सत्यमेव जयते

# ECONOMIC SURVEY

## 2020-21

## VOLUME-1


# Economic Survey 2020-21

## Volume 1

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# Preface

**ॐ असतो मा सद्गमय । तमसो मा ज्योतिर्गमय ।**
**O Lord, Keep me not in Unreality, but make me go towards the Reality,**
**Keep me not in Darkness, but make me go towards the Light.**

Economic Survey 2020-21 is an ardent tribute to the immortal human spirit of grit and compassion encapsulated by the tireless battle against the pandemic by our frontline COVID-19 warriors. In the midst of the most unfathomable global health emergency experienced in modern history, the resolve of each Indian helped find its way from the darkness of 'lives vs livelihoods' to the glow of '#SavingLives&Livelihoods'. The foresight of our collective vision to battle this pandemic became evident when policy insights and implementation at the Centre, State and local level converged to initiate a V-shaped economic recovery. This spirit resonated in the recent Team India's victory in Australia where their resilience to rebound from 36 all out to winning the Test series was a V-shaped performance indeed! Similarly, after experiencing a sharp contraction of 23.9% in first quarter of 2020-21, India is expected to be the fastest growing economy in the next two years. Projections by various national and international agencies including the IMF project this resilience of the Indian economy.

Through this year, as India bravely fought the global pandemic, it charted its own unique trajectory – showing remarkable resilience, be it fighting the virus or ensuring economic recovery. This resilience is driven by the strength of our systems that enforced the graded public health measures, ramped up the health response, ensured free food grains to 80 crore people and gave momentum to the economic recovery. India derived its strength from the support of 137 crore Indians who practised social distancing, wore masks and industriously contributed to the fight.

Team@Eco Survey, 2020-21 recognises the integral role of effective policymaking in charting the path to economic growth and social development. The upturn in the economy while avoiding a second wave of infections makes India a sui generis case in strategic policymaking, of being fearless to choose the road less travelled by; for in the end, that makes all the difference. India's human-centric policy response to the pandemic, tailored to India's unique vulnerabilities, demonstrated the power of upholding self-belief under immense uncertainty. India transformed the short-term trade-off between lives and livelihoods into a win-win in the medium to long-term that saves both lives and livelihoods. Empowered by vision and foresight, India turned this crisis into an opportunity by ramping up its health and testing infrastructure and implementing a slew of seminal reforms to strengthen the long-term growth potential of the economy.

Clarity of objectives is imperative in policymaking as the various macro-economic policy choices always present inherent trade-offs. The Survey makes the case for continued focus on economic growth as the most important objective for India at its stage of development. Survey, then, delineates the constituents that would strengthen effectiveness of policymaking – continued reforms, innovation, timely regulatory support and withdrawal of forbearance. Continuing the endeavours of previous Surveys to relate economics to a common person, this year the Survey constructs an index of 'the bare necessities' across States in India.

Digital Technology has been the 'sprint runner' of this year that enabled us to tide over the disruptive effects of the pandemic. As a recognition of its role, the Survey this year has gone digital. To enhance the e-readability, for the first time, the aligning of the text in the Survey is in a single column. We chose to continue with the popular tradition of presenting the Survey in two volumes. Volume I, attempts to provide evidence based economic analyses of the challenges of policymaking and tools to make it more effective. Volume II reviews recent developments in the major sectors of the economy with a focus on the challenges faced due to the pandemic this year. This would serve as the ready reckoner for the existing status and outlook for the sectors.

The Economic Survey attributes its existence and popularity to the collaborative effort of all Ministries and Departments of Government of India, the prodigious resource base of the Indian Economic Service officers, valuable inputs of researchers, consultants and think tanks both within and outside the government and the consistent support of all officials of the Economic Division, Department of Economic Affairs. The Survey has made a sincere effort to live up to the expectation of being an indispensable guide on performance, challenges and prospects of the Indian economy.

As our former President Dr A.P.J.Abdul Kalam said *"When we tackle obstacles, we find hidden reserves of courage and resilience we did not know we had…..We only need to find them and move on with our lives"*. This year is a testimony to the resilience and intrinsic strength of the fundamentals of the Indian society and the economy. We present this year's Survey with a deep sense of confidence that Indians have demonstrated to come out victorious against any adversity. The Survey salutes this self-belief of 137 crore Indians.

