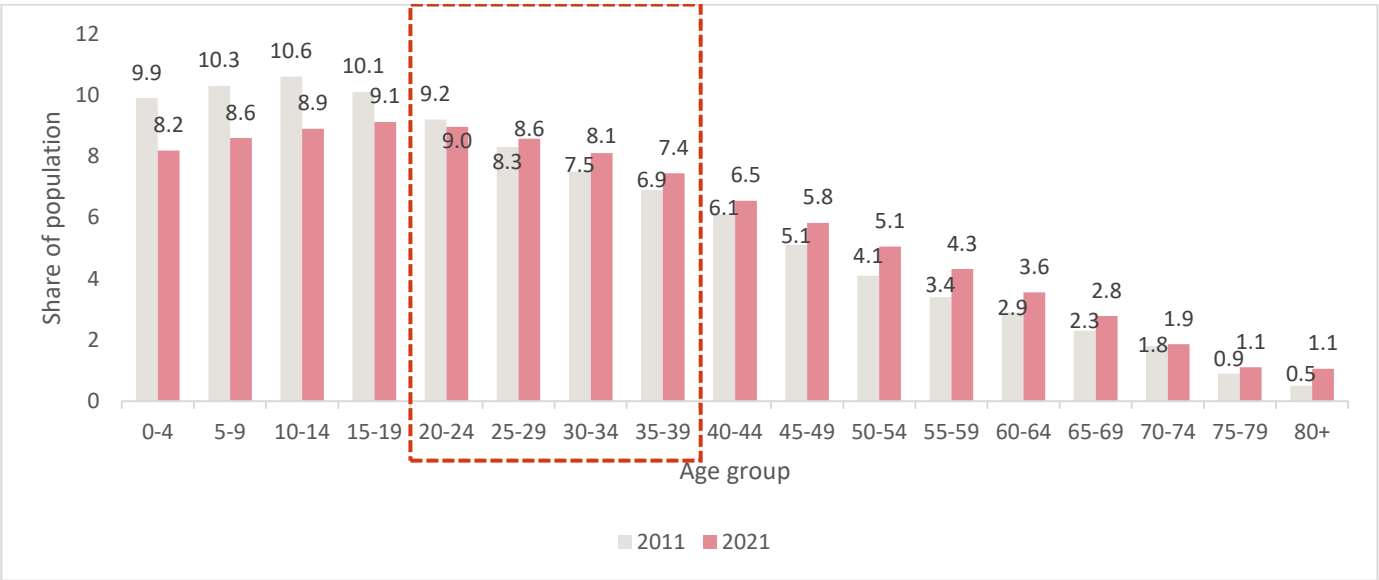
This trend is expected to continue up to 2030, implying strong potential for an increase in income, and basic and healthcare spending, with a growing proportion of the population engaging in employment activities.

Trend in median ages across key countries

Country	1970	1990	2010	2015	2020	2030P
Brazil	17.3	21.5	28.2	30.3	32.4	36.5
China	18.0	23.7	34.1	35.6	37.4	42.7
India	18.3	20.0	24.0	25.5	27.3	30.9
Russian Federation	29.7	32.2	36.9	37.6	38.6	42.1
UK	33.2	34.8	38.5	39.0	39.5	41.6
US	27.2	31.8	36.1	36.6	37.5	39.7
World	20.3	23.0	27.3	28.5	29.7	32.1

Source: United Nations, Department of Economic and Social Affairs, Population Division (2022); World Population Prospects 2022, CRISIL Research

~33% of the Indian population is in the 20-39 years age group



Source: Census 2011, UN World Population Prospects 2022, CRISIL Research

Census 2011 found India's population at 1.2 billion. Of this, ~51% was male, and ~49% female. About half of the population was in the 20-60 age bracket. Of this, ~32% population was 20-39 years old, and according to World Population Prospects 2022, this proportion is ~33% by 2021.

India's youth to account for ~39% of its population by 2030

As per the United Nations' 2022 Revision of World Population Prospects, India's youth (0-24 years) accounted for nearly half its population in 2010, significantly higher than that for some of its peers (Brazil at 42.5%, China at 35.1% and the Russian Federation at 29.7%). The fact that ~31% of the population is aged below 15 indicates the high proportion of country's young population is expected to remain so in the coming years.

This share is, in fact, expected to reach ~39% by 2030, and remain significantly higher than that of its peers (Brazil at 31.5%, China at 25.4% and the Russian Federation at 27.7%). This also indicates higher proportion of population entering the workforce.

Age-wise population break-up (%) for key countries

Country	0-14 years	15-24 years	25-49 years	50-69 years	70+	Total
Brazil						
2010	24.8%	17.7%	37.6%	15.6%	4.4%	100%
2020	20.8%	15.6%	38.3%	19.5%	5.8%	100%
2030P	18.2%	13.3%	37.4%	22.6%	8.4%	100%
China						
2010	18.5%	16.6%	40.3%	19.0%	5.7%	100%
2020	18.0%	11.4%	37.6%	25.5%	7.5%	100%
2030P	13.1%	12.3%	34.0%	28.6%	12.0%	100%
India						

Country	0-14 years	15-24 years	25-49 years	50-69 years	70+	Total
2010	31.0%	19.1%	33.9%	12.9%	3.1%	100%
2020	26.1%	18.2%	36.2%	15.5%	3.9%	100%
2030P	22.3%	16.2%	38.0%	17.9%	5.5%	100%
Russian Federation						
2010	15.2%	14.6%	37.2%	23.2%	9.8%	100%
2020	17.7%	9.8%	37.4%	25.5%	9.7%	100%
2030P	15.4%	12.4%	33.8%	25.2%	13.3%	100%
UK						
2010	17.6%	13.1%	34.8%	22.9%	11.6%	100%
2020	17.8%	11.6%	32.5%	24.4%	13.7%	100%
2030P	15.4%	12.2%	31.9%	24.5%	15.9%	100%
US						
2010	19.9%	14.1%	34.1%	22.8%	9.1%	100%
2020	18.5%	13.1%	33.0%	24.7%	10.7%	100%
2030P	16.4%	12.5%	33.2%	23.0%	14.8%	100%

P- Projected Source: United Nations, Department of Economic and Social Affairs, Population Division (2022); World Population Prospects 2022, CRISIL Research

Review of per capita income growth

India's per capita income rose at a healthy pace between fiscals 2012 and 2020

India's per capita income, a broad indicator of living standards, rose from Rs 63,462 in fiscal 2012 to Rs 94,556 in fiscal 2020, or at 5.1% CAGR. This growth was led by better job opportunities, propped up by overall GDP growth. Moreover, population growth remained stable at ~1% CAGR. However per capita income declined in fiscal 2021 owing to economic impact of Covid-19, per capita income declined by 9.7% on-year in fiscal 2021. The per capita income saw rise in fiscal 2022 growing at 7.5% on-year, but in absolute terms it is yet to recover to pre-pandemic levels.

Per capita net national income at constant prices

	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20 (2nd RE)	FY21 (1st RE)	FY22 (PE)
Per-capita net national income (Rs)	63,462	65,538	68,572	72,805	77,659	83,003	87,586	92,241	94,270	85,110	91,481
On-year growth (%)		3.3	4.6	6.2	6.7	6.9	5.5	5.3	2.2	-9.7	7.5

RE: Revised estimates; PE: Provisional estimates

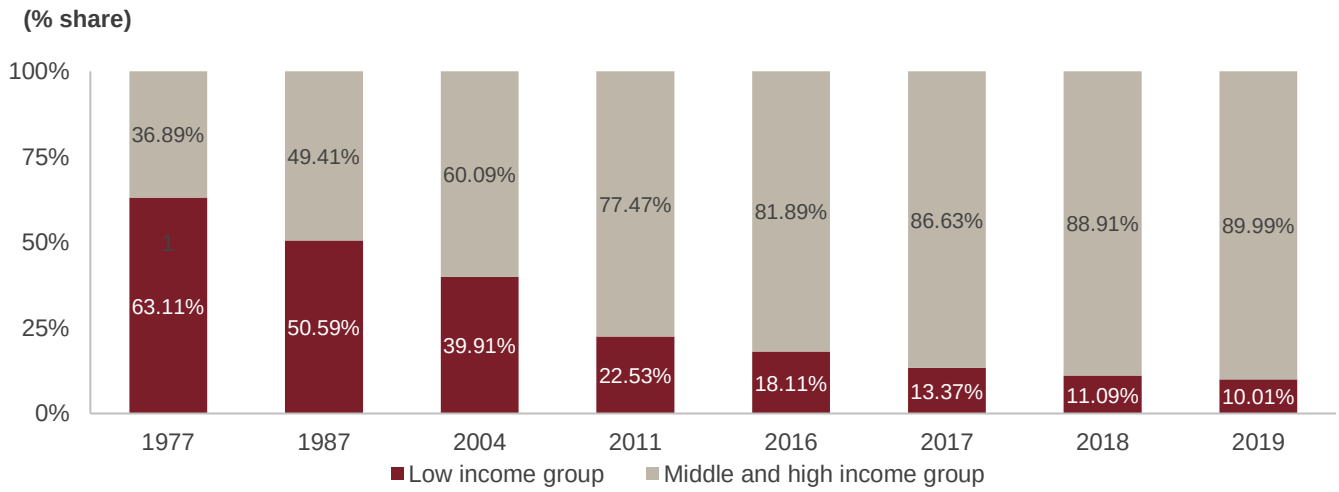
Source: Second Advance Estimates of Annual National Income, 2020-21, CSO, MoSPI, CRISIL Research

The decline in poverty levels indicates rise in middle- and high-income group in India

According to the World Bank's Poverty and Inequality Platform (PIP), the number of poor (defined as those living at or below the international poverty line of purchasing power parity 2017 of $2.15 per day) in India declined to 136.8 million in 2019 from 411.8 million in 1977. In percentage terms, the share of poor in India's total population declined to 10.01% from 63.11% over the period. The decline in poverty has been attributed to improvement in macroeconomic parameters (such as economic growth, employment, and income equality) and adoption of employment and other public welfare schemes by the government.

The decline in poor population indicates that middle- and high-income groups in India have grown at a fast clip, from 36.89% in 1977 to 89.99% in 2019.

Broad split of population into income groups



Source: World Bank, CRISIL Research

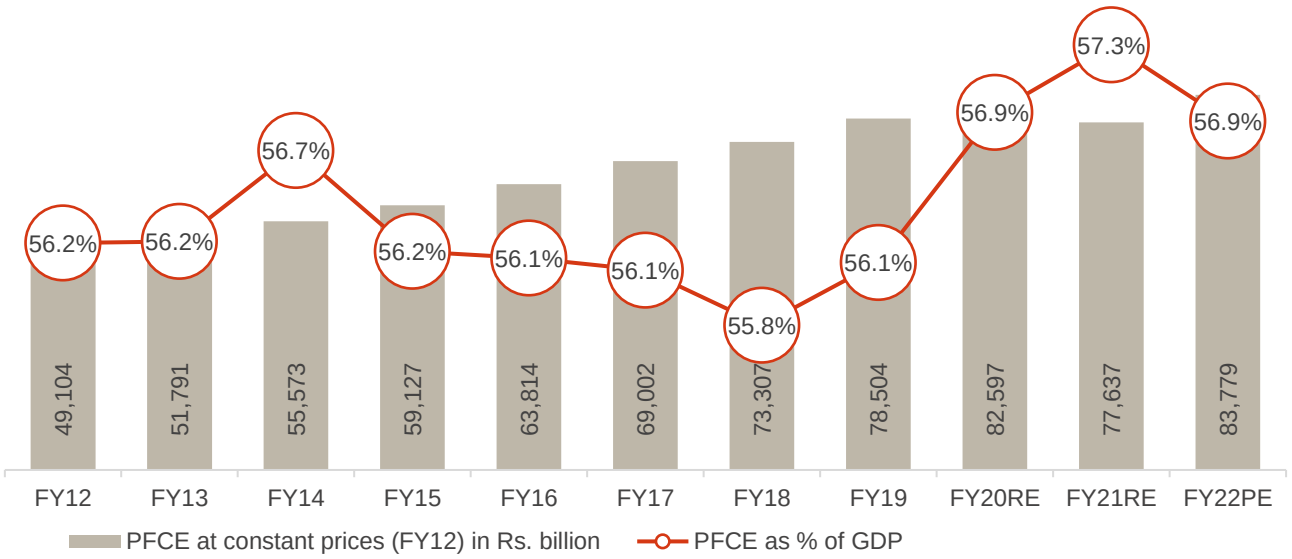
Review of private final consumption expenditure (PFCE)

Private final consumption expenditure to maintain dominant share in GDP

Private final consumption expenditure (PFCE) at constant prices clocked 6.7% CAGR between fiscals 2012 and 2020, maintaining its dominant share in the GDP pie, at ~57% or Rs 82,597 billion. Factors contributing to the growth included good monsoons, wage revisions due to the implementation of the Pay Commission's recommendations, benign interest rates, and low inflation. PFCE, however, declined in fiscal 2021 to Rs 77,637 billion on account of the pandemic, when consumption demand was impacted on account of strict lockdowns, employment loss, limited discretionary spending, and disruption in demand-supply dynamics. PFCE increased by 7.9% to Rs. 83,779 billion in fiscal 2022, but as % of GDP remained low at 56.9% as personal expenditure had negative impact of COVID-19 pandemic and Government spending expenditure saw an increase for boosting the economy from COVID-19 slump.

Going forward, CRISIL forecasts PFCE to grow at 6-8% CAGR between fiscals 2021 and 2024.

PFCE (at constant prices)



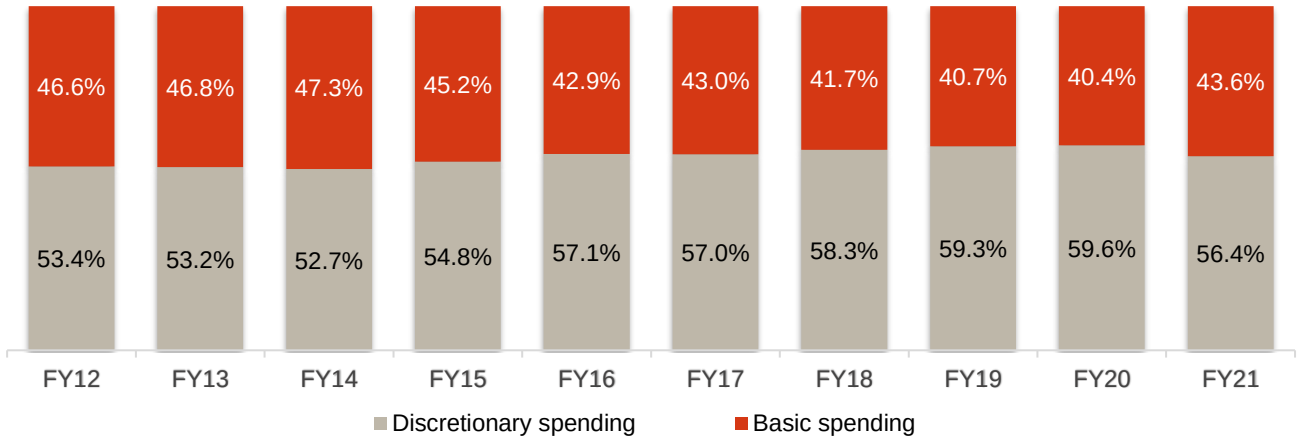
Note: RE - Revised estimate PE – Provisional estimate

Source: MoSPI, CRISIL Research

Consumption expenditure to be driven by discretionary items

Basic items accounted for 40.4% of the total consumption expenditure of Indians in fiscal 2020, with discretionary items accounting for the remainder 59.6%. The share of basic items increased in fiscal 2021 to 43.6% as pandemic decreased the expenditure on discretionary items. It is worth noting that the share of discretionary items in consumption increased to 59.6% in fiscal 2020 from 53.4% in fiscal 2012. The increased spending on discretionary items suggests rising disposable income of households.

Broad split of PFCE into basic and discretionary spending

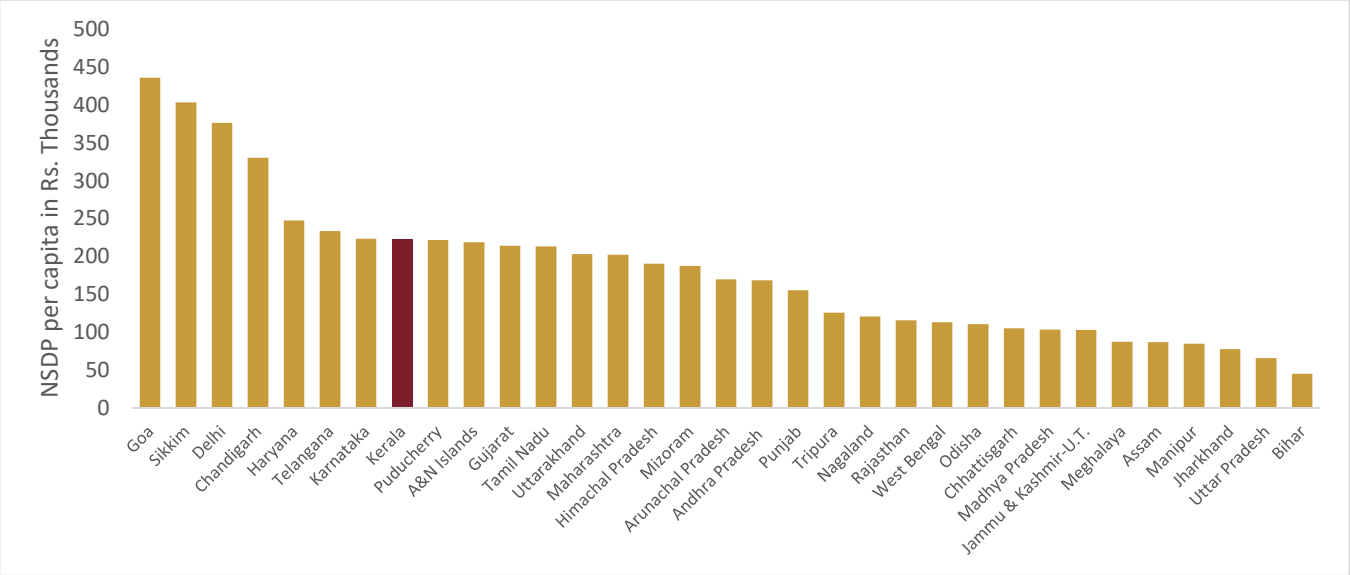


Note: Basic items include food, clothing and housing. Discretionary items include education, healthcare, electricity, water supply, footwear, personal care products, processed foods, alcoholic and non-alcoholic beverages, tobacco, narcotics, fuel & gas, furnishing and household equipment, vehicle and personal transportation, spending on recreation and culture, communication (includes postal and telephone and telegraph services), restaurants and hotels, financial insurance and other financial services, and other items not classified elsewhere.

Source: MoSPI, CRISIL Research

Kerala is among the top 10 states in India in terms of per capita income

Per capita NSDP - current prices (in Rs.) – Fiscal 2020



Source: MOSPI, CRISIL Research

Key state wise macroeconomic parameters

States	GSDP At constant prices^ (Rs. Billion)	GSDP growth (FY17-FY20)	Per capita NSDP (Rs) at current prices^	Poverty Rate (%)^^	Unemployment rate Rural# (per '000)	Unemployment rate Urban# (per '000)
Maharashtra	21,341	5.7%	202,130	17.4	42	64
Andhra Pradesh	6,688	7.4%	168,480	9.2	45	73
Madhya Pradesh	5,804	7.2%	103,288	31.7	24	74
Tamil Nadu	12,786	7.2%	213,396	11.3	64	67
Karnataka	11,438	6.7%	223,175	20.9	27	52
Odisha	4,124	6.9%	110,434	32.6	61	127
Kerala	5,686	5.4%	221,904	7.1	84	97
India	**146,692**	**5.8%**	**134,186**	**21.9**	**50**	**77**

Note: NA - Not available; GSDP-Gross State Domestic Product; NSDP- Net state domestic product
^Figures mentioned are for FY20,^^Data for FY12 as per latest consumer spending National Sample Survey Office (NSSO) survey
#-Data for FY19, according to Handbook of Statistics on Indian States published by RBI in October 2020
Source: RBI, CRISIL Research

States	Population (million)*	Share of Urban population*	Literacy (%)*	Life Expectancy**	Child mortality (per 1,000 live births) **
Maharashtra	112.4	45.2%	82.9	72.5	23.2
Andhra Pradesh	84.6	33.3%	67.0	70.0	30.3
Madhya Pradesh	72.6	27.5%	69.3	66.5	41.3
Tamil Nadu	72.1	48.5%	80.1	72.1	18.6

Karnataka	61.1	38.8%	75.4	69.4	25.4
Odisha	42	16.7%	72.9	69.3	36.3
Kerala	33.4	47.9%	94.0	75.3	4.4
India	**1210.8**	**31.1%**	**73.0**	**69.4**	**35.2**

*Note: NA - Not available; GSDP-Gross State Domestic Product *According to 2011 Census, according to Handbook of Statistics on Indian States published by RBI in November 2021 ,**-Figures for the year 2020-21 as per NHFS-5*

Colour Index: Green – Positive/ higher performance as compared to national average Orange – Negative / lower performance as compared to national average

Source: RBI, CRISIL Research

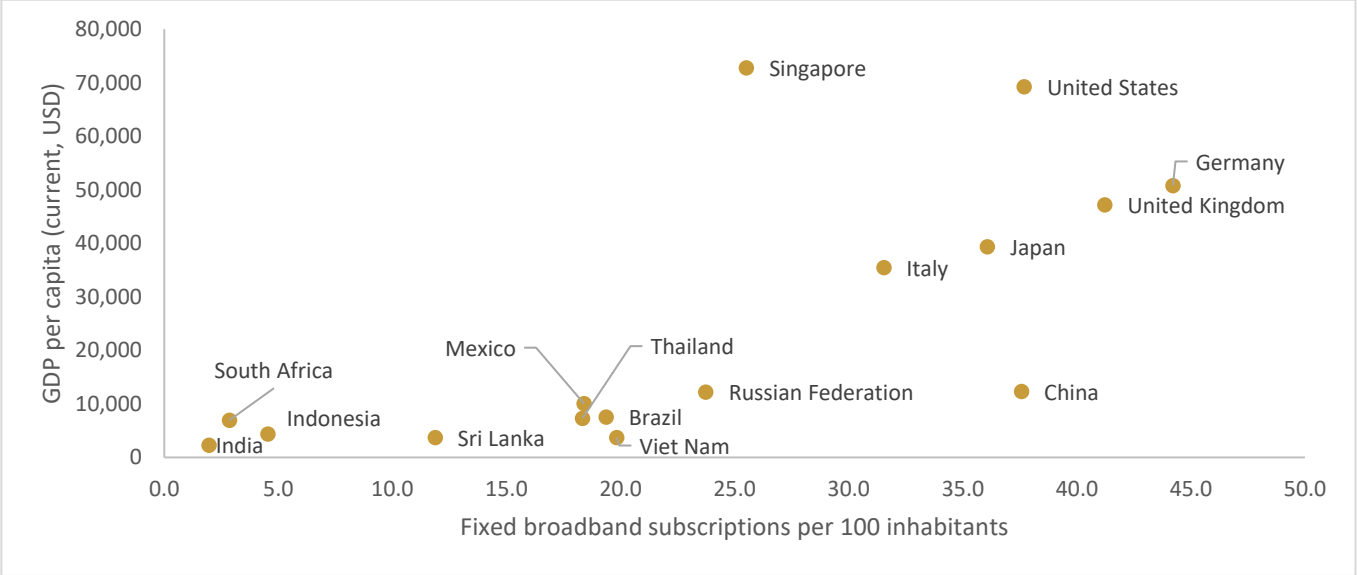
Key observations

- Amongst the states in India, Kerala has the highest literacy rate of 94% according to the 2011 Census
- State of Kerala had 47.9% of its population living in urban areas as compared to 31.1% for national average according to census 2011. In India nearly 35% of the population lives in urban areas as of year 2020
- Karnataka has the highest per capital Net State Domestic Product (NSDP) amongst the states considered above followed by Kerala with NSDP of Rs.223,175 and Rs.221,904 respectively as of fiscal 2020
- Kerala is ranked 8th among all states in India in terms of per capita net domestic income in fiscal 2020
- Kerala has the lowest poverty rate among the states considered above with 7.1% as poverty rate well below the national average of 21.9% as reported in fiscal 2012 national consumption and expenditure survey
- Kerala reported the highest life expectancy rate amongst the states considered above with life expectancy of 75.3 years as compared to national average of 69.4 years between 2014 and 2018
- Kerala has lowest rate of infant mortality amongst the states considered above with the rate of 4.4 mortalities per 1000 alive children during 2020-2021 as per NHFS-5 survey data as compared to national average of 35.2 mortalities per 1000 alive children

India has one of the lowest fixed broadband penetrations as compared to other developed and developing economies

India reports a fixed broadband penetration of 2 connections per 100 population which is far lesser than fixed broadband penetration of many developing and developed nations. Kerala state with comparative higher per capita income than Indian average has higher fixed broadband penetration of 4.4 connections per 100 population.

Fixed Broadband penetration (2021)



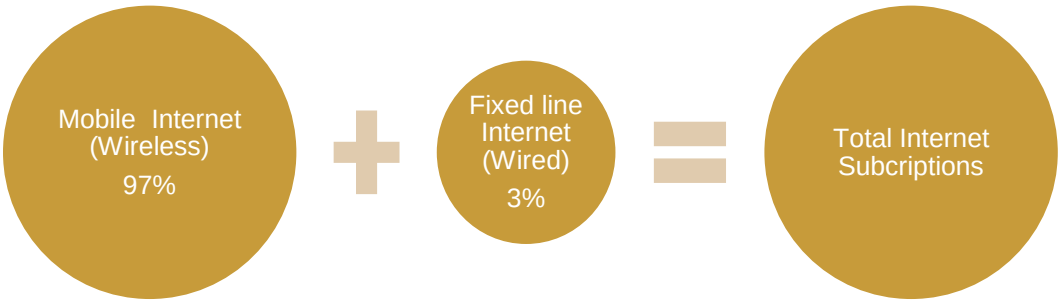
Source: IMF, ITU, CRISIL Research

3 Overview of the broadband industry in India

Introduction to broadband internet

Internet has played a very significant role in technological advancements across the globe. With the advent of internet there has been ease of access to the various technologies and processes. Adoption of internet has been significant over the years and consumers access internet through various means and technologies. Mobile internet and fixed line internet are two of the major ways in which internet consumer access internet. Mobile internet includes accessing internet through mobile devices such as smartphone and dongle whereas fixed line internet provides access to internet through a fixed connection by means of copper cable or optic fiber.