**Krishnamurthy V. Subramanian**
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Government of India

## ABBREVIATIONS

| | |
|---|---|
| AB PMJAY | Ayushman Bharat Pradhan Mantri Jan Arogya Yojana |
| ACSQHC | Australian Commission on Safety and Quality in Health Care |
| AE | Advanced Economies |
| AGM | Annual General Meeting |
| AIDIS | All India Debt and Investment Survey |
| ALM | Asset-liability management |
| ALP | Advanced Leadership Program |
| AM | Ayushman Mitra |
| ANB | Atma Nirbhar Bharat |
| ANZSOG | Australia and New Zealand School of Government |
| APAR | Annual Performance Appraisal Report |
| APMC | Agricultural Produce Market Committee |
| APS | Australian Public Service |
| AQR | Asset Quality Review |
| ARC | Administrative Reforms Commission |
| ASEAN | Association of Southeast Asian Nations |
| AUS | Australia |
| AUT | Austria |
| BDO | Block Development Officer |
| BEL | Belgium |
| BIS | Beneficiary Identification System |
| BNI | Bare Necessities Index |
| BPL | Below Poverty Line |
| BPO | Business Process Outsourcing |
| BRICS | Brazil, Russia, India, China, and South Africa |
| BSE | BSE Limited |
| CAGR | Compound Annual Growth Rate |
| CAN | Canada |
| CAR | Capital Adequacy Ratio |
| CCS | Covenanted Civil Service |
| CCS | Central Civil Service |
| CEO | Chief Executive Officer |
| CFR | Case Fatality Rate |
| CHE | Switzerland |
| CMS | Centres for Medicare & Medicaid Services |
| COVID-19 | Coronavirus Disease |
| CPI | Consumer Price Inflation |
| CPRS | Central Policy Review Staff (UK) |
| CRA | Credit Rating Agency |
| CSC | Civil Service Commission |
| CSC | Common Service Centres |
| CSR | Corporate Social Responsibility |
| CVC | Central Vigilance Commission |
| CXP | Current External Payments |
| CXR | Current Account External Receipts |
| DA | Dearness Allowance |
| DARPG | Department of Administrative Reforms and Public Grievances |

| | |
|---|---|
| DEU | Germany |
| DHHS | Department of Health and Human Services |
| DiD | Difference-in-Difference |
| DISCOM | Distribution Company |
| DM | Deputy Minister |
| DNK | Denmark |
| DOPT | Department of Personnel and Training |
| DOTS | Directly Observed Therapy, Short course |
| EME | Emerging Market Economies |
| EoDB | Ease of Doing Business |
| ESP | Spain |
| ETC | Electronic Toll Collection |
| FC | Foreign Currency |
| FDI | Foreign Direct Investment |
| FE | Fixed Effects |
| FIN | Finland |
| FMI | Financial Management Initiative |
| FPI | Foreign Portfolio Investment |
| FRA | France |
| FSB | Financial Stability Board |
| FTE | Full Time Equivalent |
| G-20 | Group 20 |
| GAO | General Accountability Office |
| GBR | United Kingdom |
| GCF | Gross Capital Formation |
| GDP | Gross Domestic Product |
| GEI | Government Effectiveness Index |
| GeM | Government e Marketplace |
| GERD | Gross Domestic Expenditure on Research & Development |
| GFC | Global Financial Crisis |
| GII | Global Innovation Index |
| GNPA | Gross Non-Performing Assets |
| GRC | Greece |
| GSDP | Gross State Domestic Product |
| G-Sec | Government Securities |
| GVA | Gross Value Added |
| HCR | Human Capital & Research |
| HDE | Human Development Expenditure |
| HoD | Head of Department |
| HR | Human Resources |
| HRM | Human Resource Management |
| IAS | Indian Administrative Service |
| IBBI | Insolvency and Bankruptcy Board of India |
| IBC | Insolvency and Bankruptcy Code |
| ICS | Indian Civil Service |
| ICT | Information & Communication Technology |
| iGOT | Integrated Government Online Training |
| IIP | Index of Industrial Production |
| IMF | International Monetary Fund |

| | |
|---|---|
| IMR | Infant Mortality Rate |
| INR | Indian Rupee |
| IPCR | Individual Performance, Commitment and Review |
| IPO | Initial Public Offering |
| IRDA | Insurance Regulatory and Development Authority |
| IRGD | Interest rate- growth differential |
| IRL | Ireland |
| ISR | Israel |
| IT | Information Technology |
| ITA | Italy |
| ITAT | Income Tax Appellate Tribunals |
| JPN | Japan |
| JV | Joint Venture |
| KTO | Knowledge & Technology Outputs |
| L1 | Least Cost Criteria |
| LMIC | Low and Lower Middle Income |
| MCA | Ministry of Corporate Affairs |
| MDG | Millennium Development Goal |
| MGNREGS | Mahatma Gandhi National Rural Employment Guarantee Scheme |
| MINIS | Management Information System for Ministers |
| MLP | Medium to Long Term Plan |
| MMR | Maternal Mortality Rate |
| MNC | Multinational Corporation |
| MoHFW | Ministry of Health and Family Welfare |
| MoM | Month on Month |
| MoSPI | Ministry of Statistics and Program Implementation |
| MPM | Ministry of Personnel Management |
| MSBY | Mukhyamantri Swasthya Bima Yojana |
| MSME | Micro, Small and Medium Enterprises |
| NABH | National Accreditation Board for Hospitals & Healthcare Providers |
| NBER | National Bureau of Economic Research |
| NCD | Non Communicable Disease |
| NCD | Non Convertible Debentures |
| NCLAT | National Company Law Appellate Tribunal |
| NCLT | National Company Law Tribunal |
| NFHS | National Family Health Survey |
| NHA | National Health Authority |
| NHCP | National Health Care Providers |
| NHM | National Health Mission |
| NHS | National Health Service |
| NII | High Net-Worth Individual Investor |
| NIP | National Investment Pipeline |
| NIPFP | National Institute of Public Finance and Policy |
| NLD | Netherlands |
| NMR | Neonatal mortality rate |
| NOR | Norway |
| NPAs | Non-Performing Assets |
| NPI | Non Pharmaceutical Interventions |
| NPM | New Public Management |

| | |
|---|---|
| NSDL | National Securities Depository Limited |
| NSDP | Net State Domestic Product |
| NSE | National Stock Exchange of India Limited |
| NSO | National Statistical Office |
| NSQHS | National Safety and Quality Health Service |
| NSS | National Sample Survey |
| NSSO | National Sample Survey Office |
| NZL | New Zealand |
| ODF | Open Defecation Free |
| OECD | Organisation for Economic Co-operation and Development |
| OLS | Ordinary Least Square |
| OOP | Out of Pocket |
| OOPE | Out of Pocket Expenses |
| OPD | Outpatient Department |
| OPM | Office of Personnel Management |
| OSP | Other Service Providers |
| OxCGRT | Oxford COVID |
| PF | Provident Fund |
| PHACO | Phacoemulsification |
| PLI | Production Linked Incentive |
| PMAY | Pradhan Mantri Awas Yojana |
| PMGKY | Pradhan Mantri Garib Kalyan Yojana |
| PMJAY | Pradhan Mantri Jan Arogya Yojana |
| PMJDY | Pradhan Mantri Jan Dhan Yojana |
| PMO | Prime Minister's Office |
| PPE | Personal Protective Equipment |
| PPP | Purchasing Power Parity |
| PRP/P4P | Performance Related Pay/Pay for Performance |
| PRT | Portugal |
| PSB | Public Sector Bank |
| PSC | Public Service Commission |
| QIB | Qualified Institutional Buyer |
| QOF | Quality & Outcome Framework |
| R&D | Research and Development |
| RBI | Reserve Bank of India |
| REP | Ricardian Equivalence Proposition |
| RFD | Results Framework Document |
| RHS | Right Hand Side |
| RII | Retail Individual Investor |
| RPTs | Related party transactions |
| RQ | Regulatory Quality |
| RSBY | Rashtriya Swasthya Bima Yojana |
| S&P | Standard & Poor |
| S&T | Science & Technology |
| SAG | Senior Administrative Grade |
| SBM | Swachh Bharat Mission |
| SCS | Senior Civil Servant |
| SDG | Sustainable Development Goals |
| SEA | South-East Asia(n) |