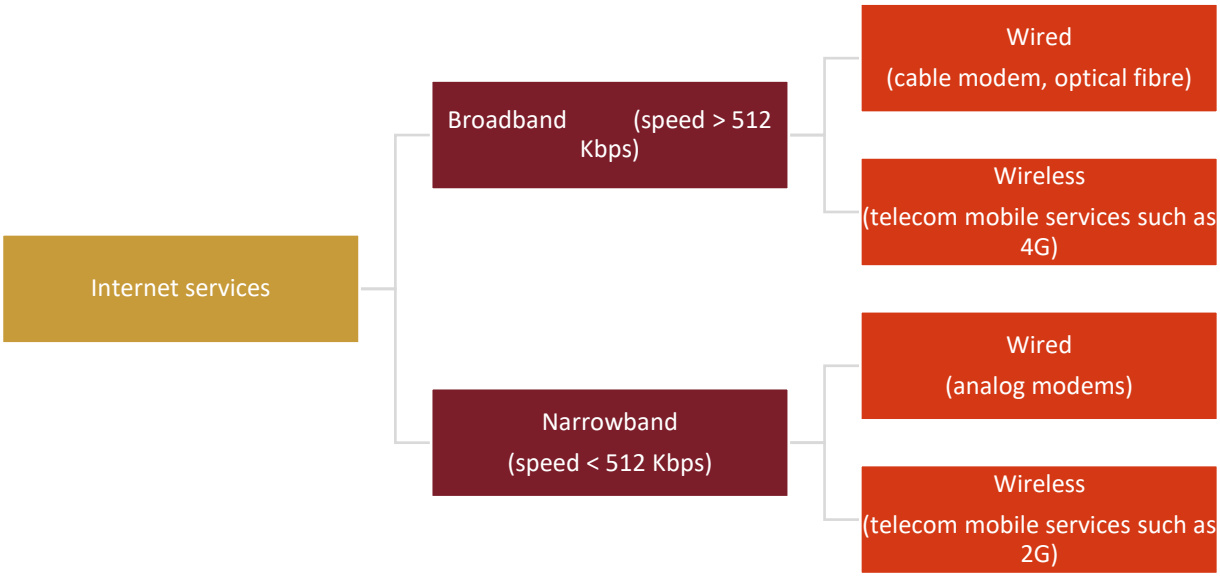
Type of Internet subscribers



Note: % values indicate the share in total internet subscription in India as of fiscal 2022
Source: CRISIL Research

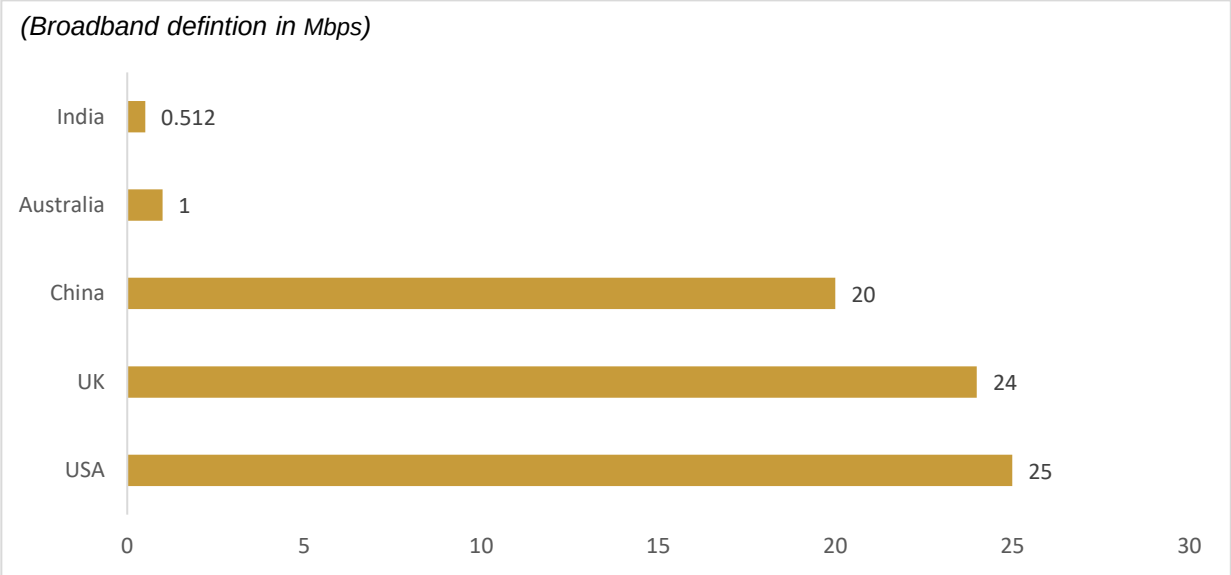
Broadband commonly refers to internet access through a variety of high-speed wired and wireless networks, including DOCSIS, DSL, FiOS, Wi-Fi, WiMAX, 3G, 4G and satellite, all of which are faster than earlier analog dial-up. According to TRAI (Telecom Regulatory Authority of India) in India, broadband is defined as a data connection that is able to support interactive services including internet access and has the capability of minimum download speed of 512 kbps to an individual subscriber from the point of presence (POP) of the service provider intending to provide the broadband service. Broadband technology enables communication of information through voice and data by utilising a wide range of devices and network systems.

Brief overview of the internet services in India



Source: CRISIL Research

India's broadband speed definitions is lower than other major countries



Source: CRISIL Research

Mobile broadband

Also referred to as a mobile or cellular telecom network, this type of connection utilises cell towers to transfer a signal. The network is made up of cells that connect to one another and to telephone switches or exchanges. These cells are typically hexagonal, have at least one transceiver, and use various radio frequencies. The transceivers are the cell towers and connect to each other to hand off packets of signals — data, voice, and text — ultimately bringing these signals to mobile devices such as phones and tablets that act as receivers. Providers use each other's towers in many areas, creating a complex web that offers the widest possible network coverage to subscribers.

Wired broadband

Wired refers to any physical medium consisting of cables. The cables can be copper wire, twisted pair, or fibre optic. A wired network is used to carry different forms of electrical signals from one end to the other. Mostly, in such networks, one internet connection is taken using a line or cable modem. This connection is shared among multiple devices using a wired network concept. Wired broadband has high reliability, as the signal is directly conveyed through a manufactured cable. However, wired network installation is cumbersome and requires more time and infrastructure. Wired broadband coverage can be limited as it must operate in an area covered by a connected wired system. That said, wired broadband speeds can dwarf wireless broadband speeds. A wired network can support speeds up to 10 Gbps (gigabits per second), while a wireless network can support speeds of over 800 Mbps (megabits per second).

Average data usage for fixed line broadband in India is 13-15 times higher than wireless/mobile data usage

India has seen growing demand for fixed broadband connections in recent years owing to higher speeds offered by the fixed broadband services as well a reliable connection in terms of fiber connectivity. In India as of March 2022 the average data consumption for wired broadband was over 180 GB/user/month as compared to ~16 GB/user/month of average wireless data consumption. The fixed broadband data consumption is around ~13-15 times that of average wireless data consumption. Also, fixed broadband connections offer superior speeds than the wireless broadband. Median speed registered in India for fixed broadband was around 48.0 Mbps compared to 13.4 Mbps registered by wireless broadband connections as per Ookla performance index, July 2022. Covid-19 have pushed the increased usage of fixed broadband connections due to remote work and at home education. Also, with advent of higher video and music consumption through OTT platforms there has been more demand for high-speed internet. In the long term, we expect the wired-broadband subscriber base addition to sustain even after the pandemic is contained, as private players continue to expand home passes, given the increase in last-mile fibre-connectivity investments undertaken amid the pandemic.

Snapshot of comparison of Wired and Wireless broadband services in India

	Wireless broadband	Wired Broadband
Median Speed	13.4 Mbps	48.0 Mbps (3.6x times wireless speed)
Average data usage*	16 GB/User/month	180+ GB/User/month
Major Applications	General Browsing and Email, social media, File Downloading	Telecommuting, Streaming Ultra HD 4K Video, HD Video Teleconferencing
Average data value as % of GNI	1.10%	3.32%
Data value pack	1.0x	2.0-2.5x

*Note: *-Estimated value for fiscal 2022*

Source: TRAI, ITU price basket 2021, Ookla speed test global index July 2022 report, CRISIL Research

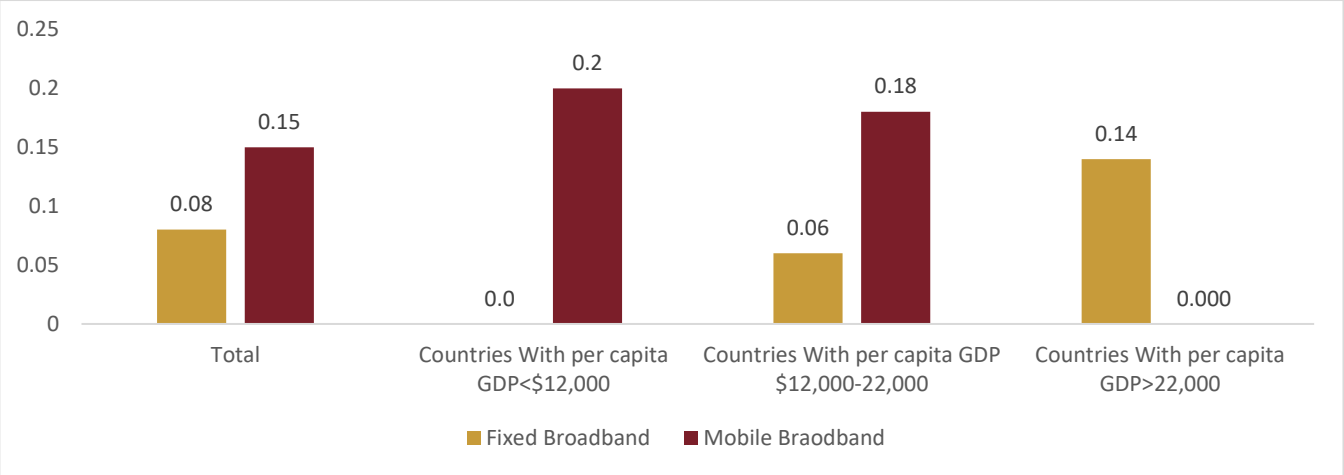
Wireless broadband

Wireless refers to a medium made of electromagnetic waves or infrared waves. These radio frequency waves include microwaves. All of the wireless devices will have antenna or sensors and as so named, do not use wires for data or voice communication. Typical wireless devices include cellular mobile, wireless sensors, TV remotes, satellite disc receivers and laptops with a WLAN card. While wireless broadband can span more areas than a wired network, a wireless network can experience weakened or blocked signals. In particular, among the causes for cell signal blockage are: the distance a device is from the nearest cell tower, local terrain obstructions such as hills and mountains, man-made obstructions such as a highway overpass or large building, and vegetation. Fixed wireless is an expanding practice. This approach involves connecting existing fibre, cable, or DSL internet between two fixed locations via a radio and a receiver. Fixed wireless relies on small stations to transfer data at high speeds, similar to a satellite, but localized. Since the stations are clustered close together, the technology is capable of delivering faster internet speed with lower latency. However, signals are generally transmitted via line-of-sight and avoiding signal obstructions is a challenge.

Fixed broadband impact on economic increases with rise in per capita GDP

As per the International Telecommunication Union (ITU), when the impact of mobile broadband and fixed broadband was studied the economic impact of fixed broadband is higher in developed countries than in developing economies. Whereas the economic impact of mobile broadband is higher in developing countries than in developed countries

Economic impact of broadband worldwide, 2010-2017



Note: Values expressed as impact on GDP of 1 per cent increase in broadband penetration.
Source: The economic contribution of broadband, digitization and ICT regulation, ITU research, CRISIL Research

Overview of ISP (Internet Service Providers) in India

In India, internet services are provided not only by pure play internet service operators, but also by players in television and internet services as well as telecom companies. These players usually offer both narrowband and broadband services. Telecom companies such as Reliance Jio, Airtel and Vodafone-Idea have majority of the subscribers in wireless internet services; whereas cable TV operators and pure internet service providers such as Hathway and Asianet have majority subscribers in the fixed or wired internet services. With growing penetration of

internet in the country, services offered by ISPs have seen rapid change and customisation. Players are offering bundled services; for instance, cable TV and broadband services are bundled together. Similarly, telecom operators bundle voice and internet services.

Technologies in wireline internet services in India

Digital Subscriber Line (DSL)

The DSL technology uses special hardware that enables transfer of data and information at high speeds, as compared with conventional copper wireline phones. DSL utilises different frequencies to split voice and data services over the same standard phone line, since phone networks only use a small portion of the available bandwidth for voice traffic. DSL speeds are influenced by the distance between the subscriber and the local exchange (the distance should ideally not be more than 3-5 km), the gauge of the copper phone wire, and the type of DSL technology used.

There are four types of DSL technology namely:

- **Asymmetric digital subscriber line (ADSL):** Service providers in India, such as Bharat Sanchar Nigam Ltd ("BSNL"), MTNL and Bharti Airtel, provide broadband through the ADSL technology. ADSL technology is ideal for web browsing and typical internet usage (downloading of large files, video on demand, video streaming, audio streaming, etc). It is the most commonly installed DSL technology. However, this technology is not suited for business uses such as hosting web or e-mail servers
- **Very high data rate digital subscriber line (VDSL):** This is the latest form of DSL technology and can offer speeds of up to 52 Mbps over shorter distances. VDSL is capable of supporting applications such as high-definition television, as well as telephone services (voice over IP) and general internet access, over a single connection. It is the next commonly-used technology after ADSL
- **Single-pair high-speed digital subscriber line (SHDSL):** In this technology, a copper pair is used to send and receive data through two bands, allowing for speeds up to 2.3 Mbps (downstream as well as upstream). SHDSL connections are best suited for servers and other business uses
- **Symmetric digital subscriber line (SDSL):** Mainly used in North America, SDSL offers equivalent traffic flow in each direction, and like SHDSL, cannot share the line with analogue signals. SDSL can deliver data at speeds up to 1.5 Mbps. This service is ideal for business applications that would otherwise have been served through leased lines.

Cable modem

The cable modem technology, also called data over cable service interface specification (DOCSIS), has evolved making it possible to provide broadband services at speeds of speeds of normally up to 50 Mbps. In a cable broadband network, the signal is transmitted from the main operations centre of the service provider (known as head-end) in a star-like fashion to the fibre nodes using optic fibre feeders. The fibre node, in turn, distributes the signals over coaxial cables, amplifiers, and hubs throughout the customer service area. The size of this area varies between 500 and 2,000 home networks. Cable modems are widely used across India, with people opting for internet connectivity from the same operator who provides TV cable connection.

Fibre optics

The biggest advantage of fibre optics-based broadband networks is their enormous bandwidth potential. But they come at a high capital cost. Fibre optic networks are typically laid down only in big cities with a high density of population and significant revenue-generating potential given their high capital expenditure commitment required. In the US, companies such as Verizon and SBC Communications are deploying fibre-to-the-curb (FTTC) and fibre-to-the-home (FTTH) networks, making use of fibre cabling into the last mile.

The extent of fibre optics used in India is currently evolving in cities and is low compared with the usage of other technologies. However, demand for this technology is expected to increase in future with the launch of the National Optical Fibre Network (NOFN) project in 2011.

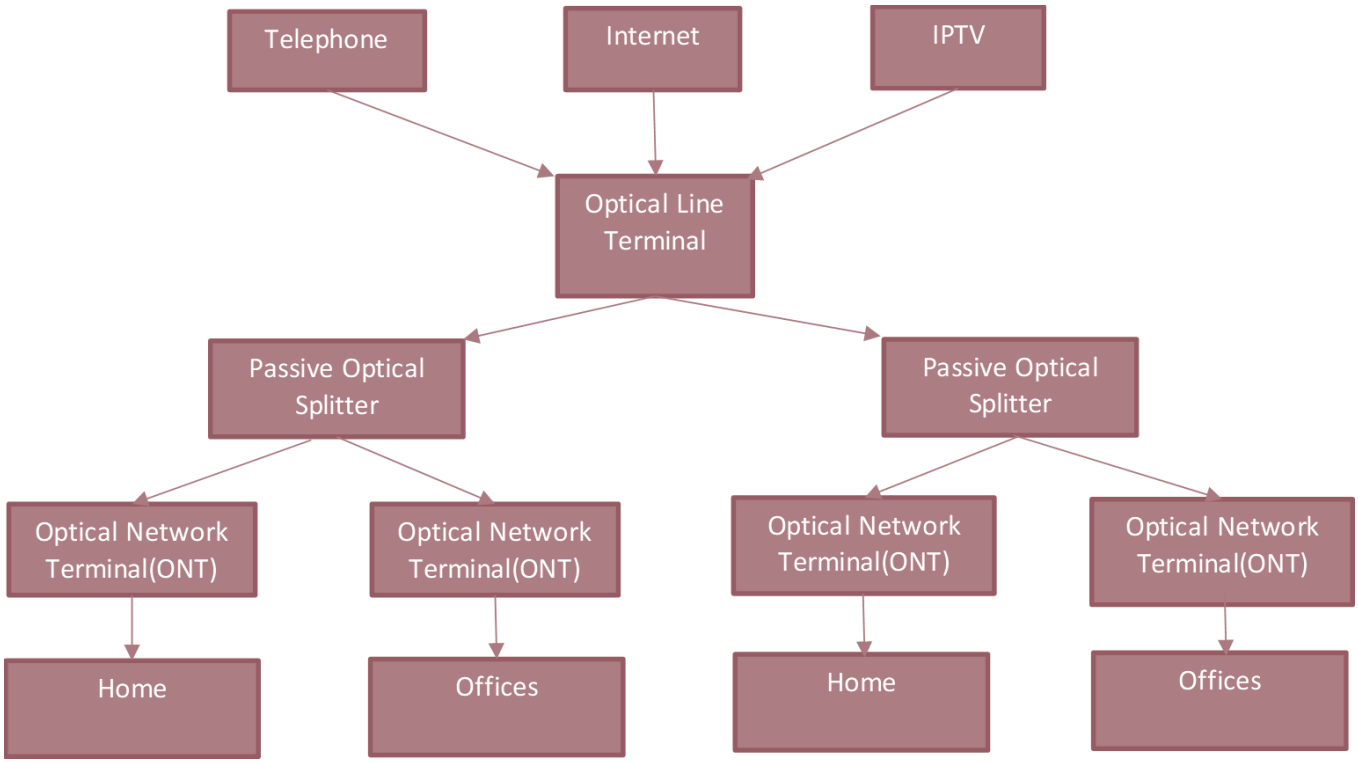
Gigabit passive optical networking (GPON) and ethernet passive optical networking (EPON) are variations of the passive optical networking (PON) technology, or FTTH networks being deployed by internet service providers. EPON uses ethernet packets instead of asynchronous transfer mode, or ATM, cells. EPON also uses internet protocol (IP) to carry data, voice, and video data. It generally delivers 1G symmetrical bandwidth, which makes it a popular choice.

GPON

GPON uses ATM for voice, Ethernet for data and proprietary encapsulation for voice. It offers faster speed than EPON on downstream and upstream bandwidths. Optical fibre is the globally preferred technology to provide high-speed broadband to end users. Generally, it uses GPON technology for provisioning of broadband services through FTTH connectivity. Though considered a future-proof solution, it does require high initial investment in the last mile connectivity. GPON is an alternative to Ethernet switching in campus networking. It replaces the traditional three-tier Ethernet design with a two-tier optic network by substituting access and distribution Ethernet switches with passive optical devices.

GPON is a point-to-multipoint access network. It uses passive splitters in the fibre optic distribution network (ODN), which allows a single feeding fibre from the internet service provider (ISP) to serve several homes or businesses. This also reduces equipment, satisfying high density areas as well as supporting triple play service - voice, date and IP video. While Ethernet connections are only point-to-point, GPON’s clear advantage is it being point-to-multipoint as well as offering higher downstream speed than EPON.

Typical GPON network



Source: CRISIL Research

GPON is based on a standard for new generation of broadband passive optical access. It is a widely deployed FTTH network and provides normally up to 1 Gbps speed.

Overview of key technologies

	GPON	DOCSIS	ADSL	VDSL
Speed	Normally up to 1 Gbps	Normally up to 50 Mbps	Normally up to 24 Mbps	Normally up to 250 Mbps
Efficiency range	10-60 km	2-100 km	5 km	1 km
Business application	Yes	No	No	No
Infrastructure architecture	Signal transmission via fibre; distribution of signals by electrically powered network equipment or unpowered optical splitters	Coaxial cable in the streets and buildings; fibre at the feeder segments	Internet access by transmitting digital data over the wires of a local telephone network copper line that terminates at a telephone exchange	Internet access by transmitting digital data over the wires of a local telephone network copper line that terminates at a street cabinet (VDSL). Vectoring allows elimination of cross talks for higher bandwidth
Characteristics	Highest bandwidth capacities, high efficiency range, high investment cost	Use of the existing cable TV infrastructure, fast to install, high transmission rates	Fast to install by using the existing telephone infrastructure	Fast to install by using the existing telephone infrastructure

Source: CRISIL Research

Integrated services digital network (ISDN)

ISDN refers to a collection of standards that define a digital architecture, which provides integrated voice and data capability to customer premises by utilising the public switched network. ISDN delivers internet connectivity at speeds ranging from 64 Kbps to 256 Kbps. Though highly robust, ISDN is a niche technology, mainly because it is not scalable and flexible. The number of ISDN lines has been declining, with corporates increasingly preferring lease line or broadband services.

ISDN is an important backup network for point-to-point leased line customers such as banks.

Technology in wired broadband internet services

Players	Technology used for broadband
Asianet	Asianet Broadband uses GPON technology for broadband while less than 5% subscribers on DOCSIS
Airtel	Offering broadband with both DOCSIS 3.1 (coaxial copper cable) and GPON (fiber-optic) technology. According to the company's December 2020 investor call transcript, Airtel is in the process of rapidly replacing its legacy copper assets completely with fiber. Airtel also uses DSL and VDSL technology to provide wireline internet service.
Den	Its fixed broadband infrastructure is built using a mix of GPON/FTTX and Metro Ethernet technologies, enabling download speeds from 20 Mbps till 1 Gbps.
Hathway	Uses a combination of DOCSIS 3.0 and 3.1 & GPON tech-based broadband with speed up to 1 Gbps
Jio	Provides GPON (fibre optic) tech-based broadband pan-India
SITI	Broadband through hybrid (DOCSIS 2/3 & GPON) network
VI	Uses a combination of DOCSIS 3.0/3.1 and GPON tech

Source: Company documents, news article, CRISIL Research

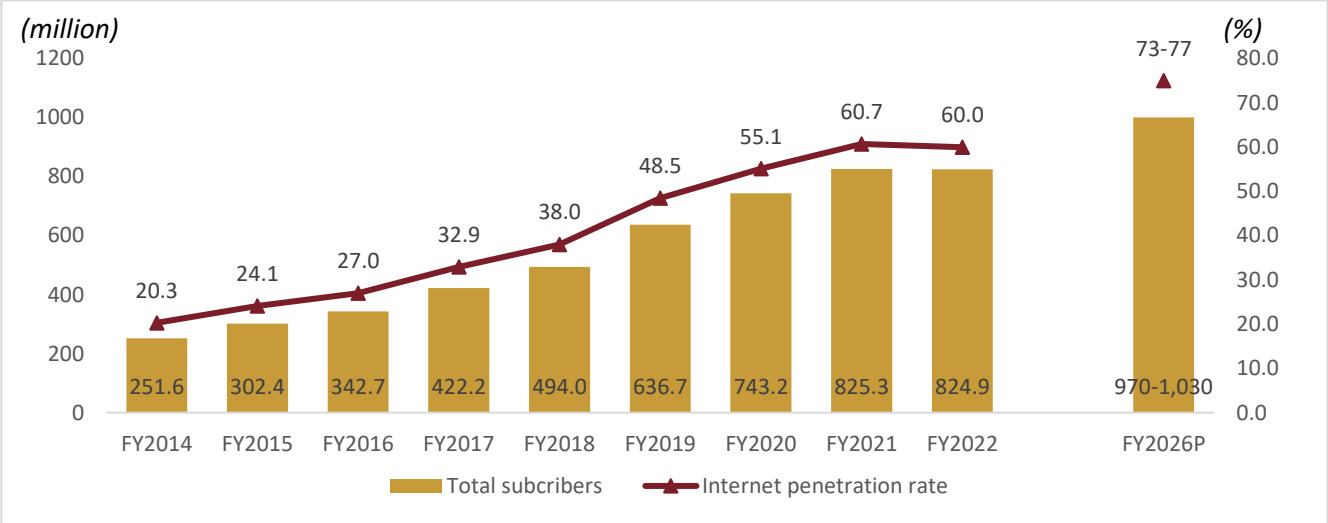
Broadband industry in India saw strong growth since 2014

Broadband is extremely essential for improving the socio-economic development by increased public participation in the digital ecosystem. For developing countries in the low- and middle-income brackets such as India, broadband can be a key driver of economic growth. The broadband subscriber base in India has been growing at an accelerated pace over the past 4-5 years.

Internet subscribers up at a CAGR of 16.0% between fiscals 2014 and 2022

Internet and broadband penetration in India has expanded at a rapid pace owing to digital connectivity by means of smartphones and other modes. Internet subscribers in India have increased from 251.6 million in fiscal 2014 to 824.9 million in fiscal 2022, at 16.0% CAGR. Going ahead total internet subscribers are expected to increase by 4-6% CAGR to reach 970-1,030 million by the year fiscal 2026

Total Internet subscribers in India

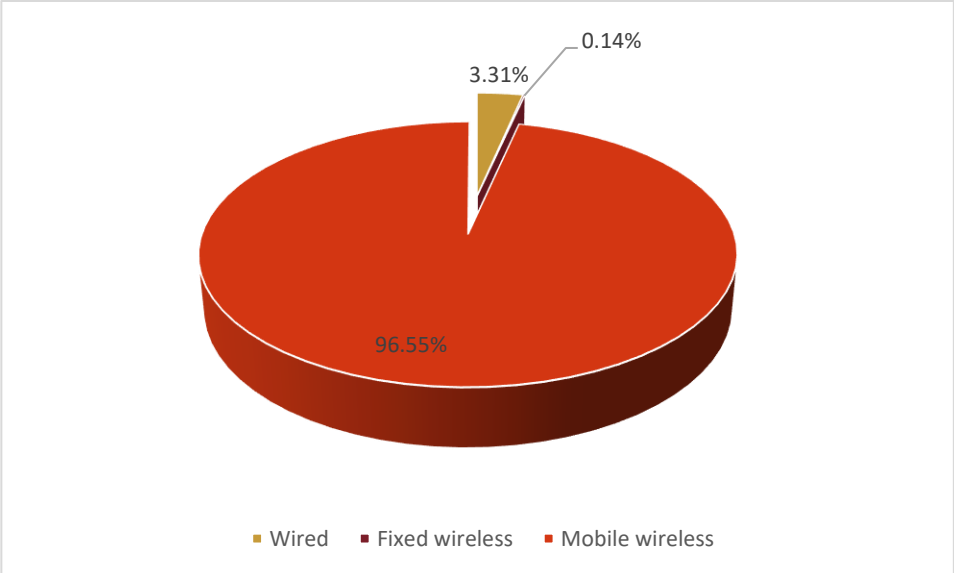


Note: Internet penetration is for per 100 population as per TRAI report

Source: TRAI, CRISIL Research

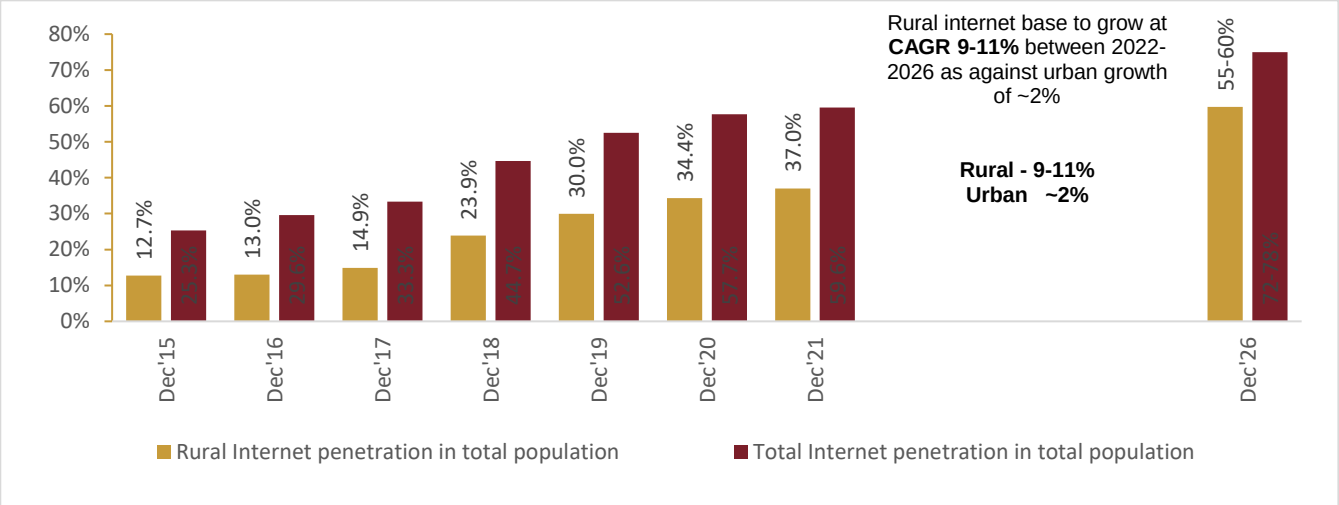
Internet penetration has significantly deepened in India over the past 6-7 years, driven by increase in the use of smartphones, ease of internet access in rural areas as well as cheaper data plans offered by ISPs. As per a TRAI report, internet penetration measured in terms of subscribers per 100 population trebled from 20.3 in fiscal 2014 to 60.7 in fiscal 2021. Going ahead, internet subscriber additions are expected to be to be driven by low rural teledensity which will take up the internet penetration in the country to 73-77% by fiscal 2026.

Composition of internet subscription as on March 31, 2022



Source: TRAI, CRISIL Research

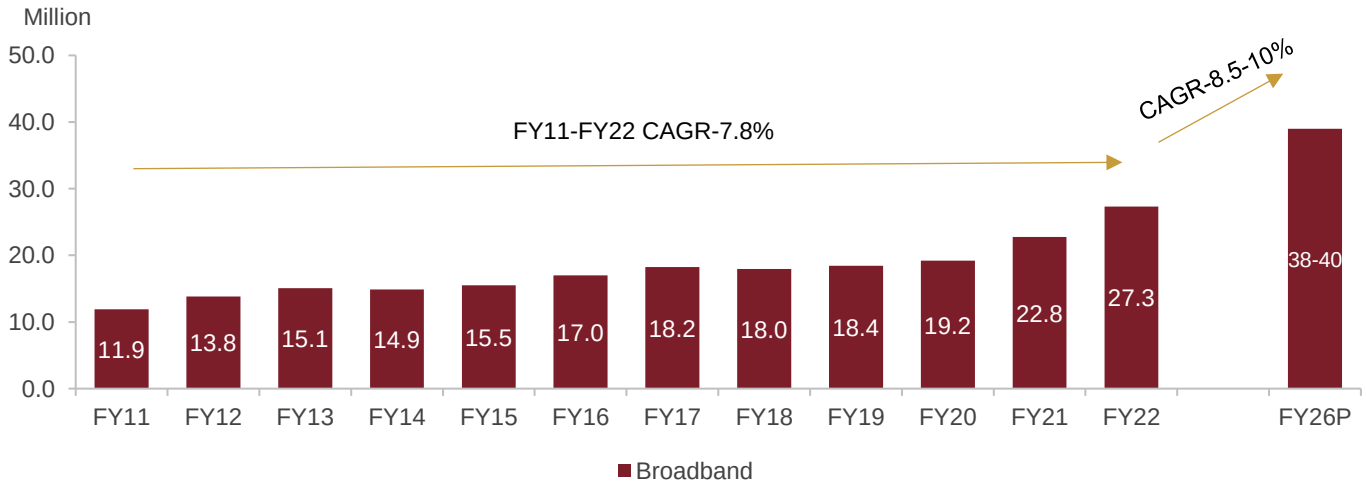
Internet penetration outlook for India



Note: Period is December of the respective years

Source: TRAI, CRISIL Research

Wireline broadband internet subscriber base



Note: P-Projected

Source: CRISIL Research

Fixed or wireline broadband subscribers increased from 17.0 million in March 2016 to 27.3 million in March 2022. As per industry interactions, fixed broadband industry in India is valued at approximately Rs.170-190 billion as of fiscal 2022 with average monthly pricing of Rs.500-550 per connection. The choice of connection type for customer in fixed broadband network is more dependent on availability of type of infrastructure i.e. fiber or cable and there is less differential in prices based on the type of connections. Rise in Internet penetration and increase in usage of high-speed internet will add 11-13 million of additional fixed broadband subscribers by end of fiscal 2026. Demand for high-speed internet to facilitate hybrid work from home, as well as rise in data consumption on internet for entertainment reasons supported by rise in high-definition content in the OTT platforms which consists almost 50% of the total mobile data consumption is expected to drive growth for broadband internet services providers and provide potential growth opportunities to expand their subscriber base.

Fixed broadband plans of some of the key ISPs In India

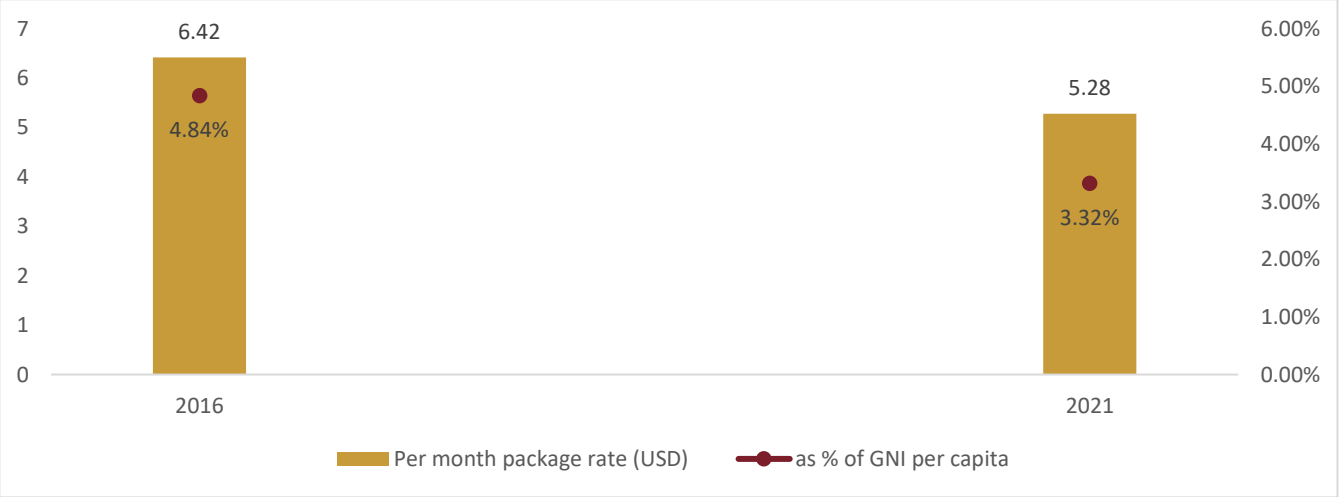
ISP	Up to 50-70 Mbps	Up to 150 Mbps	Up to 200 Mbps	Up to 300 Mbps
Reliance Jio Infocomm Ltd	399*	999	NA	1499
Bharti Airtel Ltd	499	NA	999	1498
Hathway cable and datacom	525	NA	699	NA
Bharat Sanchar Nigam Ltd	599	999	1499	1799
Atria Convergence Technologies Pvt. Ltd	549	799	NA	1349
Asianet Satellite Communications Ltd.	549	749	999	1499
Tikona Broadband	599	799	899	NA

**- Plan value is for speed up to 30 Mbps*
NA- Not available
Note: Monthly broadband plans (Fibre and cable modem) exclusive of taxes
Source: Company website, CRISIL Research

Fixed broadband has become more affordable in the recent years

Fixed broadband in India has seen increased adoption over the last five years. As per the International Telecommunication Union (ITU), the fixed broadband process has declined in India with average monthly package costing 5.28 USD in 2021 declining from 6.42 USD in the year 2016. On similar lines the cost measured as percentage of gross national income per capita have also declined from 4.84% in the year 2016 to 3.32% in the year 2021.

Fixed broadband price trend in India

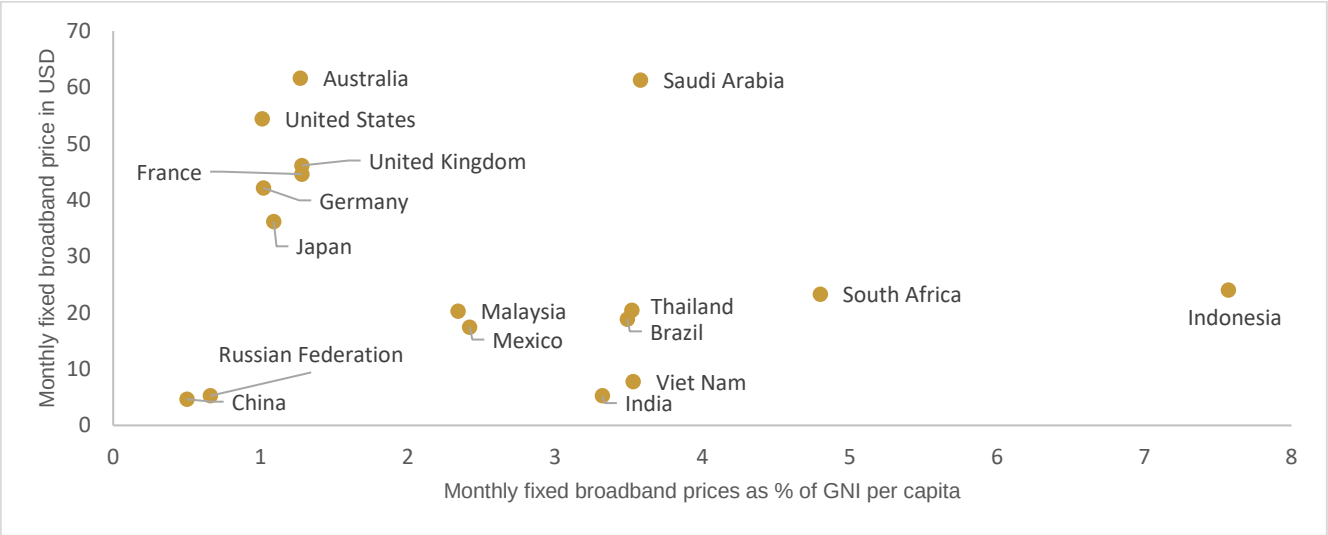


Source: ITU, CRISIL research

The prices for fixed broadband in India have been lower in absolute terms when compared to some of the developed economies and developing economies. However, prices are still higher in terms of Gross National Income (GNI) per capita as compared to other developed markets. Going ahead with rising income levels in the country along with increased level of affordability, prices are expected to remain firm in absolute terms and may rise moderately in medium to long term.

Also there has been a recent tariff hike by telecom players to the tune of 15-20% which is expected to rise the prices of mobile broadband and increase the ARPU of telecom players.

Overview of fixed broadband prices across key countries (2021)



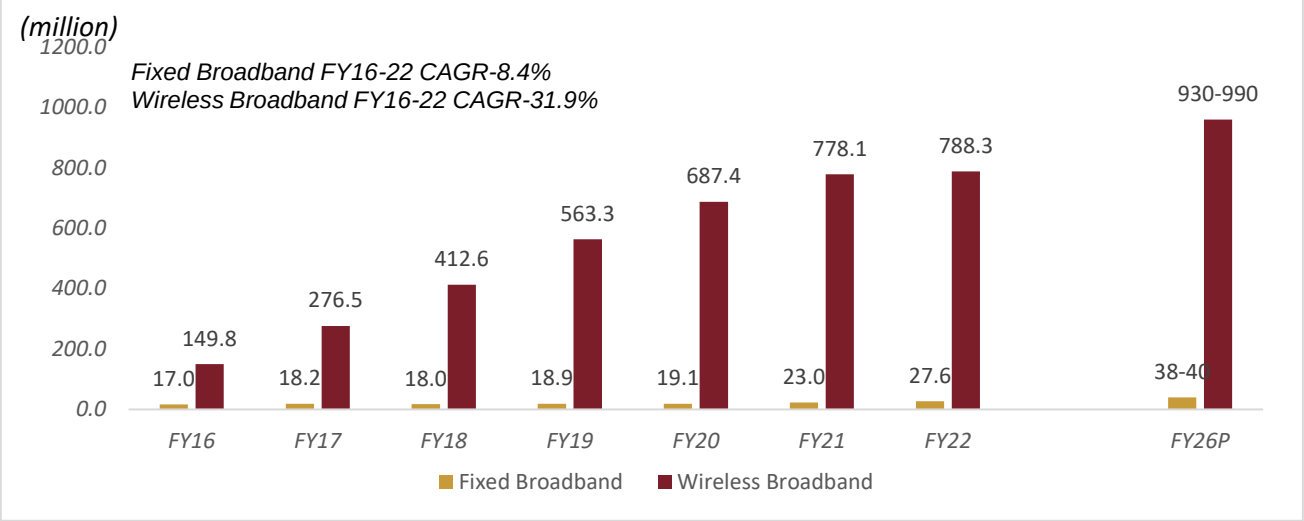
Source: ITU, CRISIL research

Wired internet has ~3% share in total internet subscriber base as of March 2022

As per a TRAI report, the number of internet subscribers increased from 743.2 million in end-March 2020 to 824.9 million by end-March 2022, at an annual growth rate of 5.3%. Out of total 824.9 million internet subscribers, the number of broadband subscribers (including mobile / wireless and fixed) is 788.3 million and the number of narrowband subscribers is 36.6 million as of end-March 2022.

Wireless internet subscribers increased from 720.8 million in end-March 2020 to 797.6 million in end-March 2022, at an annual growth rate of 5.2%. Over the same period, wired internet subscribers increased from 22.4 million to 27.3 million, at an annual growth rate of 10.4%. The wired broadband segment grew faster in the last two fiscals than the wireless broadband segment. Otherwise, fixed broadband connections have seen relatively slower growth in India, registering a CAGR of 5% between fiscal 2016 and fiscal 2022

Wireless Vs Fixed broadband subscribers' growth



Note: P- Projected

Source: TRAI, CRISIL Research

Internet subscriber base mode of access

Segment	Mode of access								Total subscribers (million)	
	Wired subscribers (million)		Wireless subscribers (million)							
			Fixed wireless (Wi-Fi, Wi-Max, radio & VSAT)		Mobile wireless (phone + dongle)		Total wireless			
	March 2021	March 2022	March 2021	March 2022	March 2021	March 2022	March 2021	March 2022	March 2021	March 2022
Broadband	22.8	27.3	0.6	1.2	754.7	759.9	755.4	761.1	778.1	788.3
Narrowband	3.3	0.0	0.0	0.0	44.0	36.6	44.0	36.6	47.2	36.6
Total	**25.9**	**27.3**	**0.6**	**1.2**	**798.3**	**796.4**	**799.3**	**797.6**	**825.3**	**824.9**

Source: TRAI, CRISIL Research

Internet subscribers (million)

As of March, 2022	Fixed line	Fixed wireless	Mobile wireless	Total
Broadband	27.3	1.2	759.9	788.3
Narrowband	0.0	0.0	36.6	36.6
Total	27.3	1.2	796.4	824.9

Note: Fixed wireless (Wi-Fi, Wi-Max, radio & VSAT)
Source: TRAI, CRISIL Research

Work and study at home amid lockdowns drive wired broadband uptake

Globally, work from home has become the new norm due to the Covid-19 pandemic. In India, lockdown and shutdowns have led to more people working from home even through most of CY 2021 and the trend continues in form of hybrid working model in CY 2022. Also, education in most major towns and cities had shifted to the online mode, leading higher usage of data. This drove an increase in wired-broadband subscriptions, which reached ~22.5 million in March 2021 and 27.6 million in March 2022, a rise of ~8.5 million from March 2020. By contrast, wired-broadband subscriber additions from fiscal 2016 to fiscal 2020 have been only ~2 million.

Internet service providers and telecoms have been acquiring new bandwidth and improving last-mile infrastructure to cater to this surge in broadband subscriptions. Also, players such as Reliance Jio and Bharti Airtel have lowered the entry-level broadband plans to Rs 399 and Rs 499, respectively. These developments are likely to improve fixed-broadband penetration in the near term, as we expect wired internet subscriber base (narrowband and broadband) to increase to 29-31 million by fiscal 2023.

In the long term, we expect the wired-broadband subscriber base addition to sustain even after the pandemic is contained, as private players continue to expand home passes, given the increase in last-mile fibre-connectivity investments undertaken amid the pandemic. Further growth of subscribers is likely to increase with adoption of new avenues of consumption such as affordable OTT, hybrid model and online coaching/certifications. Hence, we expect this segment to grow at a CAGR of 8-10% between fiscals 2023 and 2026 to ~40 million.

Also, private telecoms, such as Bharti Airtel and Reliance Jio, are likely to focus on this underpenetrated segment to reduce congestion in wireless networks, as 90% of data capacity is currently handled by wireless networks.

Despite the rising popularity, wired broadband remains largely an urban phenomenon, as ~95% of total subscribers belong to urban areas. This is majorly due to lower willingness in rural areas to get the connection, as the majority of population are non-internet users. Additionally, setting up last-mile infrastructure in rural areas is tedious and uneconomical for players, given the low scale.

Broadband growing steadily over narrowband

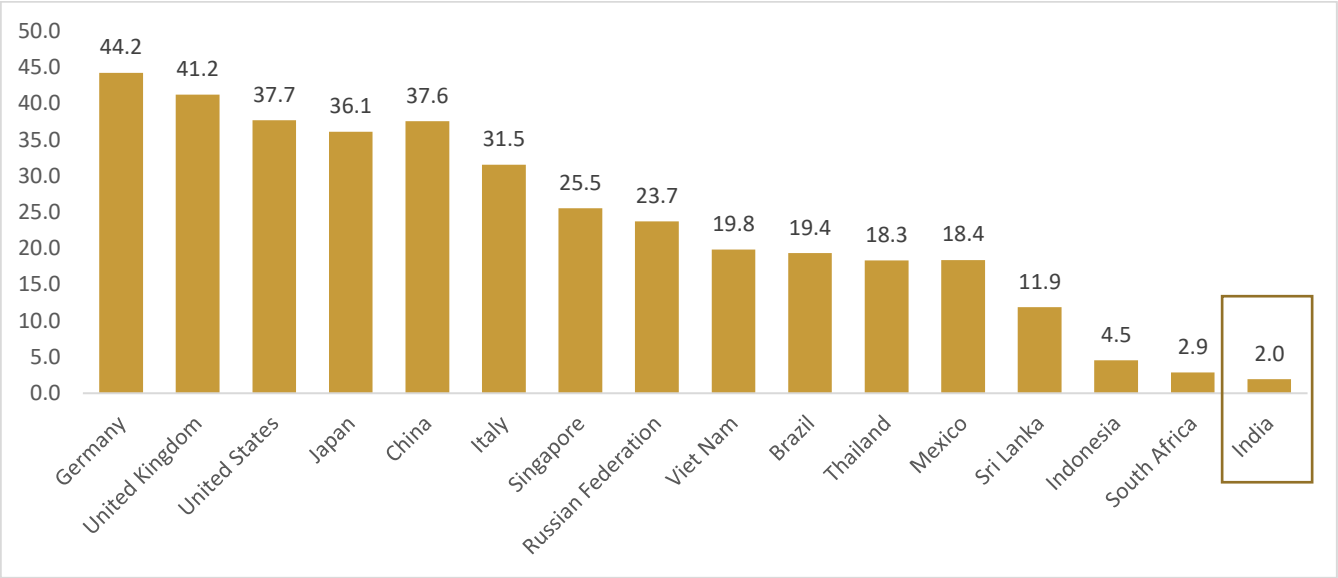
Usage of narrowband internet is primarily in remote locations or on legacy platforms. The number of wired narrowband subscribers has declined over the past few years due to cheaper, more efficient alternatives. Households constituted most of narrowband demand, but they are increasingly adopting broadband services if they get better speed at a similar price. Besides, demand from businesses is limited. The subscriber base of wired narrowband connection slashed from ~8 million subscribers in fiscal 2011 to ~0.03 million subscribers in fiscal 2022. As data demands and file sizes increase, better internet speeds will be required, and private operators will maintain a limited presence in the narrowband space. Hence, narrowband subscribers are increasingly expected to migrate to broadband connections, which offer higher speed and lower price points.

India ranks 9th globally in number of fixed broadband subscriptions

India ranks 9th globally in terms of fixed broadband subscriptions as of 2021 but comprises only ~2% of total global fixed broadband subscriptions. In terms of penetration per 100 people, India has the lowest penetration among the top 10 countries, reflecting huge potential for fixed broadband subscription growth. Although the fixed broadband subscriber base has expanded at 6.3% CAGR between fiscal 2016 to 2021, fixed line broadband household

penetration remains low at ~9% as of fiscal 2022. Also, in terms of population, India has penetration of 2.0 fixed broadband connections per 100 people as of December 2021 which is far lower compared to other countries in the world such as Germany at 44.2 and United Kingdom at 41.2 fixed broadband connections per 100 people. There were 27.6 million fixed broadband connections at the end of fiscal 2022, representing a penetration rate of ~9 per 100 households.

India has one of the lowest broadband subscriptions per 100 people globally



Note: Data as of December 2020

Source: ITU, CRISIL Research

India ranks 70th among 182 nations for fixed broadband speed

In terms of speed, as per Ookla speed test global index July 2022 report, India is experiencing median download speeds of 13.41 Mbps for mobile broadband and 48.03 Mbps for fixed broadband. As per this global index, India ranked 117th among 140 nations in terms of mobile broadband median speed and 70th among 182 countries in fixed broadband. The highest median mobile broadband speed is recorded in UAE which is around 120 Mbps. Whereas, for fixed line broadband, highest median speed reported is that of Chile at 213 Mbps. Global median download speed in case of mobile and fixed broadband is 30.78 Mbps and 67.25 Mbps respectively

Global fixed broadband subscription in top 10 countries

Country	2015 fixed broadband subscription (million)	2021 fixed broadband subscription (million)	CAGR 2015-2021 (%)	Fixed broadband subscription per 100 people
China	277.0	535.8	11.6%	37.6
United States	102.2	127.0	3.7%	37.7
Japan	38.9	45.0	2.4%	36.1
Brazil	25.5	41.5	8.5%	19.4
Germany	30.7	36.9	3.1%	44.2
Russian Federation	26.9	34.6	4.3%	23.7

France*	26.9	30.6	2.6%	46.9
United Kingdom	24.7	27.7	2.0%	41.2
India	16.9	27.6	8.5%	2.0
Korea (Rep. of)	20.0	22.9	2.3%	44.3

**- Value as of year 2020*

Source: International Telecommunication Union (ITU), CRISIL Research

Wired broadband offers more cost-effective plans than wireless broadband

India offers the cheapest data when it comes to mobile data rates measured in terms of affordability expressed as percentage of gross national Income per capita. India had affordability index between 1-2 % as of 2020 which is far lesser than the corresponding value for fixed broadband. India had affordability index of 3-4% which is far higher than the mobile internet affordability value indicating cheaper data plans for mobile internet users. However, when considered in terms of cost per GB usage, fixed broadband offers more cost effectiveness with per GB costs ranging 5-7 times lesser than the wireless or mobile data. For nearly 10-15 times rise in data consumption the price rise for wired broadband is 2.0-2.5x for basic package. Given the increased trend of data usage of consumers in India going ahead fixed broadband may offer cost effective options for subscribers.

Snapshot of comparison of Wired and Wireless broadband services in India

	Wireless broadband	Wired Broadband
Median speed	13.4 Mbps	48.0 Mbps (3.6x times wireless speed)
Average data Usage*	16 GB/User/month	180+ GB/User/month
Data value pack	1.0x	2.0-2.5x

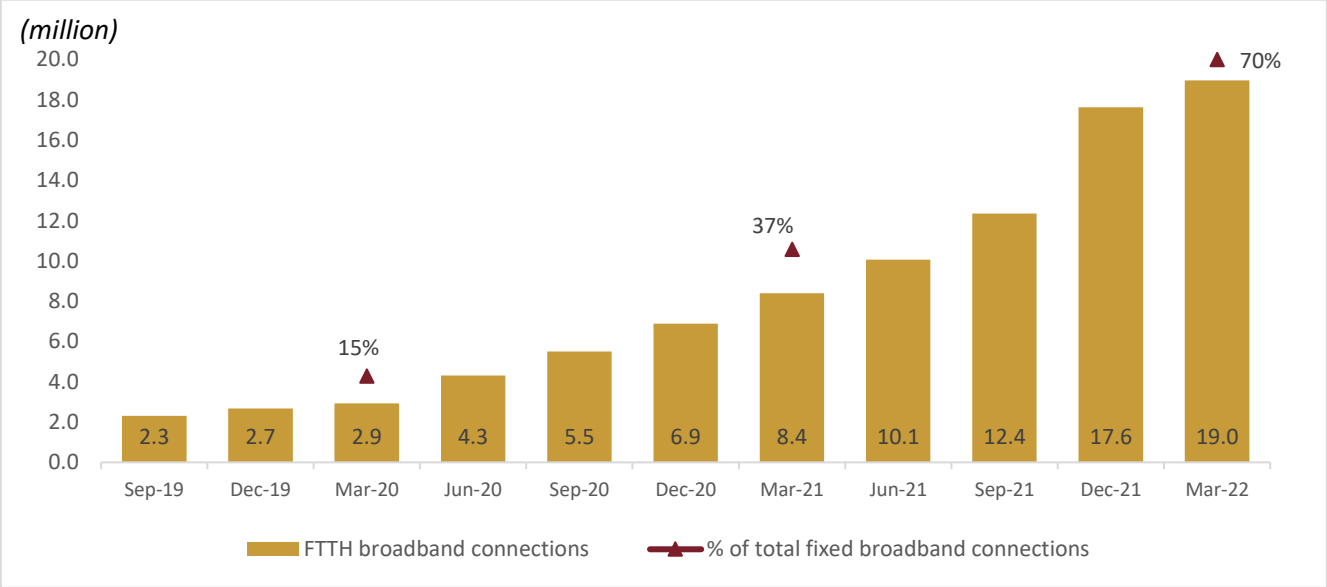
*Note: *-Estimated value for the year 2022*

Source: ICT price trend report 2020, Ookla speed test global index July 2022 report, CRISIL Research

Rise in FTTH technology for fixed broadband in India

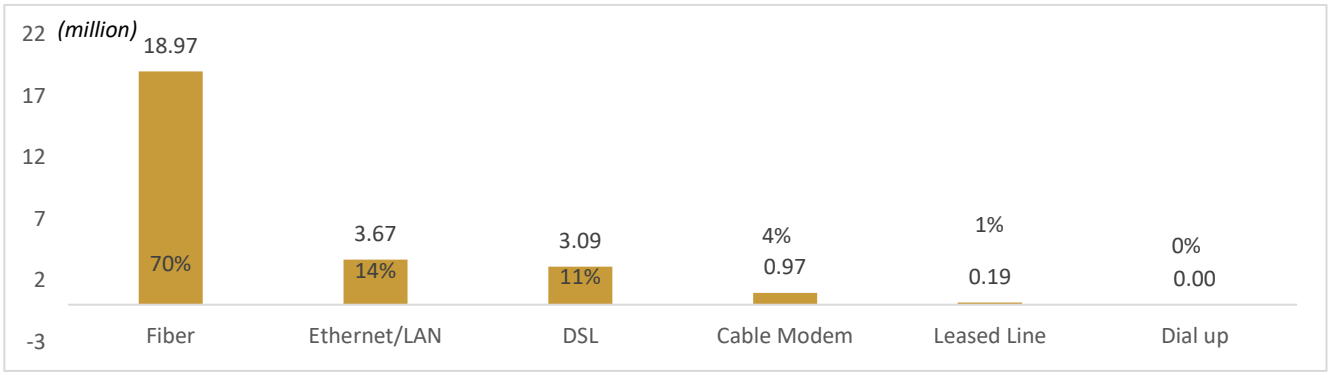
In India, underdevelopment of the fixed broadband market is because of the dominance of mobile telephony and lack of availability of wireline infrastructure. Infrastructure-wise, globally FTTH is one of the most accepted and advanced technologies to provide fixed broadband connections. In India, number of FTTH subscribers have seen a massive growth in last 2 fiscals. The FTTH broadband connections comprise 70% of the total fixed line broadband connections as of March 2022, up from 13.1% in March 2020, which shows rapid adoption of FTTH. Going ahead, wireline or fixed broadband provides huge opportunity for players by expanding their offerings to fixed broadband and reaching underpenetrated populations by establishing the required infrastructure.