| | |
|---|---|
| SECC | Socio Economic Caste Census |
| SEQI | School education Quality Index |
| SES | Senior Executive Service |
| SGP | Singapore |
| SHI | Statutory Health Insurance |
| SICS | Small incision cataract surgery |
| SLWM | Solid & Liquid Waste Management |
| SPARROW | Smart Performance Appraisal Report Recording Online Window |
| SPMS | Strategic Performance Management System |
| SRM | Sovereign Analytical Pillars |
| SSC | Staff Selection Commission |
| SWE | Sweden |
| TB | Tuberculosis |
| U5MR | Under-Five Mortality Rate |
| UK | United Kingdom |
| UN | United Nations |
| UNICEF | United Nations Children's Fund |
| UPSC | Union Public Service Commission |
| US | United States of America |
| USA | United States |
| UT | Union Territory |
| WGI | Worldwide Governance Indicators |
| WHO | World Health Organization |
| WIPO | World Intellectual Property Organisation |
| YoY | Year on Year |

# Saving Lives and Livelihoods Amidst a Once-in-a-Century Crisis

01
CHAPTER

**आपदि प्राणरक्षा हि धर्मस्य प्रथमाङ्कुरः ।**

**Saving a life that is in jeopardy is the origin of dharma**
**– Mahabharata (Shanti parva), Chapter 13, Shloka 598**

*The COVID-19 pandemic engendered a once-in-a-century global crisis in 2020 – a unique recession where 90 per cent of countries are expected to experience a contraction in GDP per capita. Faced with unprecedented uncertainty at the onset of the pandemic, India focused on saving lives and livelihoods by its willingness to take short-term pain for long-term gain. India's response stemmed from the humane principle advocated eloquently in the Mahabharata that "Saving a life that is in jeopardy is the origin of dharma." Therefore, India recognised that while GDP growth will recover from the temporary shock caused by the pandemic, human lives that are lost cannot be brought back. The response drew on epidemiological and economic research, especially those pertaining to the Spanish Flu, which highlighted that an early, intense lockdown provided a win-win strategy to save lives, and preserve livelihoods via economic recovery in the medium to long-term. The strategy was also motivated by the Nobel-Prize winning research in Hansen & Sargent (2001) that recommends a policy focused on minimising losses in a worst case scenario when uncertainty is very high. Faced with an unprecedented pandemic and the resultant uncertainty, loss of scores of human lives captured thus the worst-case scenario.*

*This strategy was also tailored to India's unique vulnerabilities to the pandemic. First, as the pace of spread of a pandemic depends upon network effects, a huge population inherently enables a higher pace of spread. Second, as the pandemic spreads via human contact, high population density, especially at the bottom of the pyramid, innately aids the spread of the pandemic at its onset. Third, although the average age is low, India's vulnerable elderly population, in absolute numbers, exceeds significantly that of other countries. Finally, an overburdened health infrastructure exposed the country to a humongous supply-demand mismatch that could have severely exacerbated fatalities. In fact, assessments of crores of cases and several thousands of deaths by several international institutes in March and April possibly reflected the concerns stemming from such vulnerabilities.*

*To implement its strategy, India imposed the most stringent lockdown at the very onset of the pandemic. This enabled flattening of the pandemic curve and, thereby, provided the necessary time to ramp up the health and testing infrastructure. Faced with enormous*

*uncertainty, India adopted a strategy of Bayesian updating to continually calibrate its response while gradually unlocking and easing economic activity.*