Growth of FTTH broadband subscribers in India



Source: TRAI, CRISIL Research

Technology wise trend of wired internet access (March 2022)



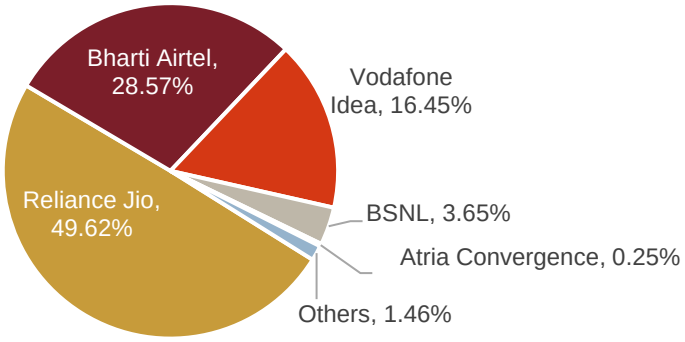
Note: % indicates the share in total wired subscribers; Values indicates the number of subscribers in Mn
Source: TRAI, CRISIL Research

Top five service providers enjoy lion's share in broadband market driven by dominance in wireless segment

The top five service providers constitute 98.54% share of the total broadband subscribers as of end-March 2022. These service providers are Reliance Jio Infocomm Ltd (409.28 million), Bharti Airtel (235.65 million), Vodafone Idea (135.71 million), BSNL (30.09 million) and Atria Convergence (2.08 million).

As on March 31, 2022, the top five wired Broadband service providers are Reliance Jio Infocomm Ltd (19.37%), Bharti Airtel (16.61%), BSNL (14.11%), Atria Convergence Technologies (7.61%) and Hathway Cable & Datacom (4.07%). As on March 31, 2022, the top five wireless broadband service providers were Reliance Jio Infocom Ltd (50.65%), Bharti Airtel (28.98%), Vodafone Idea (17.01%), BSNL (3.29%) and Intech Online (0.03%).

Service provider-wise market share of broadband (wired + wireless) services



Note: Data as of March 2022

Source: TRAI, CRISIL Research

Internet subscriber base and market share of top 10 service providers (March 2022)

Rank	ISP	No. of subscribers (million)	Share (%)
1	Reliance Jio Infocomm Ltd	409.28	49.62%
2	Bharti Airtel Ltd.	235.65	28.57%
3	Vodafone Idea Ltd	135.71	16.45%
4	Bharat Sanchar Nigam Ltd.	30.09	3.65%
5	Atria Convergence Technologies Pvt. Ltd.	2.08	0.25%
6	Hathway Cable And Datacom Limited	1.11	0.13%
7	ONEOTT iNTERTAINMENT LIMITED	1.01	0.12%
8	YOU Broadband India Ltd.	0.84	0.10%
9	GTPL Broadband Pvt. Ltd.	0.75	0.09%
10	Excitel Broadband Pvt. Ltd.	0.68	0.08%
16	Asianet Satellite Communications Ltd.	0.4	0.05%
	Total of top 10 ISPs	**817.2**	**99.07%**
	Others	**7.69**	**0.93%**
	Grand total	**824.89**	**100.00%**

Source: TRAI, CRISIL Research

Reliance Jio holds the top position with 49.62% share of internet subscribers, followed by Bharti Airtel Ltd with 28.57% and Vodafone Idea with 16.45% as of March 31, 2022.

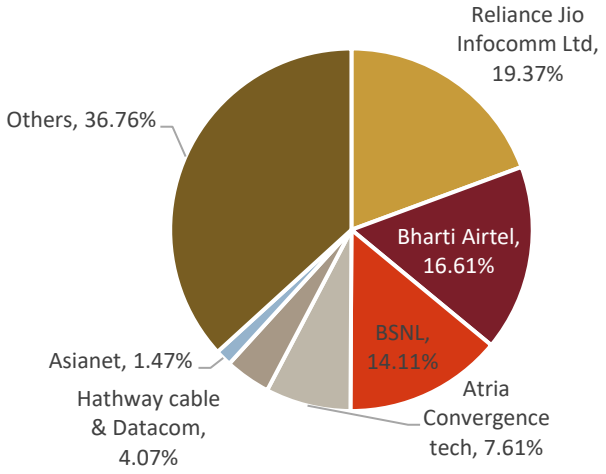
Out of 660 ISPs in India as of March 31, 2022, the top 10 service providers collectively hold 99.07% of the total internet subscriber base. The total subscribers for Asianet increased from 0.3 million in March 2021 to 0.4 million in March 2022. Asianet Satellite Communications Ltd is ranked 16th among the 660 ISPs in India with 0.4 million subscribers and market share of 0.05% as of March 2022.

Non-telecom players have more presence in wired internet segment as of fiscal 2022

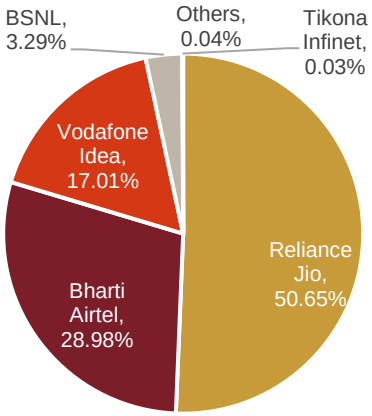
Out of 27.3 million wired internet subscribers, Reliance Jio Infocomm Ltd holds 19.37% market share with 5.28 million subscribers, followed by Bharti Airtel with 4.53 million subscribers as of March 31, 2022.

In the wireless internet segment, Reliance Jio holds 50.65% market share with 403.99 million subscribers followed by Bharti Airtel Ltd with 28.98% and 231.13 million wireless internet subscribers as of March 31, 2022.

Composition of wired internet subscribers



Composition of wireless internet subscription



Note: Data as of March 2022
Source: TRAI, CRISIL Research

Bundling TV with broadband can result in huge uptake in wired broadband subscribers

With a mere seven connections per hundred households, India's wired broadband market is highly underpenetrated. In comparison, developed nations, such as the US, the UK, France and Japan, have 30-50% penetration. In contrast, India has a high TV penetration of ~65%, with about 190 million households owning cable or direct-to-home (DTH) connections. Of this, ~167 million households are without wired broadband connections (assuming a household with wired broadband also owns a TV). These households could have been a ready target market had broadband services been bundled with TV subscription at competitive rates. Bharti Airtel and BSNL have been experimenting tie-ups with local cable operators (LCOs). In fact, Bharti Airtel has expanded its LCO tie-ups in about 48 cities as of December 2020.

MSOs and LCOs looking to tap synergies between cable and broadband businesses

Multiple system operators (MSOs) and LCOs have been the backbone of the TV distribution network in India. Typically, LCOs are small entrepreneurs with smaller business units that provide last mile connectivity for TV distribution. MSOs and LCOs operate in remote areas of the country. To create awareness on the benefits of broadband connections in subscribers, MSOs and LCOs can play a big role. This, in turn, can help digitise the TV network as well as offer higher speed broadband connections to end consumers.

MSOs and LCOs are leveraging last mile connectivity to offer broadband services to consumers through coordination with on-ground teams. Linking end users with a national fibre optic network to provide broadband will give MSOs and LCOs an additional income, provide employment to people (including those in rural areas), apart from contributing to the national economy and the digitisation goal.

The cable TV industry also has a track record of managing to connect to many households in the country. If a feasible business model with support from the right operator along with the right technology vendor is worked out for cable operators, they can build last mile networks and market them by telling people the benefits as well as how to utilise them. This will increase the share of fixed line broadband to match the global average and improve the penetration of fixed broadband in the country.

Also, with the advent of technology advancements such as GPON, where bundled telecom, broadband and TV services can be offered through optical fibre network at higher speed, MSOs/LCOs can leverage their distribution strength to connect with the end users and tap into the broadband business for an additional revenue stream.

Broadband and 5G FWA

Fixed Wireless Access (FWA) uses a mobile network to power a router that provides a similar experience to fixed line connectivity.

The advantage of 5G FWA is that it can deliver broadband services in hard-to-reach areas. But wireline broadband has advantages in terms of total cost of ownership (TCO) and lifetime-value of FTTP is compelling. FTTP is a superior solution for fixed locations in comparison to 5G FWA. 5G FWA has ongoing investments and challenges related to spectrum availability and interference

Futuristic demand from Industry 4.0 and IoT

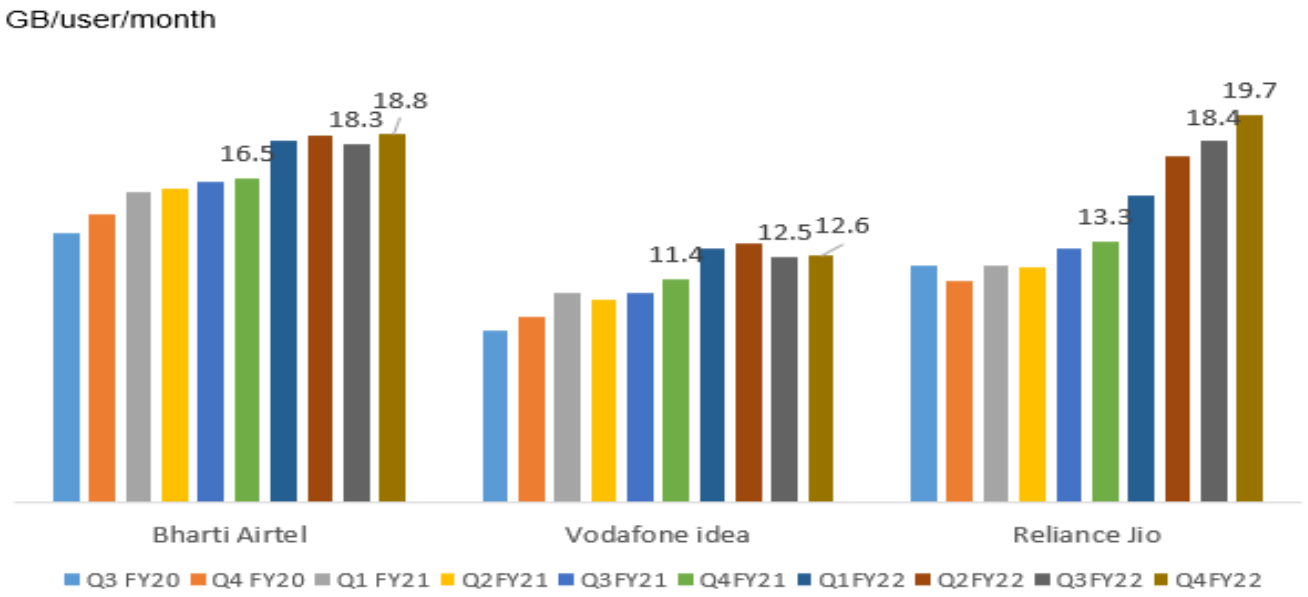
Fixed broadband is highly relevant in enterprises, homes, educational institutes, and offices. Business and industrial requirements from industrial IoT, machine-to-machine communication and Industry 4.0, will drive up the demand for fixed broadband lines. On the retail front, increasing adoption of internet-connected devices, smart TVs and smart home devices, as well as consumers' media consumption through internet applications, will continue to drive high-speed fixed broadband adoption.

Data usage to moderate in this fiscal and next fiscal owing to tariff hikes; 5G adoption to increase data consumption

Monthly average data usage is estimated to have reached ~13.5 GB/ sub/ month in fiscal 2021 and is further grew to 16.4 GB/sub/month in fiscal 2022 driven by increased data usage amidst the persistent work and study at home behaviour.

However, post the recent tariff hikes and amid inflationary pressures, the data consumption is expected to moderate driven by customer downtrading to lower recharge plans as users try to mitigate the impact of these tariff hikes on their pockets. Also, as offices are expected to operate on hybrid model and schools are expected to operate at maximum capacity, users will most likely consume lesser data resulting in downgrading their plans. In lieu of this, we are likely to see moderate data consumption growth in fiscal 2023. Post launch of 5G in fiscal 2023, CRISIL Research expects only some top-line subscriber base of 4G to migrate to 5G in fiscal 2024. Therefore, despite the 8-10x downloading capacity of 5G over 4G, the limited subscriber base to cap the maximum data consumption in fiscal 2024 to 16.5-17.5 GB/ Sub/ month.

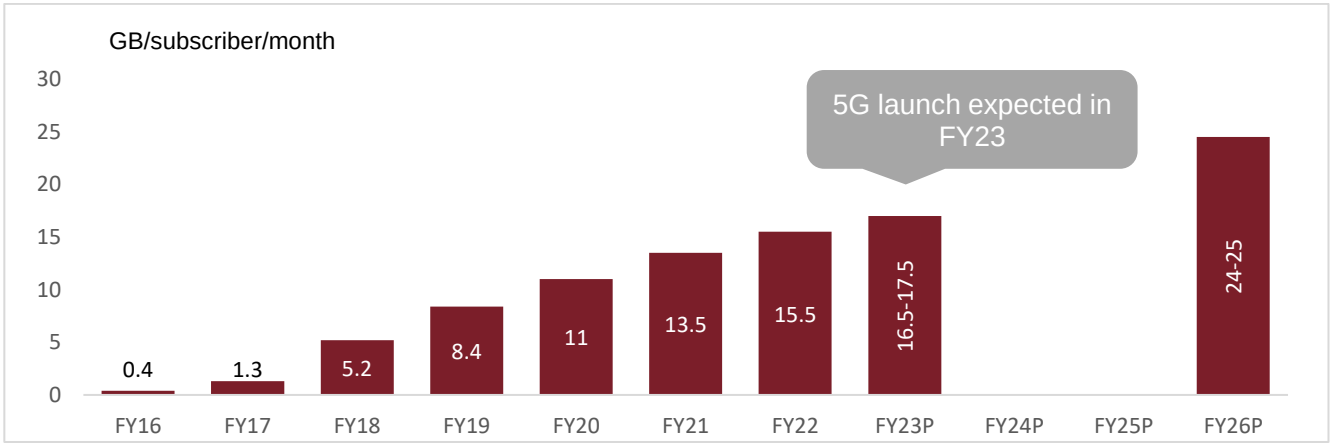
Steady rise in data usage per subscriber for all the three major telcos



Note: Unit is GB/subscriber/month
Source: TRAI, CRISIL Research

Over fiscals 2022-2026, CRISIL Research expects growth in average data usage to continue growing at a CAGR of ~12% to reach 24-25 GB driven by rising smartphone adoption, usage of hgher bandwidth applications (OTT apps) and more importatntly 5G launch.

Blended average data usage per subscriber to near 15 GB in this fiscal



Note: P- Projected; Unit is GB per subscriber per month

Source: TRAI, company reports, CRISIL Research

Kerala state has one of the highest overall tele-density among the Indian states

Kerala is known as state with highest literacy rate. Highest literacy rate in the state helps to raise awareness about the upcoming technological trends in the state. In line with this Kerala has one of the highest tele-density in India. Among the states considered below Kerala has the highest tele-density at 125.2% as of March 2022.

Wireless subscriber details for key states*

Wireless subscriber base (million)	Bharti Airtel	Reliance Jio	Vodafone Idea	BSNL	Total number of wireless subscribers	Overall tele-density
Maharashtra	20.3	36.7	28.7	6.7	92.3	103.2%
Andhra Pradesh	31.4	28.8	13.7	9.3	83.1	93.5%
Tamil Nadu	27.4	23.8	17.9	9.7	78.9	103.8%
Madhya Pradesh	15.1	35.7	20.0	6.0	76.8	67.4%
Karnataka	30.6	19.5	7.6	6.9	64.7	100.1%
Kerala	7.7	9.2	16.0	10.5	43.4	125.2%
Odisha	11.1	13.4	1.8	6.3	32.5	74.4%

Note: Data as of March 2022, Telecom and Internet subscriber details for Andhra Pradesh includes Telangana
**Wireless subscriber refers to cell phone users for voice connection*
Source: TRAI, CRISIL Research

Broadband subscriber details for key states (March 2022)

States	Urban subscribers (million)	Rural subscribers (million)	Total broadband subscriber (million)	Share of urban (%)	Share of rural (%)	Share in total broadband subscribers in the country (%)	Broadband penetration (Per household)	Fixed Broadband penetration per household
Maharashtra	66.32	29.04	95.36	70%	30%	12%	3.90	0.08
Andhra Pradesh	15.15	14.91	30.06	50%	50%	4%	1.43	0.13
Tamil Nadu	38.64	14.41	53.05	73%	27%	7%	2.86	0.13
Madhya Pradesh	24.53	15.6	40.13	61%	39%	5%	2.66	0.05
Karnataka	29.43	16.4	45.83	64%	36%	6%	3.43	0.16
Kerala	15.62	13.73	29.35	53%	47%	4%	3.74	0.19
Odisha	7.01	13.14	20.15	35%	65%	3%	2.09	0.03
India	473.99	314.3	788.29	60%	40%		3.16	**0.09**

Note: Includes both wireless and wired broadband subscriptions,
NA: Not available, Broadband penetration is calculated on per household basis; Household data from census 2011
Source: TRAI, Census 2011, CRISIL Research

Demographics of key states

States	Population (million)*	Literacy (%)*	Per capita NSDP (Rs) at current prices^	Total broadband subscriber (million)^^	Total Fixed broadband subscriber# (million)
Maharashtra	112.4	82.91	202,130	95.36	1.99
Andhra Pradesh	84.6	67.02	168,480	30.06	2.71
Madhya Pradesh	72.6	69.32	103,288	40.13	0.76
Tamil Nadu	72.1	80.09	213,396	53.05	2.43
Karnataka	61.1	75.36	223,175	45.83	2.16

States	Population (million)*	Literacy (%)*	Per capita NSDP (Rs) at current prices^	Total broadband subscriber (million)^^	Total Fixed broadband subscriber# (million)
Odisha	42	72.87	110,434	20.15	0.28
Kerala	33.4	94.00	221,904	29.35	1.48

*Note: NA - Not available; *According to 2011 Census, Number of households has been taken from Census 2011*

^Figures mentioned are for FY20, according to Handbook of Statistics on Indian States published by RBI in October 2020,^^-Numbers for the year FY22, #Numbers for the year FY21

Source: RBI, CRISIL Research

Key observations

- Amongst the states in India, Kerala has the highest literacy rate of 94% according to the 2011 Census
- Kerala has one of the highest fixed broadband penetrations among the states considered, with a fixed broadband penetration of 19 connections per 100 household as of fiscal 2022

Overview of broadband industry in Kerala

With the rise in adoption of digital technology, internet and telecom services have seen huge acceptance among the population. Indian government has been taking initiatives to consolidate the digital infrastructure in the country. At the state level too, state governments have been taking various initiatives to enhance digital connectivity. Internet penetration and telecom penetration are some of the key metrics for any state.

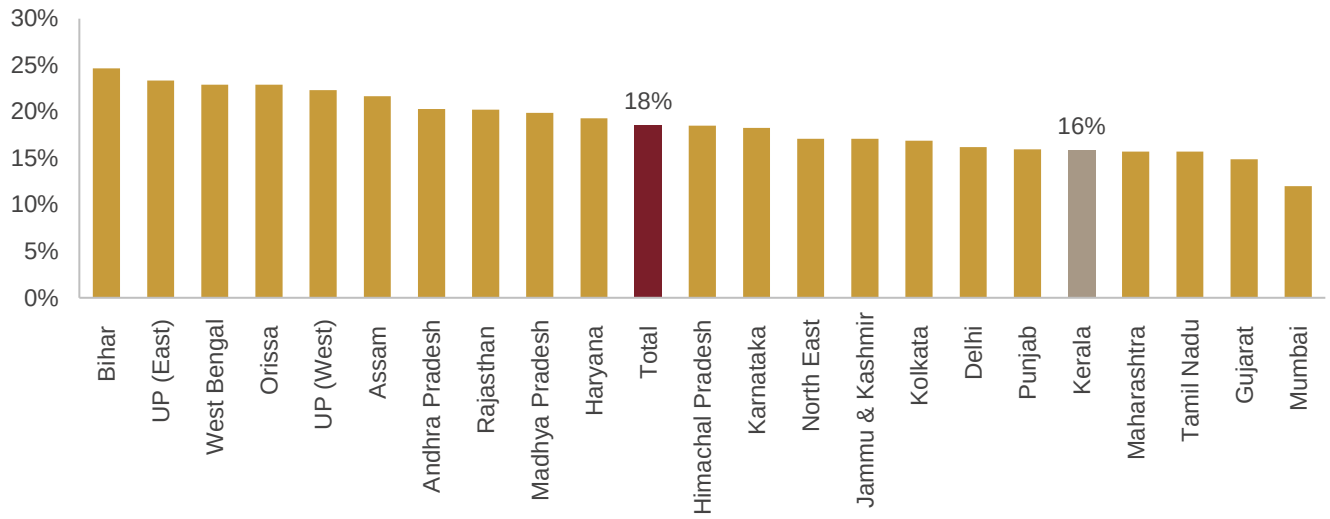
Kerala has achieved the distinction of a state having one of the highest tele-density in the country, with the figure at 125% as of March 2022. As per the TRAI indicator report, Kerala has 30.34 million internet subscribers, of which 14.24 million are from rural areas and 16.1 million are urban subscribers as of March 2022. In addition, the state has an internet penetration of approximately 85 people per 100 population, which is significantly higher than the national average of approximately 60 people per 100 population. The total internet subscriber growth in India was 18% CAGR from calendar year 2014 to 2021, whereas the growth in the internet subscriber base for Kerala was around 16% CAGR.

State-wise internet subscribers as of March 2022 (million)

State	Total internet subscribers	Broadband subscribers	Fixed line broadband subscribers	Fixed line broadband share in broadband subscribers	No. of Internet subscribers per 100 population
Andhra Pradesh	64.2	60.9	2.7	4.5%	68.2
Karnataka	50.1	47.4	2.2	4.6%	71.5
Madhya Pradesh	55.4	52.1	0.8	1.5%	49.2
Maharashtra	71.1	67.6	2.0	2.9%	79.5
Odisha	21.6	20.5	0.3	1.4%	47.3
Tamil Nadu	56.7	53.5	2.4	4.5%	71.4
Kerala	30.4	28.9	1.5	**5.1%**	**85.2**

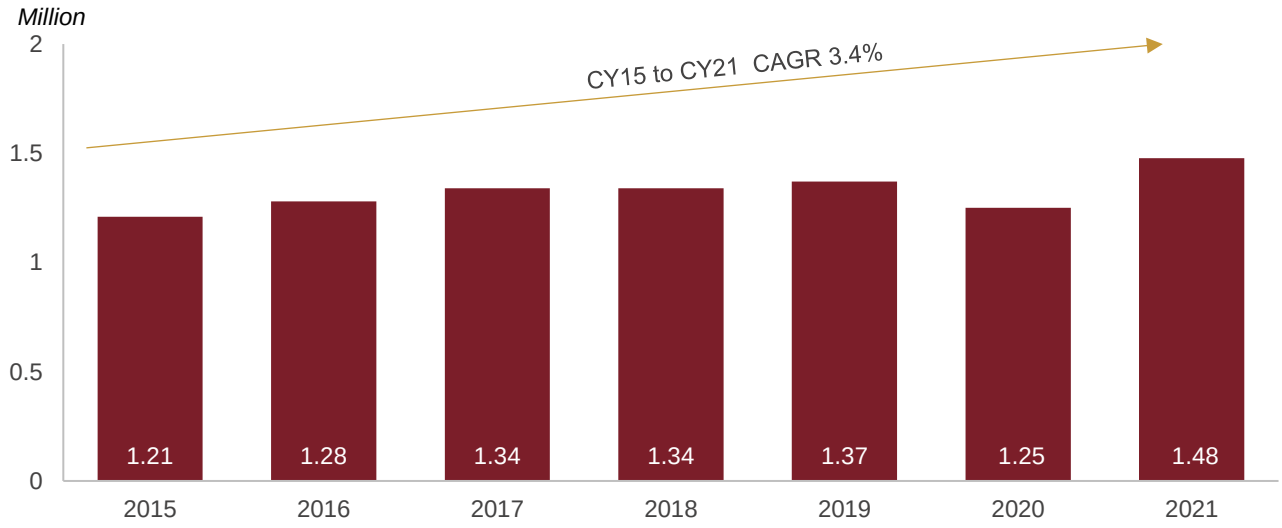
Source: TRAI, CRISIL Research

Internet subscriber growth CY14-CY22



Source: TRAI, CRISIL Research

Fixed line/wireline broadband subscribers in Kerala



Source: Dept. of Telecommunications- Telecom Statistics India 2021 (published on July 2022), TRAI, CRISIL Research

Fixed broadband connections in Kerala have grown from 1.21 million in 2015 to 1.48 million in 2021, at the CAGR of 3.4%, while fixed broadband connections in India grew at 8.2% CAGR.

Kerala has one of the highest internet fixed broadband share in India with share of 5.6% in the total broadband internet subscribers base; the penetration (in terms of fixed broadband in total internet subscribers), at 5.1% is also higher than the India average of 3.2% as of December 2021. Airtel, BSNL and Asianet, Reliance Jio, Kerala vision are some of the key internet service providers in Kerala.

Kerala reported fixed broadband penetration of ~15-19 connections per 100 households as of FY 2022. India reported fixed broadband penetration of 8.5 – 8.8 connections per 100 households as of FY 2022.

Kerala features among top states in India with higher per capita income and spending affordability, high penetration of urban market, high literacy rate, which is expected to further push demand for high-speed internet and

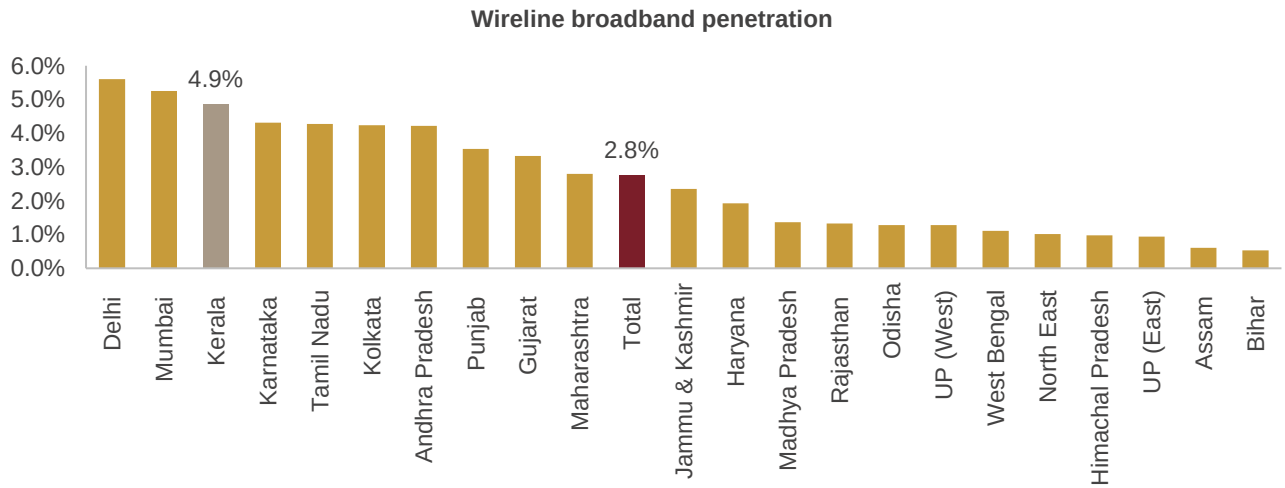
broadband services. Developed market have penetration of fixed broadband of the range 35-45 connection per 100 population with global average of 17 connection per 100 population. With rise in per capita income, rise in consumption expenditure and rise in demand for high-speed internet driven by data consumption for entertainment and business purpose the penetration of fixed broadband is expected to deepen in India in line with developed markets. State of kerala is also expected to witness rise in penetration of fixed broadband driven by growth in per capita, rise in spending, rise in demand for high speed and high data consumption from online video and music streaming, hybrid work from home and penetration of digital service in business environment.

Subscribers in Mn	FY16	FY17	FY18	FY19	FY20	FY21	FY22	CAGR FY16-FY22
Internet subscribers								
India	343	422	494	637	743	825	825	15.8%
Kerala	13.0	14.6	16.6	19.8	24.7	26.5	30.4	15.2%
Fixed broadband								
India	17.0	18.2	18.0	18.4	19.2	22.8	27.3	8.2%
Kerala	1.21	1.28	1.34	1.34	1.37	1.45	1.48	3.4%

Source: CRISIL Research

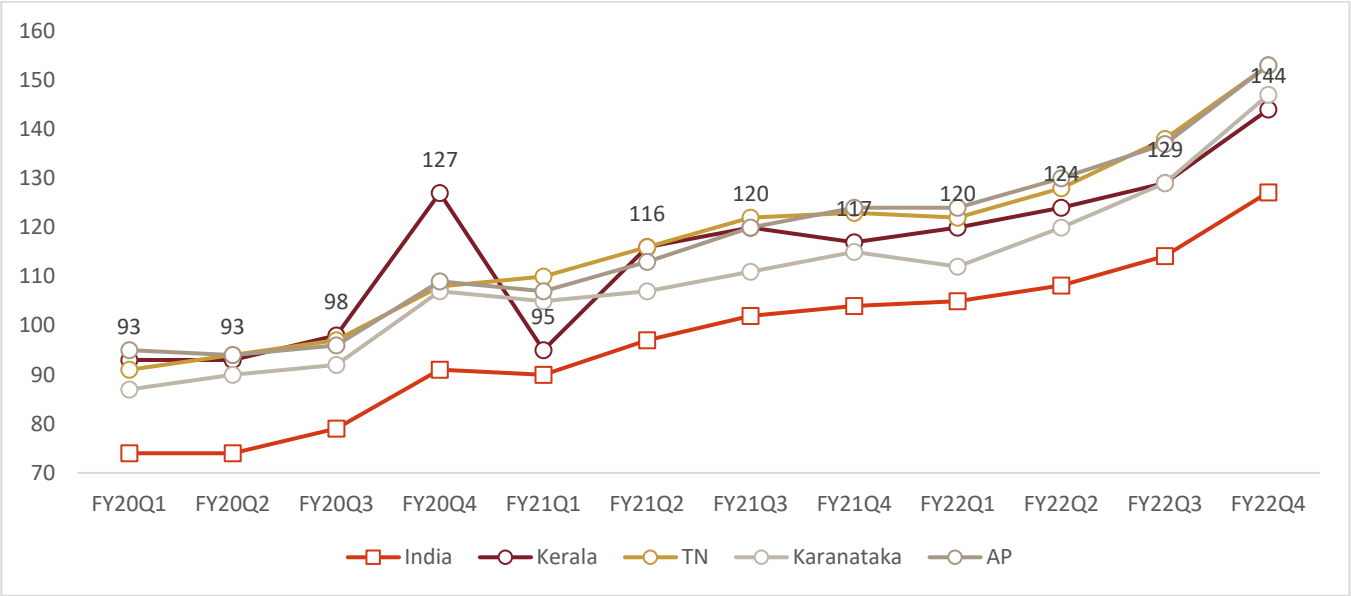
Although the penetration in Kerala is one of the highest, looking at the subscriber base, Kerala still has potential to add to its subscriber base. The high literacy rate, which can help spread greater awareness on advantages of broadband connections, can accelerate growth in the fixed broadband segment in Kerala.

State-wise wireline broadband penetration (fiscal 2021)



Source: TRAI, CRISIL Research

Southern states such as Kerala, Tamil Nadu, Karnataka and Andhra Pradesh have higher telecom spending as compared to India average



Note: Data as per ARPU of wireless revenue service
Source: TRAI, CRISIL Research

Key government policies for improving digital infrastructure

Transformative potential of broadband technology has far reaching implications for the society, industry, government and economy. Because of its critical role in the operation of modern societies, there has been a global increase in the use of broadband internet during the past decade. In an effort to quantify the above-mentioned consequences, economists and academics have consistently stated that broadband penetration has a direct link to socio-economic welfare. Wireline and wireless connectivity has been very impactful in promoting the vision and mission under the government's Digital India initiative. Following are some of the programmes announced under this initiative, which are increasing the adoption of internet connectivity in India:

Broadband Highways

- This covers three sub-components, namely Broadband for All Rural, Broadband for All Urban and National Information Infrastructure
- Under Broadband for All Rural, 250,000 village panchayats would be covered. DoT (Department of Telecommunications) will be the Nodal Department, and the project cost is estimated to be approximately Rs. 320 billion
- Under Broadband for All Urban, virtual network operators would be leveraged for service delivery and communication infrastructure in new urban development and buildings would be mandated
- National Information Infrastructure would integrate networks like SWAN (Statewide Area Network), NKN (National Knowledge Network) and NOFN (National Optical Fiber Network) along with cloud-enabled national and state data centres. It will also have provision for horizontal connectivity to 100, 50, 20 and 5 government offices/ service outlets at state, district, block and panchayat levels, respectively. DeitY(Department of Electronics and Information Technology) will be the nodal department, and the project cost is estimated to be around Rs 156.9 billion for implementation in two years and maintenance and support for five years.

Universal Access to Mobile Connectivity

- The initiative will focus on network penetration and fill the gaps in connectivity in the country
- Approximately 55,619 uncovered villages in the country will be provided universal mobile connectivity
- DoT will be the nodal department, and project cost will be around Rs 160 billion during fiscals 2014-2018

Public Internet Access Programme

- The two sub-components are common service centres (CSCs) and post offices as multi-service centres
- CSCs would be strengthened, and the number would be increased from approximately 135,000 operational at present to 250,000, i.e. one CSC in each gram panchayat. CSCs would be made viable, multi-functional end-points for delivery of government and business services. DeitY would be the nodal department to implement the scheme
- A total of 150,000 post offices are proposed to be converted into multi-service centres. The Department of Posts would be the nodal department implementing this scheme

4 Overview of media and entertainment (M&E) industry in India

Segments in M&E industry

Television (TV)

The TV value chain comprises content providers, broadcasters, distributors, and subscribers.

Content providers: They supply content either on a commissioned or sponsored basis (explained under 'types of TV content'). As their importance is associated with content exclusivity and reputation, some of these providers produce some/all content themselves.

Broadcasters: Broadcasters uplink content supplied by providers to a satellite for broadcasting into TV homes. There is intense competition amongst them as entry barriers are low and viewers have plenty of options. Their share in the TV subscription revenue is about 15%, which is expected to increase once the full benefits of digitalisation kick in.

Distributors: Distributors link broadcasters with end consumers. There are around 1,760 registered MSOs (Multi System Operator) with MIB (ministry of Information broadcasting) as of May 2022, and ~60,000 local cable operators (LCOs) in the Indian market. This is a highly fragmented and unorganised chain. LCOs tend to under-report subscribers particularly in smaller towns, given the lack of addressable systems. MSOs, in turn, control several LCOs and act as a link between the LCOs and broadcasters. DTH operators are also classified as distributors.

Subscribers: There are over 160 million C&S (Cable & Satellite) subscribers in the country, who pay charges of Rs 100-400 per month, depending on their location. These subscribers often do not have a choice in terms of subscription, as LCOs enjoy monopoly in their respective areas. However, this situation is gradually changing with an increasing acceptance of digital viewing platforms (digital cable and DTH) and a shift to digital cable in large cities, with the digitalisation deadline mandated by the information and broadcasting ministry.

Radio

Radio is the most local and one of the cheapest modes of media entertainment. In radio communication, the message signal wave (low frequency) is combined with a carrier signal (high frequency). Depending on several factors such as range, application and budget, modulation is divided into three types: amplitude modulation (AM), frequency modulation (FM) and phase modulation (PM). Of these three, the former two are widely known as they form a major commercially applicative part of radio communication.

Signal quality is a lot superior in FM than in AM as amplitude-based signals are more susceptible to noise than those using frequency. AM works at 540-1650 kHz and FM at 88-108 MHz.

Main participants in radio value chain

Source: CRISIL Research

The state broadcaster, All India Radio reaches out to nearly 92% of the country's area and 99.19% of the Indian population and transmits programmes both on AM and FM frequencies. A set of new players entered the sector with the privatisation of FM radio. Implementation of Phase III of the licensing policy (FM radio privatisation) has further extended its reach among masses and is also expected to improve the industry's revenue.

Newspaper

India is one of the largest newspaper markets in the world. Readership in the country is rising, despite increasing internet penetration, because of a rise in literacy levels and relative under-penetration of newspapers. CRISIL Research expected 25-30% growth in fiscal 2022 due to increased circulation in fiscal and due to economic recovery in ad spends by Real estate, FMCG, automobile and education. More than 65% of the revenue is driven by advertisements. Key players in this industry include Bennett Coleman and Company Ltd, Jagran Prakashan, DB Corp, HT Media and Amar Ujala.

The industry is extremely fragmented and enjoys regional diversity. With over 2,000 daily newspapers in the country, no single newspaper dominates national circulation. The industry can be segmented across languages, i.e., English, Hindi, and regional languages or across genres, namely, general and business. Further, about 90% of these dailies are published in Hindi and regional languages, while the rest are in English. The content and circulation of English language newspapers is focused on large urban markets. Hindi and other language newspapers cater more to the hinterland.

Distribution process in newspaper supply chain

Source: CRISIL Research

There are three main players in the newspaper supply chain - newspaper publisher, distributor, and vendor. Once a newspaper is published, it gets dispatched to distributors across a region, through private carriers within the area or public transport/couriers for longer distances. The distributors, in turn, appoint agents/hawkers/vendors who deliver newspapers at the subscriber's doorstep or sell newspapers at their stands. Newspaper publishers pay a commission of 30-35% of the selling price of the newspaper, which is shared among distributors and vendors. Generally, vendors get the highest commission.

Films

The value chain of the Indian film industry, one of the largest globally in terms of film production and theatre admissions, has three vital stages: production, distribution, and exhibition.

Production: On deciding to make a film, a producer arranges for its shooting, editing, and dubbing, and finally delivers it to the audience. Producers get a 'minimum guarantee fee' from distributors before a film is released in

return for the film's distributing rights in a territory or several territories within the country. Producers sell the film's rights overseas as well. If it performs well, and the distributor recovers his investment, any additional inflow gets divided between the two in accordance with pre-defined arrangements. Lately, many producers have entered revenue-sharing arrangements with distributors.

Producers finance films through internal accrual, bank finance, private financiers, or equity. In certain cases, the film's cost is raised by selling its rights upfront to distributors, while in a few other cases, producers can recover a substantial part of the film's cost by pre-selling it to distributors.

Distribution: Film distributors buy the distribution rights from a producer within a territory or across several territories. In return, they offer a minimum guaranteed fee to the producer. In some cases, distributors purchase the rights well in advance of the film's release, while lately, in most cases, the same is on a revenue-share basis (with the producer).

As there is no set method to determine the amount payable towards distribution rights, this poses a huge risk in case a film does not perform well at the box office. Distributors play various roles, including part-financing films, spending on print and publicity, selection of exhibition halls, and managing the distribution of film prints. Distributors in India are rarely involved at the pre-production or production stage, and they get to see a film only after it is completed.

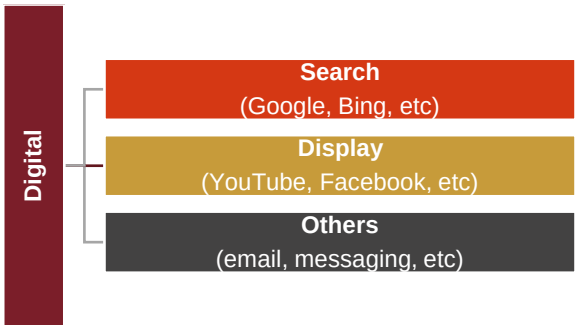
Exhibitors: Exhibitors are the link between film distributors and the audience, controlling the last mile in the box office value chain, i.e., the theatre. Initially, the theatre-hire model was the most followed model, wherein distributors had to bear the burden of theatre rentals, irrespective of whether a film delivered or not.

In the changing scenario, revenue collected at the box office gets shared between theatre owners and distributors, especially in the case of multiplexes. In some small cities, where revenue recording mechanisms are suspect, distributors enter a fixed hire or minimum guarantee plus royalty contracts with exhibitors.

Digital

Digital is expected to grow the fastest over the next few years among all media segments, with its growing reach (particularly with the spread of smartphones and high-speed internet services) and effective measurement tools. There is growing acceptance of digital media among advertisers, which is expected to translate into higher share of spends in the medium.

Major sub-segments under digital advertising



Source: CRISIL Research

Search: Revenue is primarily from featured advertisements that appear on top of search engines while surfing. This includes paid listings, inclusions, and contextual text links. While Google has 95% market share, competitors such as Yahoo and Bing have lower cost per click due to a smaller user base. The shift of advertisements from Google to Yahoo or Bing is unlikely, given the former's dominant position.

Display: This comprises rich media, banners, video, and advertisements of a company displayed on a website or blog. Google has 70% market share in this segment (if advertisements on its own websites such as YouTube and Google Finance, and its network of websites and applications are considered). Other major players include social media sites such as Facebook and news-based sites like Times Internet Group and Network18.

Recently, the share of e-commerce websites such as Flipkart, Amazon India and Snapdeal, and media streaming websites like YouTube and Gaana.com has grown significantly. Times Internet has the largest share among Indian players.

Others: This segment mainly includes email and messaging and is allocated a lower advertising budget as compared to search and display.

Music

India's music industry has a unique structure in the global markets. The new Hindi film segment, accounting for more than half of the industry's revenue, is extremely risky for music companies, as it may not be able to recover the upfront cost paid towards the acquisition of music rights (also called minimum guarantee) in case an album does not do well.

The acquisition cost of music rights for films has declined significantly from the heights touched towards the end of 1990s. Film producers are now willing to enter into revenue-sharing agreements with music companies, ensuring more equitable sharing of risks and rewards.

Other genres of the music industry are old Hindi film music, English music, ghazals, classical music, regional music, and devotional music. With the advent of satellite TV and increased consumer exposure to non-film music, other music genres are also gaining popularity.

Music distribution - Structural change in the global music industry

A dramatic structural change is sweeping the global music industry with music distribution going digital and mobile worldwide. Licensed digital distribution of music and mobile music are buzzwords in the industry, and dominate music distribution in the physical form, which may barely exist in a few years.

Sharp transition of music from physical to digital platforms has forced music companies to redevelop business strategies and come up with innovative methodologies to package and distribute music content.

Driving forces behind structural changes

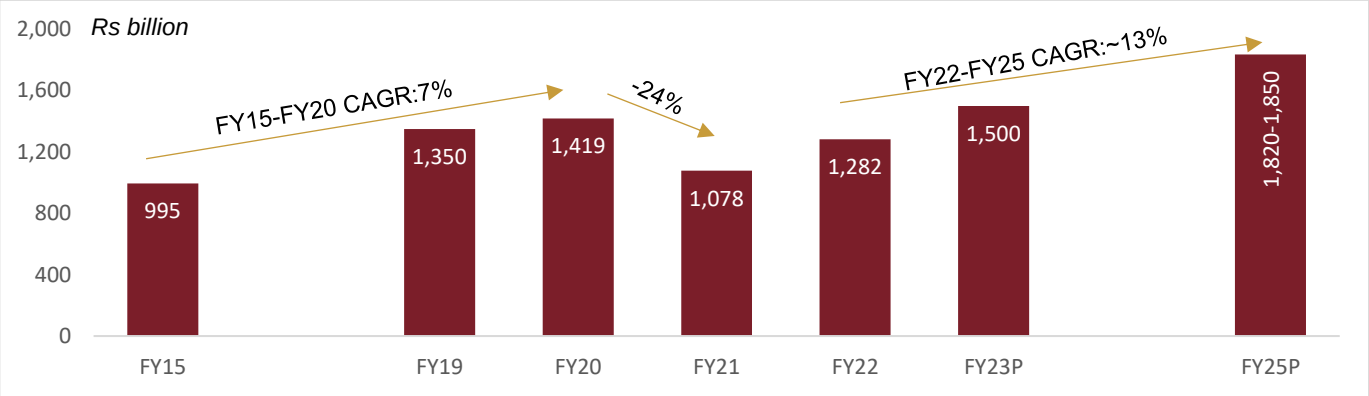
- Increasing penetration of high-speed broadband internet connections and mobile networks, and uptake of high-speed services by telecom operators, with the rising wireless subscriber base
- Increased availability and adoption of mobile handsets, with higher download, storage, and playback capacities (mobile handset companies have made available music-enabled phones specifically targeted at music buffs, who wish to have their choice of music on the go)

- Digitisation of entire music catalogues by players
- Continuous improvements in technical specifications and capabilities of digital players
- Social networking sites (a promotional tool for the Indian music fraternity)

Industry to surpass pre covid levels in fiscal 2023

India's M&E industry steadily expanded at 7-8% CAGR between fiscals 2015 and 2020 and de-grew 24% in fiscal 2021 due to pandemic-related spend cuts. In fiscal 2022, with the broad economic recovery and the revival in the corporate spending the industry grew by ~19%. The industry is at 90% of the fiscal 2020 level as sectors like print, films, and Out-of-home (OOH) failed to achieve complete recovery. In fiscal 2023 with the revenge spending, increase in demand and accelerated digitalization is expected to aid the growth. It is estimated that the industry will grow by 15-20% to surpass the pre-Covid levels. In line with this, the M&E sector is expected to witness CAGR of 13% from fiscals 2022 to 2025.

M&E industry revenue



P- Projected

Source: CRISIL Research

M&E industry segmental revenue (Rs billion)

	FY20	FY21	FY22	FY25P	FY22-FY25 CAGR
Print	299	188	239	302	8%
TV	701	650	704	811	5%
Radio	25	13	18	30	19%
Digital	140	162	211	393	23%
Films	194	23	59	216	54%
Outdoor	32	15	19	33	19%
Music	28	28	32	51	17%
Total	**1419**	**1078**	**1282**	**1835**	**13%**

Note: P- Projected

Source: CRISIL Research

M&E industry revenue stream (Rs billion)

	FY19	FY20	FY21	FY22	FY23P	FY25P
Ad revenue	700	699	547	701	829	1057
Subscription revenue	649	720	531	581	671	778

Note: P- Projected

Source: CRISIL Research

Advertising revenue to witness a strong growth in fiscal 2023

The total advertising revenue in the M&E industry grew by ~28% in fiscal 2022 to reach ~Rs. 700 billion. This was on account of the revival of the economy and the increased demand across major sectors.

In fiscal 2023, with revival in ad spends and the increasing preference for the digital advertisement the advertising revenue is expected to show a strong growth. Ad revenues are estimated to grow 16-20% % on-year in fiscal 2023 lead by TV, digital revenues which account for more than 70% in fiscal 2022.Ad revenues for films is also expected to show a strong recovery on account of increase in footfall in film exhibition halls. The digital revenues to lead the growth in this fiscal year, it is expected that the digital advertising revenue will grow by 23-26% in fiscal 2023.

In fiscal 2024 the revenues is expected to grow by 13-18% to touch ~Rs.940-950billions mostly driven by revival in macro-environment leading to higher ad spends, growth in newer avenues of advertising like digital media. During fiscal 2022 to fiscal 2025 ad revenues are expected to grow by 13-17% CAGR.

Ad spends to drive growth (Rs billion)

Rs billion	FY15	FY19	FY20	FY21	FY22	FY23P	FY25P
TV	182	297	282	236	292	326	377
Print	164	214	207	120	156	182	205
Film	4	11	13	1	4	12	20
Digital	41	117	140	162	211	264	393
Outdoor	23	33	32	15	19	23	33
Radio	16	28	25	13	18	23	30
Total	**430**	**700**	**699**	**547**	**700**	**830**	**1,058**

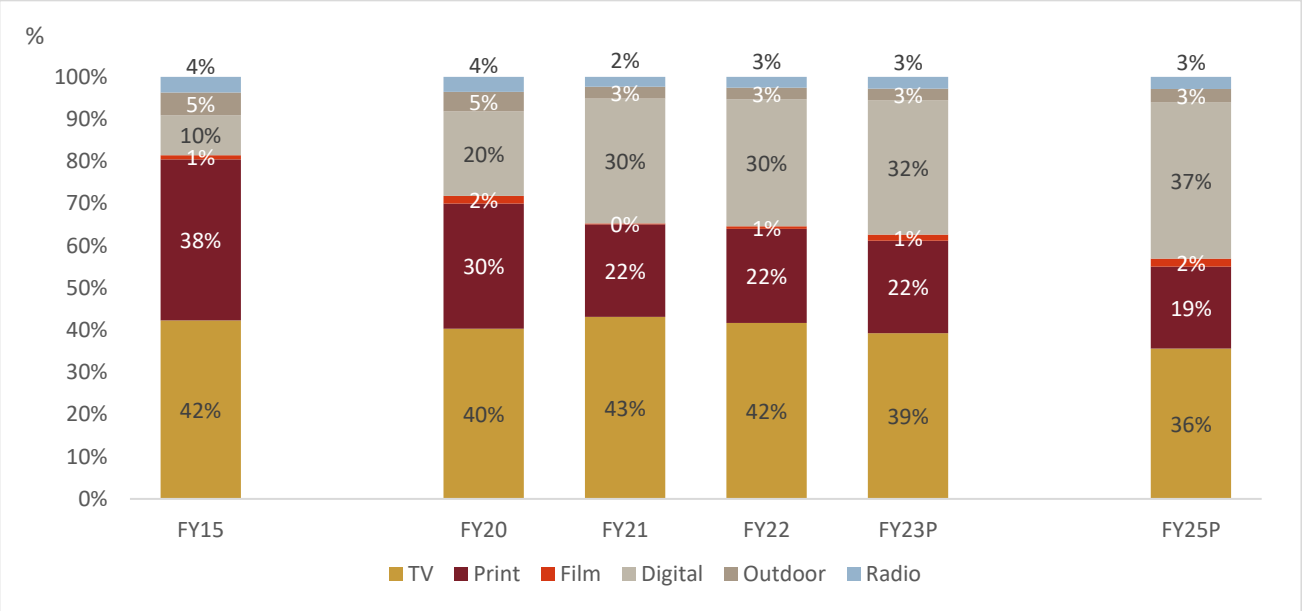
Note: P- Projected

Source: CRISIL Research

Digital ad spending to surpass the TV Spends by FY25

CRISIL Research believes the share of digital advertising in total ad spend will rise to ~37% by fiscal 2025 from ~29% in fiscal 2021. Digital media spend has risen significantly in recent times, as companies are allocating a larger portion of their ad budgets to target a growing population of tech-savvy consumers. The share of print media is likely to decline to ~19% by fiscal 2025 from ~22% in fiscal 2022, in line with the global trend. Television will remain the preferred medium for advertising, given its reach across a wide target audience however shifting preference to digital will impact of TV share as well.

Break-up of past and projected ad revenue



Note: P- Projected

Source: CRISIL Research

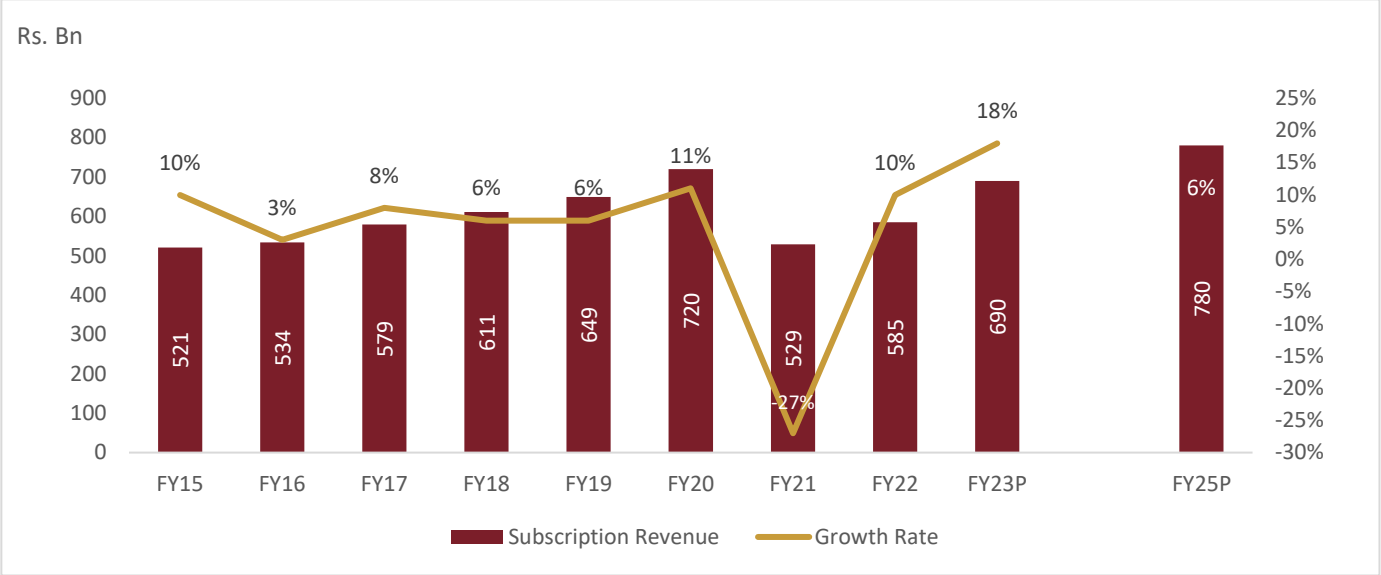
M&E subscription complete recovery beyond fiscal 2023

Subscription (non-advertising) revenue grew by ~9% in fiscal 2022 to reach Rs. 581 billion. The growth was led by the recovery in Television segment.

Subscription (non-advertising) revenue is expected to grow by 13-18% on-year to reach ~Rs 565-575 bn in fiscal 2023 lead by recovery in TV, print, films, and radio segments. This is on account of the with improved economic conditions reviving spends to recreation Over medium term, subscription revenues are expected to reach ~Rs 780 trillion by fiscal 2025, growing at a ~8-12% CAGR between fiscals 2022 and 2025, due to following factors:

- Continuing growth in theatrical collections of movies owing to the rising number of multiplexes in Tier-2 and -3 cities and moderate rise in ticket prices, along with rising revenue from ancillary streams such as cable, satellite and digital rights
- The shift towards over-the-top (OTT) platforms will widen the digital television subscriber base. Increased availability of regional and original content on digital platforms coupled with a shift to a subscription-based model by players will drive the segment's growth
- Growth in the music industry, aided by increase in digital revenue, driven by a push from bundling by telcos as well as the growing number of standalone-streaming applications.

Subscription revenue to recover at a moderate pace this fiscal after a sharp decline in fiscal 2021



Note: P- Projected

Source: CRISIL Research

Television holds largest share in M&E industry; will continue to dominate

Television contributed to nearly 50% of the M&E industry's revenue in fiscal 2020. Fiscal 2021 saw the share of the television segment increase as revenues from other segments such as films and radio were impacted due to lockdown restrictions during the pandemic. Television is expected to maintain its lion's share in the M&E industry with 46% share in fiscal 2025.

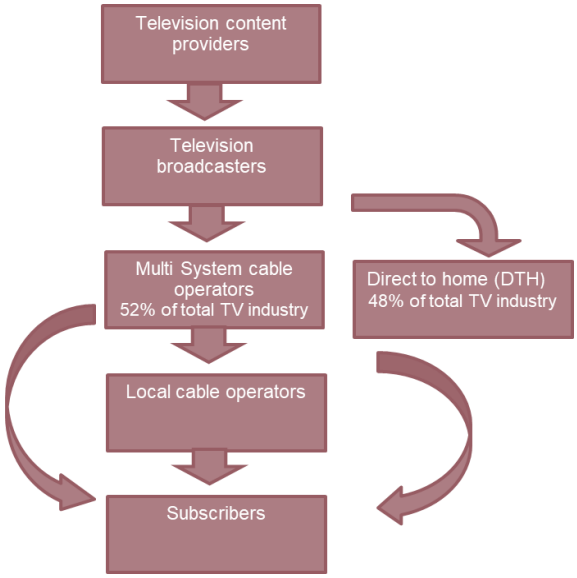
M&E industry segment share (%)

	FY20	FY21	FY22	FY25P
in %				
TV	49%	60%	55%	46%
Print	21%	17%	19%	17%
Film	14%	2%	5%	12%
Digital	10%	15%	16%	19%
Outdoor	2%	1%	1%	2%
Radio	2%	1%	1%	2%
Music	2%	3%	2%	3%

Note- P- Projected

Source: CRISIL Research

Television value chain is highly fragmented and unorganised; slowly moving to digital viewing platforms



Source: CRISIL Research

Key listed players in the categories are

Value chain players	
Content providers	Balaji Telefilms Ltd, Endemol, Optimystix, Hats Off Productions, Cinevistaas, etc
Broadcasters	TV 18 Ltd, New Delhi Television Ltd, Sahara One Media and Entertainment Ltd, Sun TV Network Ltd, TV Today Network Ltd, Zee Entertainment Enterprises Ltd, Zee Media Corporation Ltd, and Star India Pvt Ltd
Multi-service operators (MSOs)	Den Networks, Hathway Cable & Datacom, Siticable, Asianet Digital Network Ltd, NXT Digital Ltd, Kerala Communicators Cable Ltd
DTH operators	Dish TV India Ltd, Airtel Digital TV, Tata Sky, etc.