*Using a plethora of evidence, the Survey demonstrates the benefits of this strategy in this chapter. India has transformed the short-term trade-off between lives and livelihoods into a win-win in the medium to long-term that saves both lives and livelihoods. By estimating the natural number of cases and deaths expected across countries based on their population, population density, demographics, tests conducted, and the health infrastructure, we compare these estimates with actual numbers to show that India restricted the COVID-19 spread by 37 lakh cases and saved more than 1 lakh lives. Uttar Pradesh, Gujarat and Bihar have restricted the case spread the best; Kerala, Telangana and Andhra Pradesh have saved the most lives; Maharashtra has under-performed the most in restricting the spread of cases and in saving lives. The analysis clearly shows that early and more stringent lockdowns have been effective in controlling the spread of the pandemic – both across countries and across States in India.*

*By constructing a stringency index at the State level Survey show that the under-or-over performance in cases and deaths (compared to the expected) correlates strongly with the stringency of the lockdown. Similarly, the V- shaped economic recovery also strongly correlates with the stringency of the lockdown. This alleviates concerns that the inference about the impact of the lockdown is due to any cofounding factors peculiar to India such as higher level of immunity, BCG vaccination, etc. As such India-specific factors are common to all states, they cannot be accounting for this correlation. Thus, Survey infer that the lockdown had a* ***causal*** *impact on saving lives and the economic recovery. India thus benefited from successfully pushing the peak of the pandemic curve to September, 2020 through the lockdown. After this peak, India has been unique in experiencing declining daily cases despite increasing mobility.*

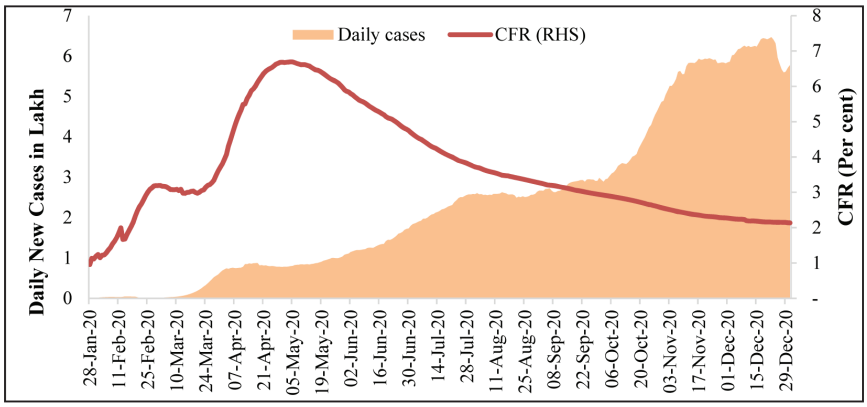
*While there was a 23.9 per cent contraction in GDP in Q1, the recovery has been a V-shaped one as seen in the 7.5 per cent decline in Q2 and the recovery across all key economic indicators. In line with learning from economic research, economic activity in States with higher intial stringency has rebounded faster during the year. On the economic policy front, India recognized that, unlike previous crises, the Covid pandemic affects both demand and supply. Furthermore, given disruptions in the labour markets that can affect disposable income and firms suffering financial distress, the loss of productive capacity due to hysteresis could not be ruled out. Therefore, a slew of structural reforms were announced; together, these would help to expand supply significantly in the medium to long term. On the demand side, at the onset of the pandemic, India's policies focused purely on necessities. This was optimal given the uncertainty and the resultant precautionary motives to save as well as the economic restrictions during the lockdown. After all, pushing down on the accelerator while the brakes are clamped only wastes fuel. During the unlock phase, demand-side measures have been announced in a calibrated manner. A public investment programme centred around the National Infrastructure Pipeline is likely to accelerate this demand push and further the recovery. The upturn in the economy while avoiding a second wave of infections makes India a sui generis case in strategic policymaking amidst a once-in-a-century pandemic.*

## COVID-19: ONCE IN A CENTURY 'CRISIS'

1.1 The world has endured a year of the unexpected onslaught by the novel COVID-19 virus - SARS-CoV-2 - first identified in Wuhan city of China in December 2019. The virus has posed an unprecedented challenge for policy making, globally and nationally. It has tested the mettle of policymakers to deal with uncertain, fluid, complex and dynamic situations having far-reaching socio-economic implications. It has also tested the frontiers of medical science, which rose to the challenge by developing an effective vaccine within a year.