Source: CRISIL Research

Content producers, broadcasters, delivery platform operators (DPOs) and end-consumers constitute the value chain of the television industry. Content producers develop content for broadcasters, who uplink to satellites for distribution to end-consumers through DPOs. DPOs include multisystem operators (MSO), local cable operators (LCO) or direct to home (DTH) operators. The regulation of content is divided across different authorities and self-regulatory organisations. The broadcasting and distribution segments are regulated by the Ministry of Information & Broadcasting (MIB) and the Telecom Regulatory Authority of India (TRAI), respectively. DPOs in India comprise cable operators, DTH operators, including Doordarshan's free satellite services, Internet Protocol Television (IPTV) operators and one Headend in the Sky (HITS) operator.

TV content industry has low entry barriers in general entertainment

The television content business, especially general entertainment programming, is characterised by the presence of a large number of content houses and low entry barriers. Entry barriers are relatively higher in the case of niche content, where exclusivity and intellectual property rights (IPRs) are involved (for example, sports).

Types of television content

- **Commissioned programmes**: The broadcaster commissions a TV content provider to produce a programme in return for a telecast fee. In most cases, the broadcaster retains the IPRs for the programme. It earns revenue by selling airtime to the advertiser. The content producer typically works on a cost-plus-margin basis. Thus, the broadcaster bears the financial risk, while the content producer bears the execution risk.
- **Sponsored programmes**: The content producer buys a slot from the broadcaster for telecasting a programme by paying a telecast fee. Along with the slot, the producer also gets some free commercial airtime. Here, the content producer usually retains the IPR for the programme. The excess/ deficit of revenue earned from selling commercial airtime to advertisers over the telecast fee, production cost of the programme and any other related cost represents the profit/loss to the producer. The content producer thus bears the financial as well as the execution risk in this model.

TV broadcasting can be divided into two segments

The Indian broadcasting industry can be segmented into terrestrial and satellite:

- Terrestrial broadcasting: Here, broadcasting is done through transmitters and received through antennas. The government owned Prasar Bharti Corporation is the only terrestrial TV broadcaster in India, which operates channels in Hindi, English, and several regional languages under the umbrella brand 'Doordarshan', free of cost.
- Satellite broadcasting: This refers to broadcast through a satellite transponder. Equipment required for reception of TV signals include dish antennae, amplifiers, modulators, and decoders. C&S channels can be further categorised into general entertainment (GEC), regional, movie, news, sports, educational and spiritual. C&S channels are either free-to-air (FTA) or pay channels.

Subscribers receive the broadcast content through four distribution platforms:

i. Digital cable TV (Digital Addressable System) through MSO/ LCOs

ii. DTH (Direct to Home)

iii. HITS (Head end in the Sky)

iv. IPTV (Internet Protocol television)

All subscribers in India have converted from Analogue system to Digital Addressable Systems in 4 phases ending on March 31, 2017. Digital Addressable System enabled the distribution platforms to offer higher number of channels to subscribers in the range of 400- 500 channels with much better clarity. Most importantly, the subscriber can choose the channels / bouquet of channels as per the requirement of subscriber.

Revenue streams for distributors

Distributors such MSOs have the following revenue streams:

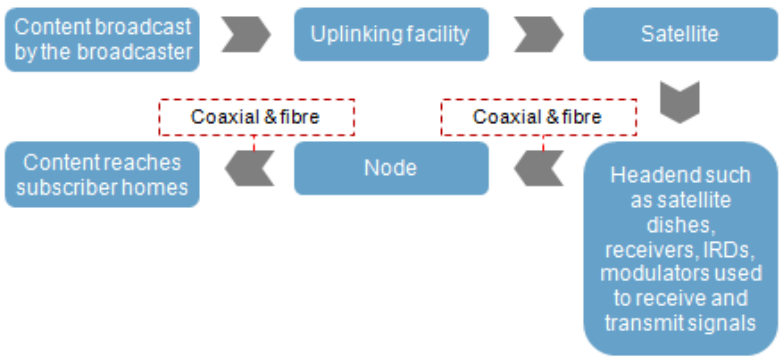
1) Subscription:
   i. Network Capacity Fee
   ii. Distribution fee from MRP of pay channels
   iii. Discounts/ Incentives from Pay Broadcasters on the subscription
2) Carriage Fee / Placement Fee from broadcasters.

TV distribution value chain

The TV distribution value chain comprises:

- Broadcasters, who uplink content provided by content providers to the satellite
- MSOs or their franchisees, who downlink satellite signals and feed them into receivers, in case of an FTA channel or integrated receivers and decoders (IRDs), in case of a pay channel. In case of DTH, the DTH operator plays a role similar to an MSO, though the content is then beamed directly to the customer's premises). Both MSOs and DTH operators encrypt the channels at their headend which is decrypted by the Set top box (STB) at the customer premises.
- LCOs, who control the hybrid fibre coaxial cables that transmit television signals, modulate the output from the receivers or IRDs and bring the signals to the customer's premises and the STB decrypts the signals which is fed to the television.

Television delivery mechanism



Source: CRISIL Research

Brief overview of multi system operators (MSOs)

Introduction

Cable television came into existence in India in 1983 when Doordarshan started its services on cable networks in the rural areas of Rajasthan. During the 1990s, the cable and satellite TV broadcast business was largely driven by

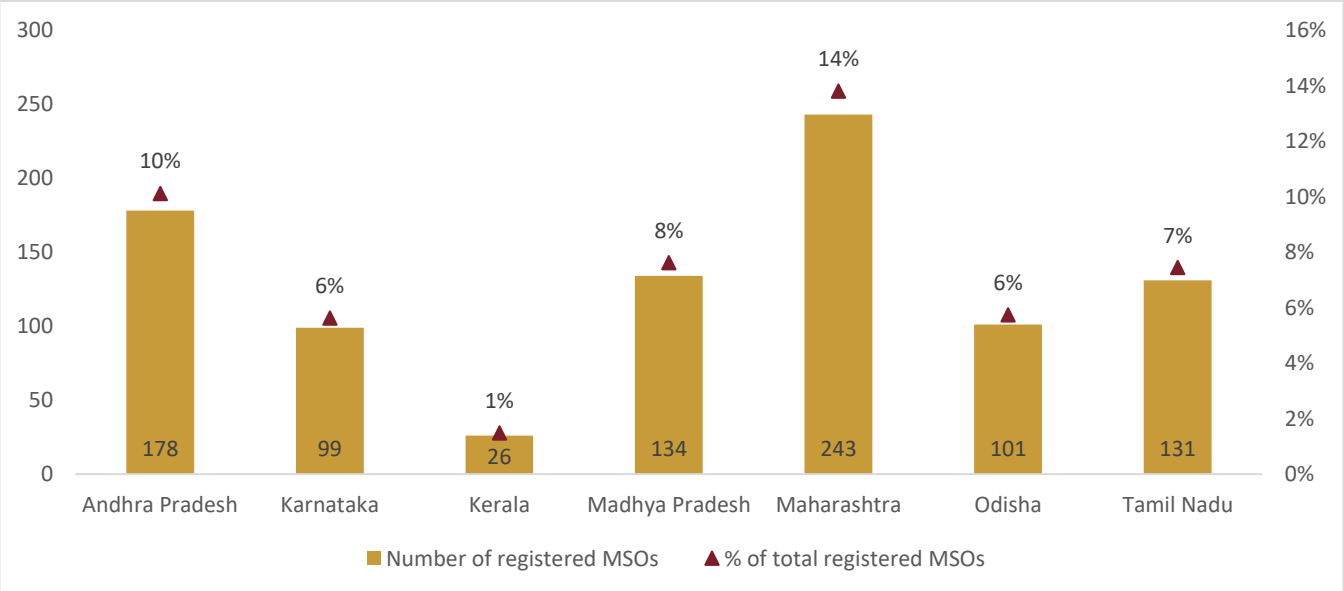
small cable TV operators, each catering to the needs of local subscribers in a small area ranging from approximately 50 to 1,000 consumers. A phenomenal increase in the number of TV channels from year 2000 until 2010 resulted in operational constraints for LCOs. During this period, Multi Systems Operators (MSOs) came into being. MSOs established headends in metros and major towns to receive TV signals from different TV broadcasters, aggregate and distribute these signals to LCOs, who would further transmit it to subscribers through cables. In some instances, MSOs would also provide services directly to their consumers.

The migration from analogue cable TV distribution system began in 2012 and was completed in March 2017. In-line with the progress of digitalisation, the number of registered MSOs steadily increased from 2012 to 2017. The number of operational MSOs out of the total registrations also increased during this period. As of May 2022, there were 1,760 MSOs registered with the Ministry of Information and Broadcasting.

MSOs in the TV distribution chain

MSO refers to a cable operator who receives a programming service from a broadcaster and/or his authorised agencies and re-transmits the same or transmits his own programming service for simultaneous reception either by multiple subscribers directly or through one or more local cable operators (LCOs) and includes his authorised distribution agencies. MSOs or their franchisees downlink satellite signals and feed them into receivers in case of an FTA channel, or integrated receivers and decoders (IRDs) in case of a pay channel. In case of DTH, the DTH operator plays a role similar to an MSO, wherein the content is beamed directly to the customer's premises.

State-wise registered MSOs



Note: Data as of May 2022

Source: Ministry of Information and Broadcasting, CRISIL Research

Investments and infrastructure required for MSOs

An MSO has to make substantial investment for setting up the headend(s) and other components of the network. Further, additional investment is necessary for expansion of the network. The equipment also requires continuous technology upgradation. In addition, as a business entity, an MSO faces competition from other service providers, thereby necessitating expenditure on marketing, sales and value-added services. The main equipment required by

the MSO for commencing operations are a satellite receiver and distribution equipment, Headend equipment, including Conditional Access System (CAS) and subscriber management service (SMS). In addition, the MSO needs to invest in customer premises equipment and the rolling stock of other transmission and field items. The nature of competition in the market as well as high upfront investment can ensure that only firms having adequate financial strength enter the field.

Key points in the regulatory framework for MSOs

- Companies operating in the cable TV network as MSOs have to register themselves with the Ministry of Information and Broadcasting
- The operation of cable television is governed by the Cable Television Network Regulation Act, 1995 (CTN Act) and rules made thereunder. MSOs/LCOs providing platform/programming services must make full disclosure on the ownership status and should comply with the Programme and Advertisement Code featured in the CTN Act and Rules while providing platform services.
- The following regulations ("2017 Regulations") govern the MSOs/ DTH/ IPTV / HITS operators:

  Telecommunication (Broadcasting and Cable) Services (Eighth) (Addressable Systems) Tariff Order, 2017

  The Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) Regulations, 2017

  The Telecommunication (Broadcasting and Cable) Services Standards of Quality of Service and Consumer Protection (Addressable Systems) Regulations, 2017 ("QOS Regulations")
- The broadcaster/MSO cannot supply signals to the MSO/LCO without entering into a written agreement.

Television: Comparison of transmission modes from the subscriber point of view

Parameter	Analogue TV	Digital cable	Direct-to-home	IPTV
Mode of delivery	Existing coaxial cable network	Existing cable network and digital headend	Satellite	Broadband network
Customer premise equipment	Not required as LCOs deliver television signals through a single cable.	Subscribers have to purchase or rent a STB for viewing pay channels	Subscribers have to buy a dish antenna and a STB. Television signals are delivered directly from the satellite.	Television signals are delivered to the subscriber through a broadband connection and a STB.
Customer choice	Not available. Subscribers have to watch whatever channels the LCO supplies.	Subscribers can watch more channels even on a standard television set with a digital STB. CAS gives subscribers the freedom to choose the channels they want to subscribe to.	Theoretically, subscribers can select the channels they want to watch and accordingly pay for them.	Customers can only watch the channels made available by the service provider.
Viewing FTA/pay channels	All FTA and pay channels beamed into homes can be viewed.	Pay channels cannot be viewed without STB. However, FTA channels can be seen (without STB).	STB is required for viewing any channel, whether FTA or pay.	An STB is required for viewing any channel, whether FTA or pay.
Number of channels	A maximum of 106 channels can be offered with the bandwidth available.	Possible to offer more than 1,000 channels with complete digitalisation	Limited by the number of transponders available.	Not available
Localised programming	Available	Available	Not available	Not available
Quality of transmission	Poor compared to digital cable and DTH at most times	The picture and audio quality would better than analogue cable and on par with DTH.	Superior audio and video quality compared to analogue cable. However, performance may get adversely affected in case of rains or thunderstorms.	Good. But has not yet been tested on a critical mass of subscribers.
Value added services	Most networks are not two-way. But several LCOs are offering Internet services to their subscribers through cable modem technology, or an Ethernet wire and a LAN card.	Internet services are being offered as a separate service to subscribers. The STBs made available to subscribers do not incorporate the reverse path for two-way connectivity.	DTH STBs do not have two-way connectivity for offering internet services. However, services such as video on demand, electronic programming guide and personal video recorder are being offered to subscribers.	Telephone, broadband internet and television being offered through a single connection. Value added services such as video on demand and time shifting also being offered by MTNL.
Pricing	Rs 130-400 per month depending on the channels added	Approximately Rs 130-500 per month	Approximately Rs 130-500 per month	Subscription fee of Rs 199 per month and rental of Rs 100 per month towards STB
Customer service centralisation	Decentralised. LCOs available to address any issues. But customer service levels at times leaves a lot to be desired.	Decentralised. Similar to analogue cable.	Customer complaints have to be reported to a centralised facility.	Somewhere between DTH and cable television

Source: CRISIL Research

OTT emerging as an important media consumption platform

Over-the-top (OTT) has emerged as an important media consumption platform in the last few years and players across the TV value chain have looked to establish their presence on this platform.

Advertisement spend in the digital medium is likely to grow due to the medium's ability to reach the target audience. Boundaries between different layers of the digital video value chain are blurring as players are looking to build end-to-end competencies to reach their consumers. Traditional TV content producers such as Balaji Telefilms (Balaji ALT), Star TV (Hotstar) are launching their own platforms. Hotstar (Star TV) and VOOT (Viacom 18) are amongst the leading OTT video platforms in India after YouTube. In 2016, two large international Video-on-Demand (VoD) players, namely Netflix and Amazon Prime Video launched their services in India.

However, the threat from OTT to television is minimal as TV still remains an extremely affordable medium of entertainment in the country.

Increasing mobile data consumption to fuel growth in video consumption via streaming

VOD services are evolving rapidly ever since the rollout of 4G services, and improvement in data speed and quality coupled with low pricing. Reliance Jio’s entry into the telecom space led to an increase in the number of internet subscribers. There has been a surge in demand for VOD services, as more consumers are gradually drifting from television to online viewing. As per the industry, videos account for more than two-thirds of the total mobile data traffic in India. The share of video streaming is expected to continue to increase, driven by availability of OTT apps. In addition, the availability of regional content on these apps and cheaper data tariffs are likely to lead to higher data usage for watching videos.

Convenience of OTT apps leading to shift in viewing habits

OTT services offer the flexibility to watch content irrespective of the place and time. This has led to a shift in viewing habits, as consumers can watch content at their discretion instead of being forced to watch what is being telecast on television. Curated and short-period content is promoting binge-watching among commuters and youth in urban areas. Cheaper data tariffs have led to increased viewership of content in non-urban areas as well, resulting in increased reach of the OTT apps.

Telco partnerships give OTT players immediate access to a large subscriber base

For wider distribution of OTT content, players have entered into partnerships/tie-ups with telcos as well as mobile / TV manufacturers. While telcos provide them with large data subscriber base that would readily view content online, mobile and TV manufacturers provide pre-loaded apps / channels to users driving more usage. However, in the existing revenue models for telco partnerships, OTT players offer a discounted rate per subscriber vis-à-vis their standalone subscription rates, thus realisations per subscriber are lower. Nonetheless, subscriber acquisition via telco partnership is quick and sticky, as some of the telcos bundle OTT services for their premium/post-paid customer base. Taking the case of AltBalaji, the subscription revenue per user received from telcos is ~60% of standalone subscription fee.

Traditional TV still favoured over OTT apps

Factors such as affordable data plans, bundling of OTT content by telecom players and availability of original content are set to drive OTT adoption in India. However, lack of a stable internet connection, low fixed line broadband penetration and piracy issues will be some of the challenges that hinder large-scale adoption of OTT apps in the near future. Also, in rural areas, television is still the go-to medium of entertainment.

Rise in free-to-air channels

Free-to-Air (FTA) channels gained momentum in 2016 as ad rates for these channels increased by 50-60% during the year. These channels are broad-based, covering Hindi movies, news (Hindi and regional), music and kids genres. The channels provide the broadcaster a robust way to widen their reach and achieve viewership for GEC in relatively less time with the added incentive of cost-effectiveness in comparison with a 'Pay' GEC.

Key channels available on free-dish

Genre	Channels
Hindi GEC	DD National
Hindi movies	Maha Movies, B4U Movies
News	ABP News, DD News, News Nation
Kids	Maha Mazza Hindi Cartoon
Music	9X Jalwa, Mastii
Shopping	ShopCJ, Homeshop 18

Source: CRISIL Research

Revenge spending by corporate to help in the revival of the TV industry

The TV industry's revenue is expected to grow at ~5% CAGR between fiscals 2022 and 2025

Industry to witness growth in ad revenues and muted growth in subscription revenues

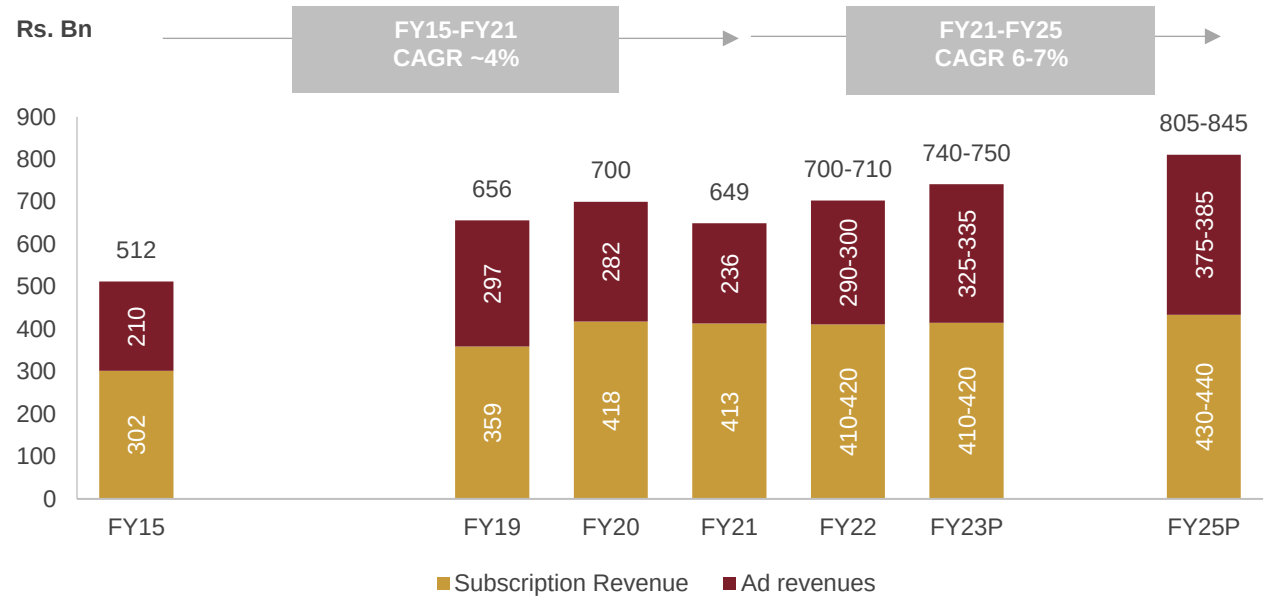
In fiscal 2022, Overall TV industry revenue grow ~8% on-year to reach ~704 billion. This is due to healthy growth of subscription revenues and advertisement revenues.

In fiscal 2023, we expect the Television industry revenue to grow by 3-7% to reach Rs.740 billion with ad revenues growing 10-15% as new advertisers are coming into the space and television remains the most preferable mode of advertising. The recovery in advertising revenues was volume driven. We expect subscription revenues to stay flat with 0-2% growth owing to up trading of channel packs by subscriber along with reduced churn in subscribers.

The TV industry's revenue is expected to clock a growth rate of 5% CAGR to ~Rs.810 billion from fiscal 2022 to fiscal 2025 mainly due to the New tariff order 2.0 amendments is likely to be deferred owing to the pandemic, however, the implementation of the same is expected from fiscal 2023 which is likely to drag down overall subscription revenues.

Currently Television accounts for 42% of the ad revenues but the share of television in total ad revenues will decrease in the medium term as there is a shift from television to digital advertising given the rise in internet subscribers in India.

Share of ad revenue and subscription revenue in the TV industry



Note: P- Projected

Source: CRISIL Research

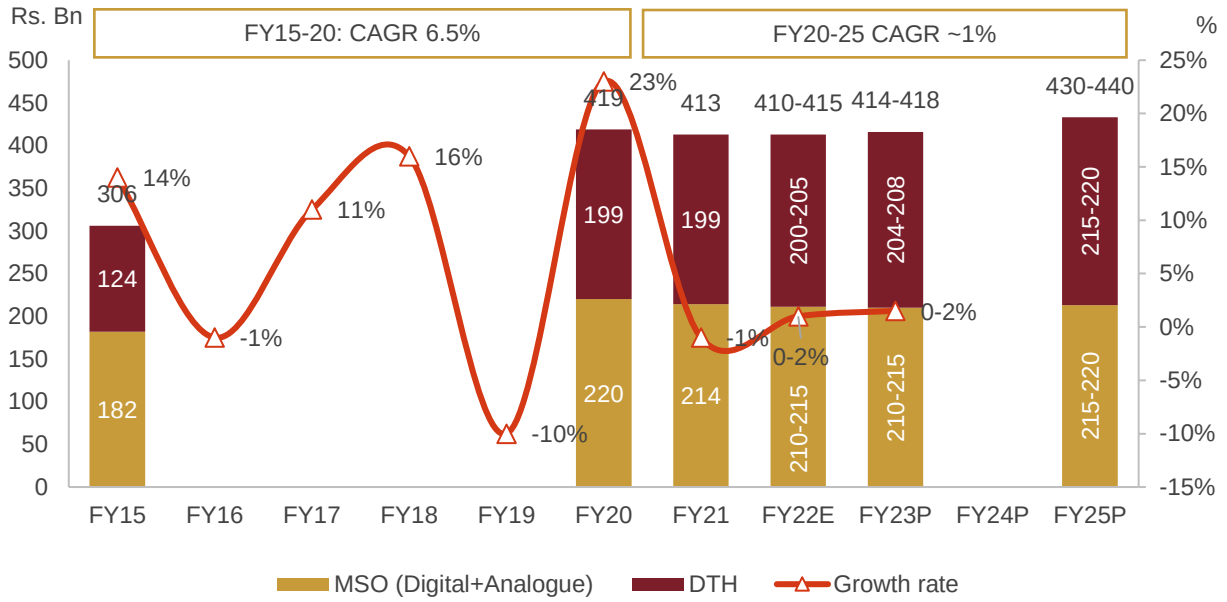
Subscription revenue will witness flattish growth amid pressure on subscriber additions

The subscription revenues remained flat in FY22 as there were heavy pressure on Television subscriptions and customers shifting towards Free DD dish and affordable OTT platforms.

The subscription revenues to grow marginally in Fiscal 2023 to reach ~Rs.415 billion on account of muted subscriber addition.

The New Tariff Order 2.0 which will bring the price transparency and reduce the ambiguity among the stakeholders will be implemented from June 1, 2023.The implementation of the NTO 2.0 is expected to encourage customers to choose for individual channels instead of bouquets, resulting in lower customer pay-outs and loss of subscription revenue for big broadcasters, while there will be a marginal impact on TV distributors as they still have their fixed Network capacity fees, which forms majority of their revenue.

Revenue for TV distribution with share of MSO and DTH



Note: P- Projected

Source: Company reports, CRISIL Research

NTO 2.0 implementation to put brakes on subscription revenue growth in fiscal 2023

The earlier tariff order was successful in bringing transparency in channel pricing and reducing ambiguity among stakeholders. However, the major objective, i.e., of customers choosing to pay for what they watch instead of broadcasters or distributors pushing unwanted channels, remained unfulfilled. Large broadcasters offered huge discounts on bouquets and priced their popular channels disproportionately higher to encourage subscribers to choose bouquets instead of individual channels. This enabled broadcasters to push their less popular channels, along with driver channels, in their bouquets. As a result, the penetration of a la carte channels was less than 10% even after the implementation of the NTO. Big broadcasters benefitted from this and saw a surge in subscription revenue, while smaller broadcasters with single channels lost out on subscribers.

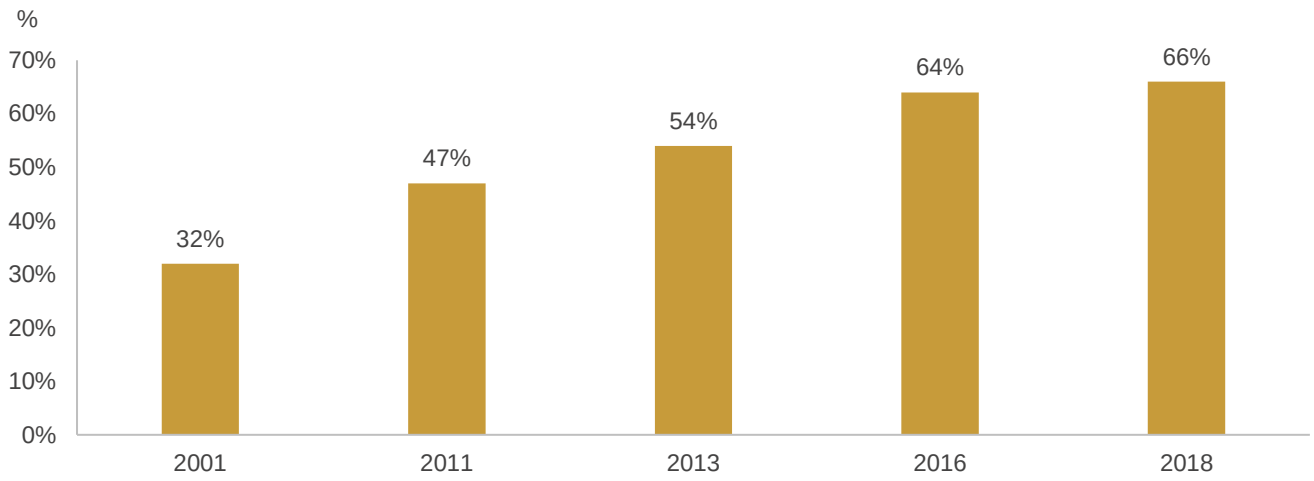
To protect the interest of smaller subscribers and to increase the penetration of a la carte channels, the Telecom Regulatory Authority of India passed amendments to the NTO. In a nutshell, the order capped broadcasters' discount at 33% and put conditions that restrict broadcasters from offering too many bouquets.

The amendments are expected to encourage customers to choose individual channels instead of bouquets, resulting in lower customer pay-outs and loss of subscription revenue for big broadcasters. TV distributors are likely to see a marginal impact as they still have fixed network capacity fees, which constitute most of their revenue.

TV penetration on a continuous rise in India

TV-owning households in the country represent about two-thirds of all households. Notably, this number has doubled over the past two decades. According to estimates by Broadcast Audience Research Council India, TV penetration in India increased to around 66% in 2018 from 32% in 2001.

TV penetration in India



Source: Broadcast Audience Research Council of India TV Universe Estimate 2020, CRISIL Research

Number of homes with TV access (in million) in key states

	2018	2020	% Change	TV penetration
Andhra Pradesh	23.2	24.6	6.0%	NA
Karnataka	15.3	16.1	5.2%	1.1
Kerala	8.2	8.6	4.9%	1.0
Maharashtra	23.7	25.5	7.6%	1.0
Odisha	6	6.8	13.3%	0.6
Tamil Nadu	21.7	22.6	4.1%	1.1
Madhya Pradesh	15.3	16.4	7.1%	NA

NA: not available; TV penetration is calculated on a per-household basis

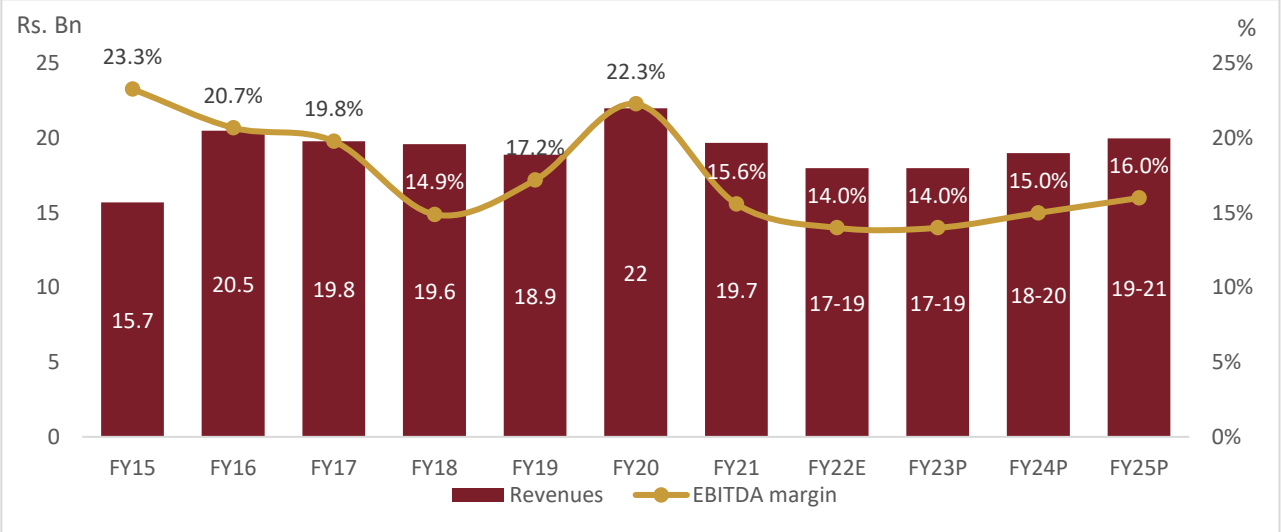
Source: Broadcast Audience Research Council of India, CRISIL Research

MSOs' operating margin to contract as subscriber base to remain muted

In Fiscal 2022 the average revenue per user (ARPU) of major MSOs decreased by 1% and 3% on year. The subscriber base also fell by 5% on year in fiscal 2022.

In fiscal 2023, we expect the (ARPU) of major MSOs to remain under pressure. Subscriber base additions is also expected to be under pressure as customers shift focus to DTH, DD Free Dish and affordable OTT platforms. The major expense Content cost (~60% of total cost) and other expenses are expected to rationalize as revenues grow 1-4% on year. Up-trading of channel packs will also aid growth resulting in margins expansion of 60-100 bps to touch 14-16%. In Fiscal 2024, with the sustainable cost cutting strategies like sharing of infrastructure we expect the margins to expand by 80-100 bps.

MSOs' operating margins to expand ~800-850 bps due to higher realisations after NTO



Note: Includes financials of DEN Networks and Siti Cables

Source: Company reports, CRISIL Research

After fiscal 2016, improvement in MSOs' financial health became more evident owing to factors such as higher revenue, with digitisation enabling more transparent reporting, improvement in EBITDA margins and uptake of HD channels boosting ARPU. In fiscal 2019, the MSO industry struggled during implementation phase of the New Tariff Order. Except for a few large players, others struggled to comply with the order due to lack of technical infrastructure which was imminent under the new order due to increased transparency requirements. Even the larger players were impacted due to lack of adequate infrastructure with their LCO partners. This led to a loss of over 5 million subscribers for Hathway, Den and Siti Cable – top three MSOs. The players had to raise additional debt to build the required infrastructure which further weakened their credit profiles.

With customer pay-outs going up under the new order, operating profits improved resulting in improved credit metrics in fiscal 2020. In fiscal 2021, despite fall in revenues the operating margins improved on account of cost rationalisation. Den network achieved its zero-debt objective. Thus, both total interest and debt fell for the players resulting in fall in interest coverage while rise in debt to EBITDA.

TV distributors on a slow track to recovery, bundled service providers to see renewed interest

The revenue of DTH players is expected to stay flattish at 0-2% on-year in fiscal 2023 due to only marginal subscriber additions, with downtrading of channels capping the upside. The marginal subscriber additions are due to cross-selling as most of the distributors are offering bundling services of OTT platforms and IPTV along with regular TV services, these players are likely to see rise in subscriptions. The new tariff order will bring a fixed source of income for multiservice operators (MSOs) and direct to home (DTH) players in the form network capacity fee.

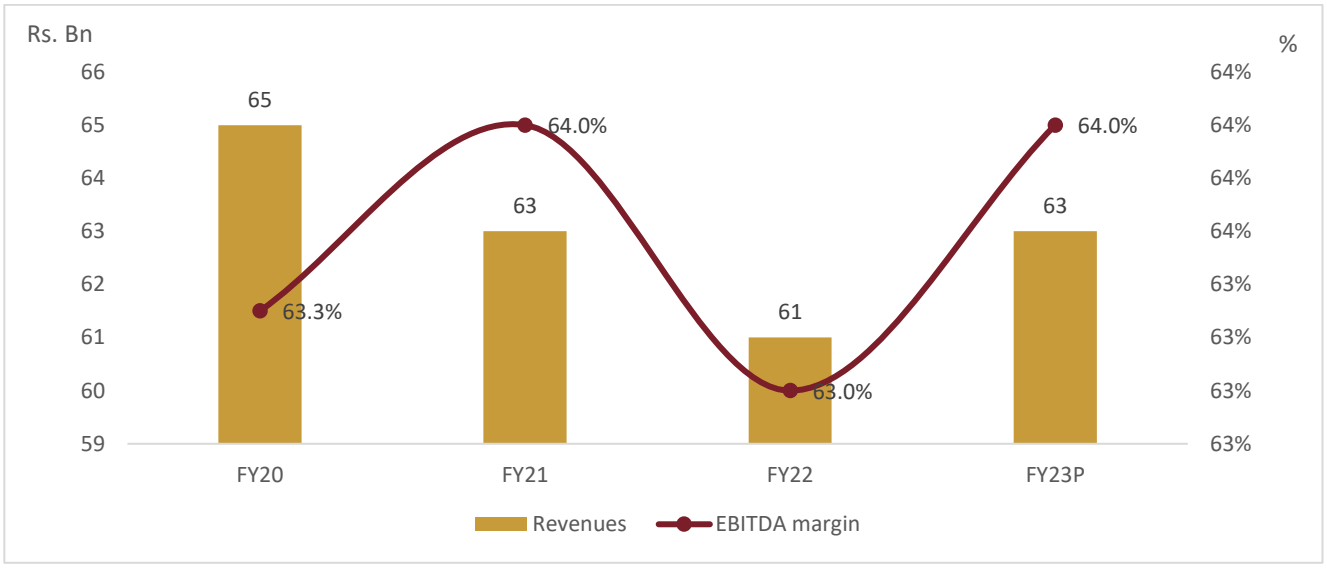
Operating profits for DTH industry fell in fiscal 2022 due to pressure on subscriber additions; Cost control measures to help in margin expansion for fiscal 2024

In fiscal 2022 there was marginal contraction in the operating margins due to pressure on subscriber additions and revival in the expenses. The shift by consumers to DD free dish and affordable OTT platforms lead to muted subscriber additions.

In fiscal 2023, CRISIL Research expects a marginal expansion in operating margins by 0-50 bps on account of improving revenue trajectory as there will be subscriber additions. Since there is intense competition among the players the DTH operators they tend to improve the customer experiences and will continue to focus on bundled services.

In fiscal 2024 CRISIL Research expects a margin expansion of 230-250bps on account of the strong control over the operating expenses.

DTH player margins



Note: Includes financials of Dish TV, Airtel digital TV

Source: Company reports, CRISIL Research

DTH players see a fall in subscriptions

DTH subscriber base dropped to ~68.89 million in September 2021 from ~70.70 million in September 2020.This translates to a decline of 3% in the subscriber base for the pay DTH operators over a year. The subscribers are moving towards free DD dish and to OTT platforms on account of parity pricing between linear feeds on TV and on OTT.

Market share of DTH players

	Jun'19	Mar'20	Jun'20	Sept'20	Mar'21
dishtv	31%	29.49%	28.67%	27.00%	24.09%
airtel	23%	23.65%	23.85%	24.59%	25.54%
TATA SKY	32%	32.33%	32.09%	32.58%	33.30%
SUN DIRECT	14%	14.53%	15.41%	15.83%	17.07%

Source: Company reports, CRISIL Research

Ad spends to bounce back across all sectors; FMCG, E-commerce, education and Telecom spending to support the growth

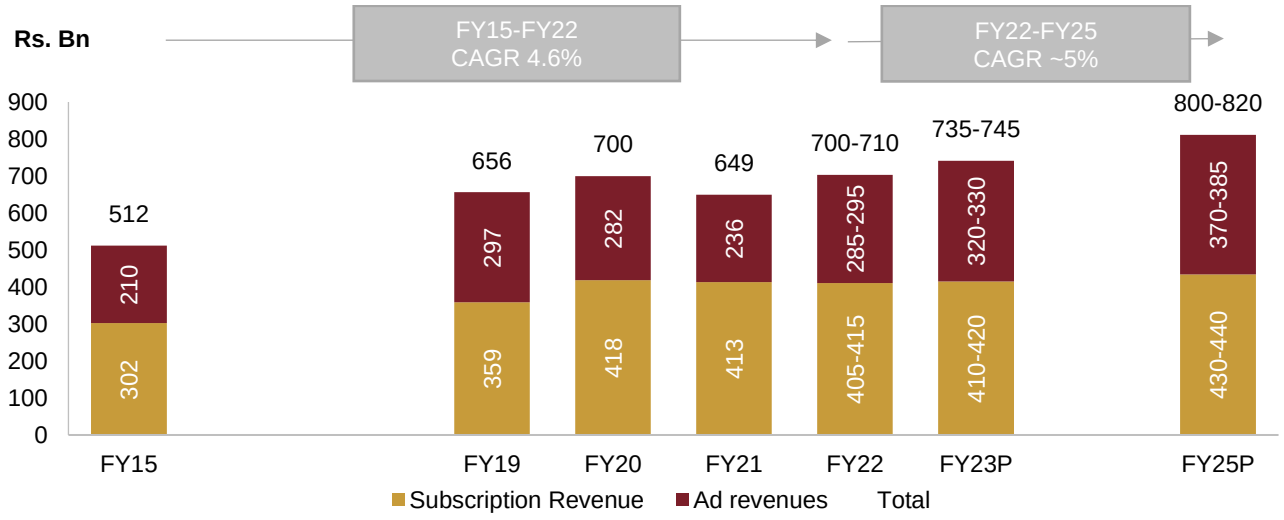
Advertisement revenues grew by ~24% to reach Rs. ~292 billion in fiscal 2022 after witnessing a sharp degrowth of 16% in fiscal 2021.The growth was volume driven the ad volumes crossed the pre pandemic levels in fiscal 2022.

In fiscal 2023, as there is broad economy recovery in all sectors, we expect ad spends to bounce back with growth of 10-15% on-year to reach Rs 320-330 billion on year driven by FMCG, education, e-commerce and telecom.

Ad revenues are expected to grow 8-15% on-year in FY24 driven by increase in ad rates. General entertainment channels are expected to aid the recovery with the strong content pipeline and the availability of more regional and original content.

Over the medium term, we expect the advertisement revenues to post a CAGR of 9% to reach ~Rs.375-385 billion as the digital platforms is likely to take away some share of Television advertising revenues.

Ad revenue and subscription revenue share in the TV industry



Note: P- Projected

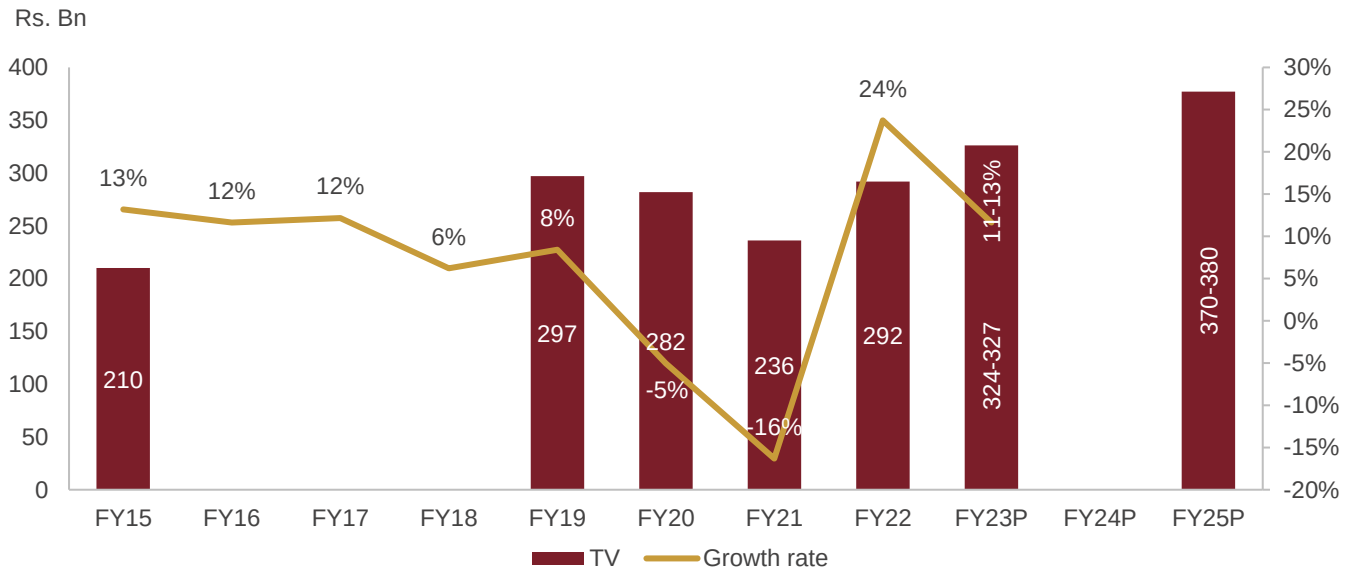
Source: CRISIL Research

Revenge spending by the top sectors

FMCG, E-commerce, telecom, automobiles, and education are the top five sectors, with FMCG contributing to 45-50% and 15-20% by ecommerce platforms. In terms of contribution to television revenues advertising revenue accounting about 40% of the total revenue.

In CY 2021 the ad spends by FMCG which is the largest contributor grew by 10-15% while the e-commerce and education sector grew by ~90% on year. In CY2022, all the top sectors are expected to show double digit growth as there is broad economic recovery. The growth in telecom sector is on account of implementation of 5G networks and education will be on the increasing prominence of the online classes.

Improvement in ad volume to aid growth in fiscal 22 and fiscal 23



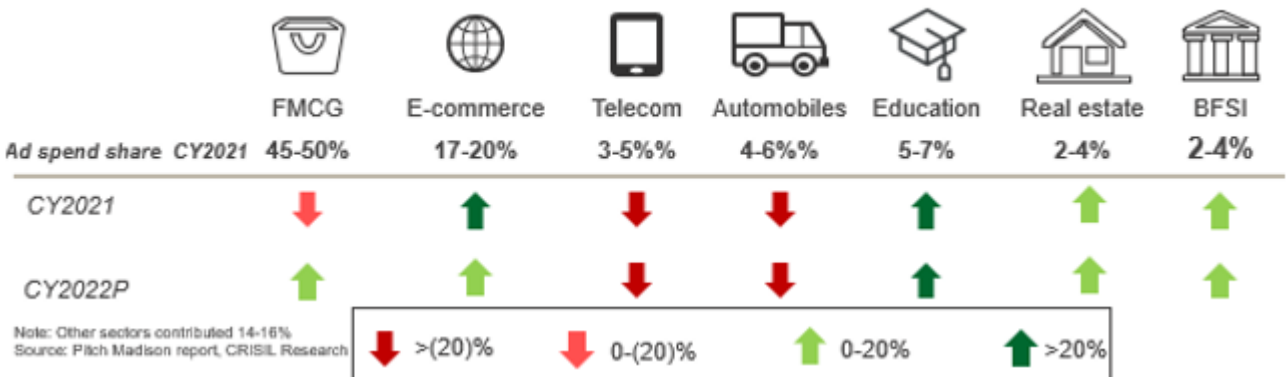
Note: P- Projected

Source: CRISIL Research

Ad spends crash in calendar year 2020; e-commerce, education and BFSI continue to grow

FMCG, E-commerce, telecom, automobiles, and education are the top five sectors, in terms of contribution to television advertising revenue accounting for two-thirds of the pie market.

In CY 2021, ad spends across FMCG, which contributed the largest to television advertisement revenue de-grew 5-10% on-year. While automobiles and telecom ad spend de-grew 40-45% and 25-30% respectively. The overall decline in ad spends would have been much steeper had e-commerce and education not grown at a robust 90-95% and 190-195% respectively in the same period. Revival is expected in fiscal 2022 with growth in ad spends across all major sectors. Further, sectors such as healthcare are also expected to witness a prominent growth in ad spends in fiscal 2022.



Source: Industry, CRISIL Research

Digitisation in television broadcasting space

Digitisation leads to lower under-reporting in MSOs

The LCOs provide last-mile connectivity, i.e., up to the subscriber's home, and enjoy virtual monopoly in most regions. This, coupled with lack of an addressable system led to huge under-reporting in the cable space with LCOs retaining as high as 75% of the revenues. To reduce under-reporting and provide better services to consumers, the MIB planned a four-phase digitisation schedule, which led to complete discontinuance of analogue transmission by March 2017.

Push to digitise cable networks

In an attempt to bring in order and protect consumer interest in the fragmented and unorganised cable television distribution segment, TRAI (telecom Regulatory Authority of India) first intervened in the cable television distribution segment through its October 2004 tariff order, freezing cable TV rate changes.

In the tariff order, TRAI outlined the following reasons for regulating cable television prices:

- Local cable operators (LCOs) were indiscriminately hiking cable prices, which harmed subscriber interests
- Lack of choice and competition made consumers helpless while dealing with LCOs
- There was no uniformity in prices charged to consumers and payments across the value chain, as these were governed by the capacity to pay and negotiated levels of subscriber base
- Continuous haggling between broadcasters and multiple system operators (MSOs) and MSOs and LCOs over subscriber numbers

Considering the changes that occurred in the industry after its October 2004 order, TRAI passed another order in October 2007 imposing an upper ceiling on cable television pricing (exclusive of taxes) in areas where the conditional access system (CAS) was not made mandatory and notified. This order came into effect from December 1, 2007. To accommodate DTH (direct-to-home) operators, TRAI, in April 2008, asked broadcasters to offer to DTH operators the same bouquets that were being offered to cable operators in non-CAS areas.

The pricing of TV channels was capped at around 50% of the rates from digitally addressable media (digital cable or DTH) in non-CAS areas as per the TRAI order in April 2008. The court subsequently capped the pricing at 42% of the cable rates (revised from 35% as per the TRAI order in July 2010).

Proposition for complete migration to digital addressable systems

In 2010, TRAI proposed a complete shift to digital addressable cable TV systems in a phased manner from analogue cable networks. Digital addressable systems enable consumers to watch high-quality TV content of their choice and can also deliver many more channels to consumers compared with analogue cable.

Digitisation deadline

Phase	Cities covered	Deadline (earlier deadline)	Subscriber base (mn)
I	Four Metros	Oct'12	11
II	Cities with population > 1 million	Mar'13	23
III	Urban municipal areas	Jan'17 (Sep'14)	40
IV	Rest of India	Mar'17 (Dec'14)	70

Source: Ministry of Information and Broadcasting and CRISIL Research

TRAI has recommended that the migration to digital addressable cable TV systems be implemented with a sunset date for analogue cable TV series as of December 31, 2016 in four phases. Phases I, II and III were completed, while the deadline of December 31, 2016 for phase IV was extended and digitisation was completed in March 2017.

Digitisation status: Phase I

Phase I of digitisation was concluded by October 31, 2012; of the four cities targeted by the end of that phase, digitisation was near total in Delhi, Mumbai and Kolkata. However, it was delayed in Chennai due to several pending court cases. Approximately 85 lakh cable set-top boxes (STBs) were installed, the maximum number being in Delhi (34 lakh) followed by Mumbai (26 lakh).

Phase I digitisation status (in million)

Regions	TV households	DTH	Cable
Mumbai	2.7	0.7	1.9
Kolkata	3.3	0.3	2.0
Delhi	3.3	0.9	2.5
Chennai	1.1	0.6	0.5

Source: The Ministry of Information and Broadcasting and CRISIL Research

Digitisation status: Phase II

By March 31, 2013, digitisation phase II was completed in 38 cities across 14 states and 1 union territory; the switch to the digital addressable system was completed in 37 cities, while in Coimbatore, it was held up due to court cases.

Phase II digitisation as of April 2013

Regions	Total households	DTH subscriber	Cable	Percent achieved cable + DTH
Bengaluru	226,828	49,837	133,324	80.75
Ahmedabad	117,859	32,589	35,555	57.82
Hyderabad	89,618	34,467	136,767	191.07
Pune	77,483	43,167	30,540	95.13
Surat	76,035	17,408	34,063	67.69
Jaipur	58,093	25,897	39,075	111.84
Visakhapatnam	53,181	3,712	12,035	29.61
Nagpur	52,858	4,316	42,167	87.94
Lucknow	49,800	13,636	27,560	82.72
Kanpur	45,674	8,103	33,576	91.25
Others	714,468	208,693	431,148	89.55
Total	1,601,306	453,668	984,278	89.8

Note: The above data is for illustrative purpose to show the top cities digitised in Phase II

Source: Ministry of Information and Broadcasting and CRISIL Research

Digitisation status: Phase III

The deadline for Phase III of digitisation was December 31, 2015, and later extended to January 31, 2017 as full seeding of set top boxes did not happen. As per the ministry, 76% digitisation was achieved in phase III areas; the proportion shot up to 86.25% if Tamil Nadu was excluded.

According to the I&B ministry's list, there were approximately 33 million TV households in DAS Phase III areas covering 29 states and 5 union territories.

Digitisation status: Phase IV

Due to the then ongoing court proceedings and unsatisfactory progress of installation of STBs in Phase IV areas, the deadline for Phase IV of digitisation was extended from December 31, 2016 to March 31, 2017. Digital switch-over has already taken place in Phase I, II and III. Phase IV digitisation was the toughest since connectivity became an issue as delivering the STB, installing them at subscribers' houses and activating them was challenging in rural areas.

Phase IV covered approximately 70 million TV homes across India including the biggest TV market like Tamil Nadu (8.15 million homes), Andhra Pradesh and Telangana (7.6 million homes), Kerala (4.77 million homes) and Karnataka with 3.8 million TV homes. States like Madhya Pradesh and West Bengal, where there was a shortage of STBs, slowed down the process of digitisation.

Key risks to M&E players

The media and entertainment (M&E) industry is susceptible to changing tastes and preferences of consumers, led in a big part by technological changes. This chapter assesses key risks faced by players in each M&E segment - newspapers, television, films, radio, outdoor, and music.

Viewership drift from linear to digital platform

TV remains the primary mode of watching content currently. However, with the advent of newer technologies and the race towards digitisation, there has been a viewership drift from linear platforms (TV) towards the digital medium. The entry of Netflix, Amazon Prime Video, and Hotstar in India has significantly boosted the consumption of video on demand (VOD) streaming services. Several new over-the-top (OTT) players have entered the space.

The demand for this type of content is expected to continue to grow in the country, considering the rise in mobile data penetration, which is boosting viewership in new regional and rural markets. Broadcasters are differentiating content such that some are available only on digital, and not on the linear platform. Also, OTT platforms do not have creative restrictions imposed by the government, which attracts youth in large numbers, and thereby, more advertisers to these platforms.

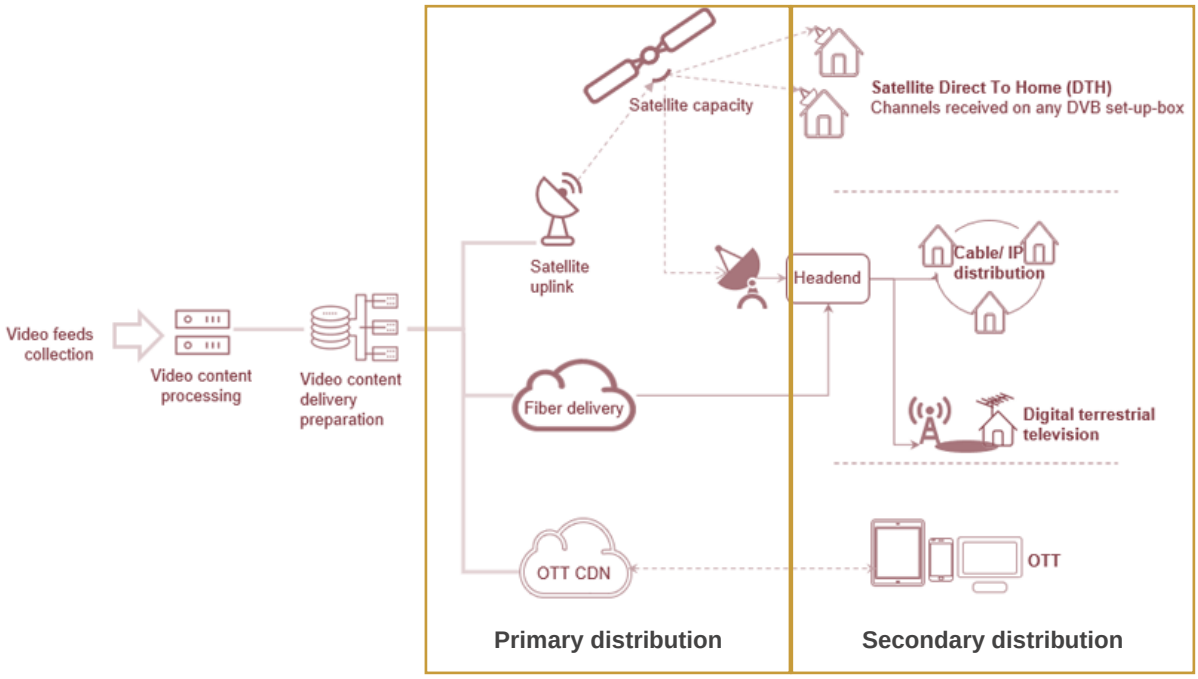
DD Direct gaining more traction

DD Direct has become the country's largest DTH operator in terms of subscribers. The demand for DD Direct comes from rural regions which have nil or limited access to cable networks and cannot afford to pay for DTH services. The company provides 215 TV and radio channels as of April 2012. Besides this, the Broadcast Audience Research Council (BARC) data for rural viewership has prompted broadcasters to increase their offerings on this platform. Broadcasters such as Sony, Zee and Star launched their free dish-based channels with content like their pay channels on DTH. The only difference would be the delay window of the content. Hindi news channels are especially looking to broadcast on DD Free Dish, which will help them protect their advertisement revenue and save on carriage fees. This will shift advertisement revenue from pay to FTA channels

Distribution models

Billions of people watch TV content and advertising on a daily basis. Different distribution networks pass on the content from the creator to consumers. Consumers have the choice to receive a full set of TV channels from many service providers, be it telecom operators, cable providers, terrestrial or DTH operators. Those service providers aggregate all information required to offer a full media experience to consumers. One important step in the content distribution network is the primary distribution of TV channels from the content provider’s video headend and uplink (programmer video headend) to the headends of each of the service providers. In many cases, TV channels are distributed to hundreds or thousands of headends. Naturally, satellite is the preferred medium used for primary distribution. Dispersed over vast geographical areas, these headends retransmit the received TV channels to millions of consumers paying to watch the content. Any service loss in the primary distribution network instantly impacts millions of consumers, resulting in consumer churn and instant loss of advertisement revenues for service providers and content producers.

- Primary distribution uses a transmission channel for transferring audio and/or video information to one or several destination points without a view to further post-processing on reception (e.g., from a continuity studio to a transmitter network);
- Secondary distribution uses a transmission channel for distribution of programmes to viewers at large through over-the-air broadcasting or cable television, including retransmission by broadcast repeaters, satellite master antenna television (SMATV) and community based-networks, e.g., community antenna television (CATV).



For secondary distribution, the three main types of terrestrial networks are listed below.

- Cable: a term used to describe video delivery via a coaxial cable connection
- IP: a term used to describe video delivery over the internet via a privately managed network
- Digital terrestrial: video delivery via radio waves received via a digital set-top box, TV gateway or an integrated tuner included with a television set

Terrestrial networks receive channels at the network headend and redistribute the television signal to subscribers. The channels are often sent to the network headend via satellite. Digital video broadcasting (DVB) solutions are used for terrestrial broadcasting in most parts of the world. The main exceptions are North and South America, where ATSC and ISDB-T, respectively, are dominant.

The traditional primary distribution model relies heavily on satellite. Distribution partners receive broadcast feeds via satellite at hundreds of regional headends. The main challenge with this framework is that it requires setting up links at multiple locations. That can be a lengthy and expensive process.

The cloud has emerged as a great choice for primary distribution. With primary distribution in the cloud, you can quickly establish links to new affiliates.

Satellite audience continues to grow. Broadcasters continue to choose satellite distribution for its extensive reach and scaling capabilities. Unlike other forms of distribution, satellites offer a multitude of channels and reach more audience members in a more cost-effective way than OTT.

Key regulatory policies governing television industry

Government policies and regulations on the Indian TV industry, mainly dictated by TRAI and the MIB, have far reaching and often varied impact on the diverse set of players they govern. CRISIL Research recapitulates some of

the important policy directives in recent times that have impacted various players in the industry - down to the viewers - for good or for bad:

Impact of new tariff order on the TV industry

On March 3, 2018, TRAI issued the new tariff order (NTO) and interconnection order to:

1. regulate the maximum retail price (MRP), excluding taxes, payable by a subscriber for à-la-carte pay channels or a bouquet of pay channels
2. provide a framework on commercial and technical arrangements among service providers, i.e., distribution platforms (LCO, DTH, MSO, HITS, or IPTV operators) and broadcasters for broadcasting services related to television provided through addressable systems

Although the deadline for implementation of the order was 180 days from notification, it was repeatedly delayed as players in the TV value chain were struggling to implement the changes. After multiple delays, the order was finally implemented on February 1, 2019.

MSOs were the most hit as they witnessed subscriber churn of over 5 million in the last quarter of fiscal 2019. Some subscribers chose to discontinue their subscription and wait for further clarity on the new regime, while a few others opted for DTH subscriptions.

The new tariff order is expected to be positive for DTH players as customer pay-outs that were traditionally more expensive for DTH than MSOs reached an inflection point under the new order. Additionally, as customers can now choose their channels, content cost has now become a pass-through item for DTH players under the new regime, potentially boosting operating margins of these players.

Ad revenue of broadcasters was affected as corporates withheld or slowed down their ad spending during the implementation of the new tariff order. The Broadcast Audience Research Council publishes weekly viewership data, a key metric for corporates to decide on their advertising strategy. When the council stopped publishing the data during the transition to new regime, non-availability of the data prompted corporates hold back their ad spends. We expect corporates to revive their ad spending from the first quarter of fiscal 2020.

Impact of GST on DTH and cable TV

DTH operators are expected to benefit under the GST regime as they earlier paid service tax of 14.5% for the services received from broadcasters, along with entertainment tax ranging from 2% to 35% (in different states). Their indirect tax outgo, on average, was 23-25%. Under GST, 18% tax is levied, with a bottom-line gain of 5-7% if the benefit is not passed on to consumers. Also, currently DTH players pay license fees of 10% of their adjusted gross revenues. As per TRAI recommendation, this is expected to be revised to 8% and further boost margins.

Most cost items for MSOs come under CENVAT under the current regime. The impact on these will remain almost neutral. But the service charge pre-GST was ~22% (service tax + entertainment tax) which will now fall to 18% under GST. Hence, MSO players will accrue benefits of ~300 bps.

Pre-GST, broadcasters were paying 15% tax, however, post-GST, the tax rate has been hiked to 18%. The increase in tax rate is likely to be passed on to consumers given their adequate pricing power. Thus, the net margin of broadcasters will not see any major impact on account of the new taxation regime.

Migration to digital addressable system completed in 2016-17

The last and final phase of digitisation in the country concluded by the end of March 2017 marked a phased change-over from analogue cable networks to a digital addressable cable TV system, announced by TRAI in 2010. The system enables consumers to watch high quality TV content of their choice and can deliver more channels.

FDI limits

In fiscal 2016, foreign direct investment (FDI) limits in TV for different applications and technologies were modified. The limits for different modes of distribution of TV signals and content broadcasting (news and non-news) are as shown in the table below.

FDI limits in different TV applications and segments

Sector	FDI limit (before fiscal 2016)	FDI limit (after alteration in fiscal 2016)	Existing limits
DTH, Cable networks, mobile TV, multi-service operators (MSOs), and head-end in the sky (HITS)	74% (upto 49%- direct route and beyond 49% FIPB approval)	100% (automatic route)	100% (automatic route)
Cable Networks (Other MSOs not undertaking upgradation of networks towards digitalization and addressability and LCOs)	49% (direct route)	49% (direct route)	100% (automatic route)
Up-linking of 'News & Current Affairs' TV channels	26% (direct route)	49% (FIPB route)	49% (Government route)
Up-linking of non- 'News & Current Affairs' TV channels	100% (direct route)	100% (direct route)	100% (automatic route)
Down-linking of TV channels	100% (direct route)	100% (direct route)	100% (automatic route)

Source: DIPP, CRISIL Research

Restrictions on cross holdings

Government regulations prevent broadcasting and cable network companies from owning more than 20% of a DTH network, and vice versa.

According to TRAI's recommendations on media ownership released in August 2014:

- The Herfindahl Hirschman Index (HHI) is to be used as a measure of concentration in a media segment in a particular market. For example, if both the TV and newspaper markets have a HHI value greater than 1800, then an entity contributing over 1000 to the HHI of TV cannot contribute over 1000 in the HHI of newspaper as well, and vice versa. If it does, it will have to dilute its control in one of the two segments
- Mergers and acquisitions in the media industry will be allowed only to the extent that the rule based on HHI index is not breached
- Entities and surrogates of political and religious bodies, urban local bodies and panchayats, central and state government ministries, departments, companies, undertakings, joint ventures, government-funded entities and affiliates will be barred entry into broadcasting and TV channel distribution
- A clear disclaimer in bold letters is to be complied with for advertorials and any other paid content

- The same recommendations apply to paid news. Additionally, both parties to the transaction will be held liable if it is tried to be passed off as news

Developments on 'ad cap' hearing

In March 2013, TRAI passed a regulation mandating broadcaster to restrict the duration of advertisements on their channels to a maximum of 12 minutes in any given clock-hour. It also stipulated that broadcasters report the duration of advertisements carried in their channels on a quarterly basis, in a prescribed proforma.

Broadcasters challenged TRAI's directive before the Telecom Disputes Settlement & Appellate Tribunal (TDSAT), which concluded that the regulation needs to be complied with. However, a fresh petition was filed before the Delhi High Court after the Supreme Court ruled that the dispute could not be settled by the tribunal.

While many general entertainment channels have started implementing the regulations, the News Broadcasters Association has approached TDSAT seeking postponement of the regulation's implementation for news channels as subscription revenue has been sporadic post-digitisation. The MIB is also examining whether ad caps for news channels could be postponed.

TDS on payments by TV channels

Television broadcasting companies make significant payments to production houses for TV programmes. The Central Board of Direct Taxes (CBDT) clarified that, while applying the relevant provision of tax deducted at source (TDS) on a contract for content production, a distinction needs to be made between (a) payment for production of content, as per the specifications of the broadcaster, and (b) payment for acquisition of broadcasting/telecasting rights of content already produced by the production house.

The first implies a "work contract" and is hence liable for TDS. However, the second does not imply a contract for "carrying out any work" and is therefore not liable for TDS.

The CBDT also clarified that no TDS is attracted on payments made by television channels/newspaper companies to an advertising agency for booking, procuring or canvassing for advertisements.

Taxation of transponder charges

Transponder charges paid by broadcasters to satellite companies for transmission of their TV signals has so far been treated as royalty for tax purposes. However, after the amendment in the definition of royalty under the Income Tax Act, such payments received by foreign satellite companies are not taxable as royalty.

5 Competitor analysis of players in the Indian TV broadcasting and broadband industry

In this section, CRISIL Research has compared key players in the Indian telecom industry. Data in this section is obtained from publicly available sources, including annual reports and investor presentations of listed players, regulatory filings, rating rationales, and/or company websites. The financials used in the competitive section are re-classified by CRISIL based on the annual report and financial fillings by the players. There are 6 listed companies in India in the telecom service provider market that engage in a business exactly similar to that of Asianet Satellite Communication (Asianet). However, we have listed a few companies with a presence in some of the segments of Asianet

For this assessment, we have considered key telecom players, namely BSNL, Airtel, Reliance Jio, Vodafone Idea, Den Networks Ltd., Hathway Cable and Datacom Ltd., Nxt Digital, and Siti Networks Ltd.

As on May 2022, there were 1,760 MSOs registered with the MIB.

Company	Year of incorporation	Business segments			Geographic presence
		Internet	Cable/DTH	Telecom/Telcom Infra	
Asianet Satellite Communications Ltd. (Asianet)	1992	✓	✓		Southern India
Bharat Sanchar Nigam Ltd. (BSNL)	2000	✓		✓	Pan-India
Bharti Airtel Ltd. (Airtel)	1995	✓	✓	✓	Pan-India, Africa, Bangladesh, Sri Lanka
Den Networks Ltd. (Den)	2007	✓	✓		Delhi NCR, Uttar Pradesh, Rajasthan, Maharashtra, Gujarat, Karnataka, MP, Haryana
Hathway Cable and Datacom Ltd. (Hathway)	1959	✓	✓		Pan-India
Nxtdigital Ltd. (Nxt Digital)	2001	✓	✓		Pan-India
Reliance Jio Infocomm Ltd. (Jio)	2007	✓		✓	Pan-India
Siti Networks Ltd. (SITI)	1994	✓	✓		Pan-India
Vodafone Idea Ltd. (VI)	1995	✓		✓	Pan-India

Source: Company annual reports/investor presentations, CRISIL Research

Subscriber base of major MSOs/HITS operators at the end of March 2022

Sr. No.	Major MSOs/HITS operators	Total active subscriber base	Share among the top 13 players (%)
1	GTPL Hathway Ltd	82,32,240	17.9%
2	Siti Networks Ltd	72,81,041	15.9%
3	Hathway Digital Ltd	54,55,919	11.9%
4	Den Networks Ltd	44,58,103	9.7%
5	Thamizhaga Cable TV Communication Pvt Ltd	38,56,930	8.4%
6	Kerala Communicators Cable Ltd	30,42,828	6.6%
7	Tamil Nadu Arasu Cable TV Corporation Ltd	26,41,641	5.8%
8	NXT Digital Ltd (HITS)	24,56,013	5.3%
9	KAL Cables Pvt. Ltd	20,58,720	4.5%
10	Fastway Transmissions Pvt Ltd	20,17,384	4.4%
11	V K Digital Network Pvt. Ltd	18,78,076	4.1%
12	NXT Digital Ltd (Cable TV)	13,94,481	3.0%
13	**Asianet Digital Network Pvt. Ltd**	**11,42,778**	**2.5%**
	Total subscriber base of major MSOs/HITS players (>1 million subscribers)	4,59,16,154	Represents ~50% of cable subscribers

Source: TRAI, CRISIL Research

- Asianet Communication's cable business, represented by Asianet Digital Network, is among the top 13 MSOs/ HITS operators in India as of March 2022
- Asianet was among the top three fixed broadband providers in Kerala market with market share of ~25% in fiscal 2022 with 0.38 Mn wired broadband subscribers in Kerala market. Kerala reported total fixed broadband subscribers of 1.5 Mn in fiscal 2022. BSNL had largest share in the fixed broadband market in Kerala. Asianet majorly offers wired fibre broadband services to all its subscribers. At pan-India level, fiber based wired broadband has share of 70% in total wired broadband subscribers, followed by Ethernet / LAN and DSL technologies with 14% and 11% share respectively as of March 2022. With this same assumption on penetration of technologies for Kerala market, Kerala market is estimated to have more than 1.0 Mn fibre broadband subscribers as of fiscal 2022
- Asianet registered a market share of 13-15% between fiscal 2015 and 2020 in fixed broadband Kerala market which increased to 22-25% in fiscal 2021 and 2022.
- Asianet grew faster at 23.4% CAGR between fiscal 2019 and 2022 in terms of numbers of subscribers as compared to CAGR of 3.8% for Kerala fixed broadband market
- Asianet reported growth in fixed broadband subscriber of 13.8% CAGR from fiscal 2016 to fiscal 2022, faster than India's average of 8.2% CAGR during the same period
- Asianet was ranked 16th among the 660 Internet Service Providers (ISPs) in India based on number of subscribers at pan-India level with 0.39 million total internet subscribers as of March 2022.

No of broadband subscribers (in millions)

Players	CY16	CY20	CY21	Till March 2022	CAGR CY16-21	CAGR CY19-21
Asianet	0.19	0.28	0.37	0.39	14.3%	30.6%
BSNL	20.36	26.32	25.54	27.19	4.6%	3.2%
Airtel	43.56	179.00	210.07	215.27	37.0%	22.3%
Den	0.12	0.11	0.11	0.08	-1.7%	-4.2%
Hathway	0.58	1.05	1.08	1.11	13.2%	9.6%
Jio	72.16	410.84	420.28	409.28	42.2%	6.5%
SITI	0.04	0.05	0.08	0.10	14.9%	102.8%
VI	62.06	120.77	122.62	122.48	14.6%	1.7%

Source: TRAI, CRISIL Research

Technology in wired broadband internet services

Players	Technology used for broadband
Asianet	Asianet Broadband uses GPON technology for broadband while less than 5% subscribers on DOCSIS
Airtel	Offering broadband with both DOCSIS 3.1 (coaxial copper cable) and GPON (fiber-optic) technology. According to the company's December 2020 investor call transcript, Airtel is in the process of rapidly replacing its legacy copper assets completely with fiber. Airtel also uses DSL and VDSL technology to provide wireline internet service.
Den	Its fixed broadband infrastructure is built using a mix of GPON/FTTX and Metro Ethernet technologies, enabling download speeds from 20 Mbps till 1 Gbps.
Hathway	Uses a combination of DOCSIS 3.0 and 3.1 & GPON tech-based broadband with speed up to 1 Gbps
Jio	Provides GPON (fibre optic) tech-based broadband pan-India
SITI	Broadband through hybrid (DOCSIS 2/3 & GPON) network
VI	Uses a combination of DOCSIS 3.0/3.1 and GPON tech

Source: Company documents, news article, CRISIL Research

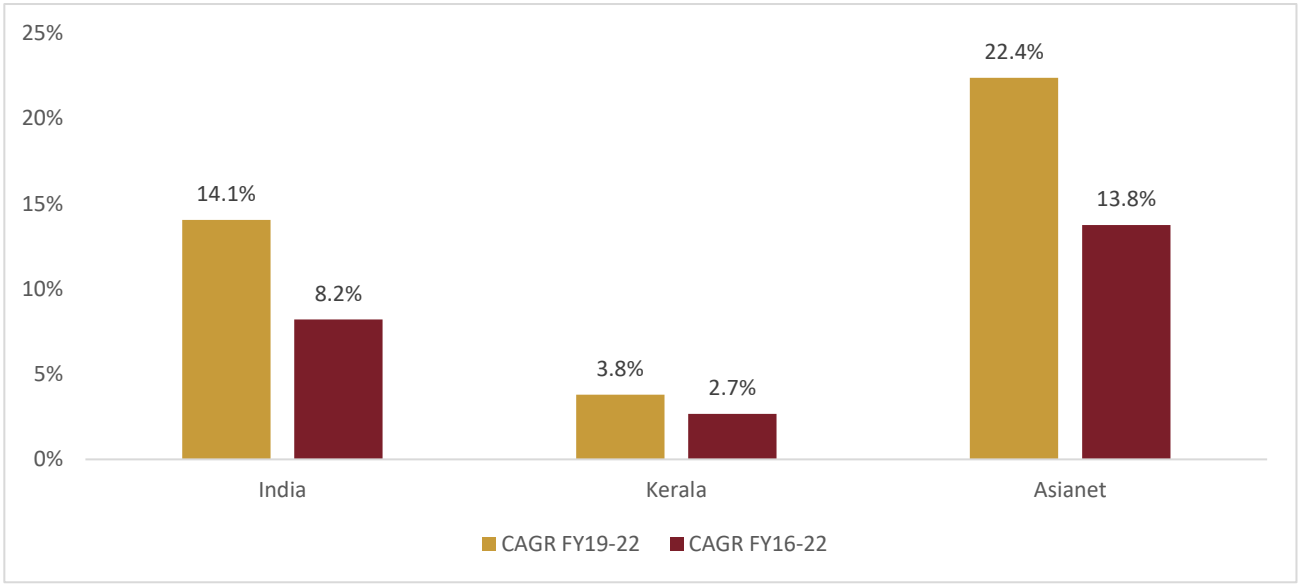
Fixed broadband subscribers

Subscribers in Mn	FY16	FY19	FY20	FY21	FY22	CAGR FY16-FY22	CAGR FY19-22
India	17.0	18.4	19.2	22.8	27.3	8.2%	14.1%
Kerala	1.28	1.34	1.37	1.25	1.50	2.7%	3.8%
Asianet – India*	**0.18**	**0.21**	**0.20**	**0.29**	**0.39**	**13.8%**	**22.4%**
Asianet - Kerala	**0.18**	**0.20**	**0.19**	**0.28**	**0.38**	**12.8%**	**23.4%**
Asianet share in Kerala market	**14%**	**15%**	**14%**	**22%**	**25%**		

Note::Indicates total broadband subscribers; Kerala numbers for fiscal 16, 19,20 and 21 are as of end of December for respective fiscals (example FY21 is as of December 2020)*

Source: Dept. of Telecommunication- Telecom Statistics India 2021, TRAI, CRISIL Research

Fixed broadband subscribers



Source: TRAI, CRISIL Research

Financial performance (FY19-22)

Company	Operating income		OPBDIT		PAT	
	FY19	FY22	FY19	FY22	FY19	FY22
	(Rs mn)	(Rs mn)	(Rs mn)	(Rs mn)	(Rs mn)	(Rs mn)
Asianet	4,140	5,775	1,025	1,678	93	398
BSNL^	1,81,312	1,74,521	-95,612	492	-1,49,043	-74,411
Airtel	8,10,714	11,68,560	2,46,841	5,78,430	16,875	83,052
Den	11,847	12,256	1,416	2,033	-3,045	1,711
Hathway	15,538	20,000	3,135	5,215	-1,906	1,304
Nxt Digital^	6,351	10,699	-667	1,784	-3,431	19
Jio#	4,08,760	5,44,930	1,52,930	2,18,590	29,820	55,990
SITI	14,421	14,459	3,251	1,861	-2,643	-2,610
VI	3,70,313	3,85,155	40,539	1,60,361	-1,46,122	-2,82,454

^ - Financial data is for fiscal 2021 as latest financials for fiscal 2022 is not publicly available

#- Financial data is for fiscal 2020 as latest financials for fiscal 2021 and fiscal 2022 at consolidated basis is not publicly available

Source: Company documents, CRISIL Research

Growth trend in financial parameters

Players	Operating income CAGR FY19-22	OPBDIT CAGR FY19-22	PAT CAGR FY19-22
Asianet	11.7%	17.9%	62.4%
BSNL^	-1.9%	n.m.	n.m.
Airtel	13.0%	32.8%	70.1%
Den	1.1%	12.8%	n.m.
Hathway	8.8%	18.5%	-188.1%
Nxt Digital^	29.8%	n.m.	n.m.
Jio#	33.3%	42.9%	87.8%
SITI	0.1%	-17.0%	-0.4%
VI	1.3%	58.2%	24.6%

^ - Financial data is for fiscal 2021 as latest financials for fiscal 2022 is not publicly available

#- Financial data is for fiscal 2020 as latest financials for fiscal 2021 and fiscal 2022 at consolidated basis is not publicly available

Key financial ratios of players – FY22

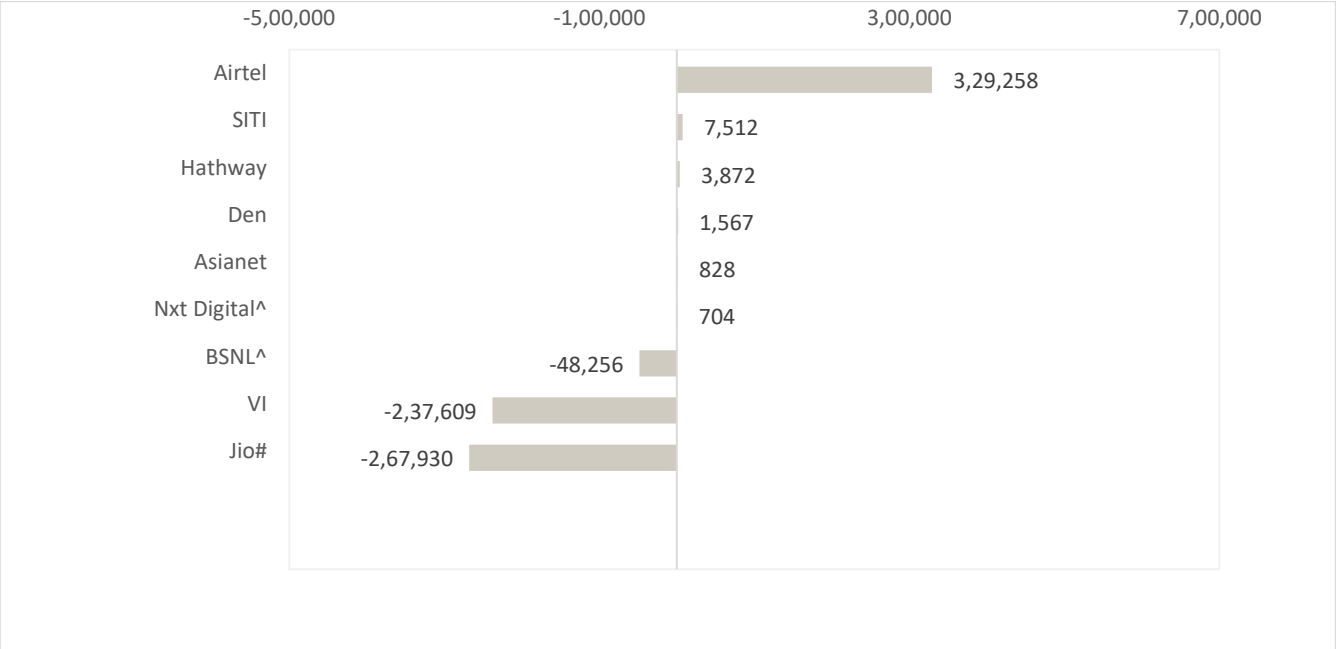
Company	Operating margin (%)	ROCE (%)	Interest coverage (times)	Gearing (times)	Current ratio	CFO
Asianet	29.1	17.9	8.6	1.0	0.4	828.0
BSNL^	0.3	-5.9	0.2	0.9	0.7	-48,255.8
Airtel	49.5	35.1	3.6	-4.3	0.4	3,29,258.0
Den	16.6	6.4	1,159.7	0.0	2.0	1,566.7
Hathway	26.1	4.6	0.0	0.0	0.9	3,872.4
Nxt Digital^	16.7	5.6	1.6	10.8	0.2	703.9
Jio#	40.1	15.8	3.2	0.2	0.7	-2,67,930.0
SITI	12.9	-28.5	1.7	-1.3	-0.2	7,511.6
VI	41.6	0.0	0.8	-0.3	0.3	-2,37,609.0

^ - Financial data is for fiscal 2021 as latest financials for fiscal 2022 is not publicly available

#- Financial data is for fiscal 2020 as latest financials for fiscal 2021 and fiscal 2022 at consolidated basis is not publicly available

Source: Company documents, CRISIL Research

Asianet had positive cash flow from operations in fiscal 2022



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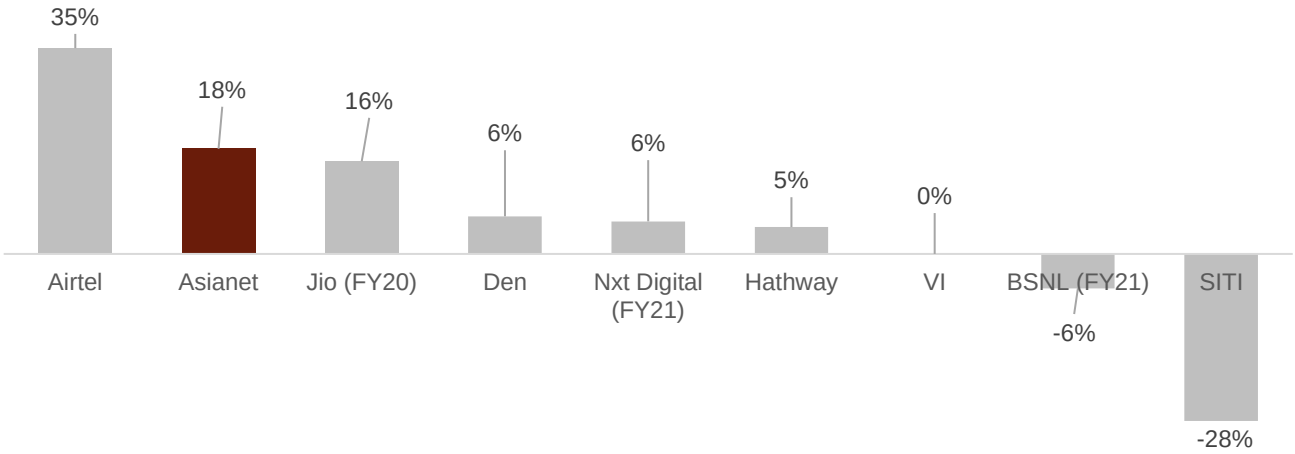
Source: Company documents, CRISIL Research

In terms of ROCE, Asianet has achieved one of the highest ROCE among the peer set with 18% in fiscal 2022



Source: Company documents, CRISIL Research

6 Annexures

Internet subscriber base and market share of top 10 service providers (March 2022)

Rank	ISP	No. of subscribers (million)	Share (%)
1	Reliance Jio Infocomm Ltd	409.3	49.6%
2	Bharti Airtel Ltd.	235.7	28.6%
3	Vodafone Idea Ltd	135.7	16.5%
4	Bharat Sanchar Nigam Ltd.	30.1	3.6%
5	Atria Convergence Technologies Pvt. Ltd.	2.1	0.3%
6	Hathway Cable And Datacom Limited	1.1	0.1%
7	ONEOTT iNTERTAINMENT LIMITED	1.0	0.1%
8	YOU Broadband India Ltd.	0.8	0.1%
9	GTPL Broadband Pvt. Ltd.	0.7	0.1%
10	Excitel Broadband Pvt. Ltd.	0.7	0.1%
16	Asianet Satellite Communications Ltd	0.4	0.05%
	Total of top 10 ISPs	**817.2**	**99.1%**
	Others	**7.7**	**0.9%**
	Grand total	**824.9**	**100%**

Source: TRAI, CRISIL Research

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