1.2 The pattern and trends in spread of the virus across major countries showed that confirmed cases spread exponentially once community transmission began. Understanding the disease dynamics posed challenges as a large fraction of affected people were asymptomatic but were potentially contributing to the spread of the pandemic. By the end of February 2020, the infection had spread to over 54 countries, infected more than 85,403 individuals across the world and resulted in around 3,000 deaths. The exponential rise in the number of cases being witnessed daily compelled the World Health Organization (WHO) to title this outbreak a pandemic on March 11, 2020 – within a period of three months of its emergence. Within a year, it has infected around 9.6 crore people growing at an average rate of 3.3 per cent per day. The number of daily cases is still rising with more than 6 lakh cases per day. The pandemic has accounted for 20.5 lakh death across 220 countries with a global case fatality rate of 2.2 per cent as of 15th January 2020. However, in the initial stages of the pandemic, the world average case fatality rate (CFR) was much higher at 5-6 per cent (Figure 1). These features have made the virus lethal.

**Figure 1: Global Trend in COVID-19 Spread and Case Fatality Rates**




Source: Data accessed from World Health Organisation (WHO)– as on 31st December, 2020

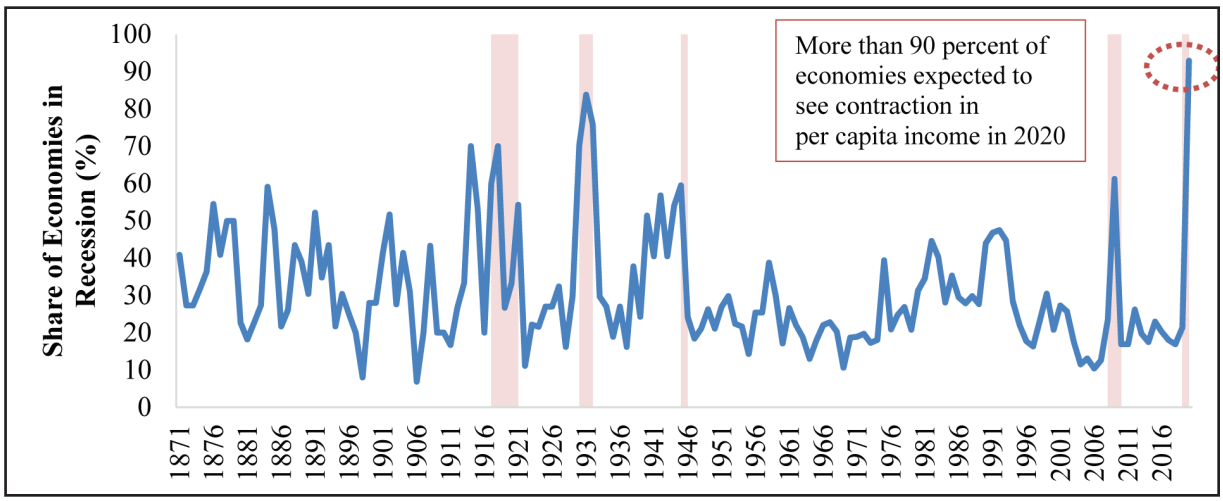
1.3 The only strategy that seemed viable for containment of the pandemic was active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread by practicing social distancing and safety precautions. Various non-pharmaceutical interventions (NPIs) – such as lockdowns, closure of schools and non-essential business, travel restrictions – were, therefore, adopted by countries across the globe. These were aimed to slow down the transmission of infection or 'flatten the epidemic curve' and buy the health care system some time to handle the surge in demand for its services and for development of an effective treatment and a vaccine (Box 1).

1.4 The global health crisis prompted by COVID-19, in addition to an enormous human toll, has engendered the largest economic shock the world economy has witnessed in the last century. The pandemic and associated lockdown measures led to a de facto shutdown of a significant

portion of the global economy, thereby triggering a global recession this year. The world economy is estimated to contract in 2020 by 4.3 per cent, as per World Bank, and 3.5 per cent, as per IMF. The crisis World is facing today is unique in a number of ways. Firstly, the health crisis-induced global recession is in contrast with previous global recessions which were driven by confluences of a wide range of factors, including financial crises (the Great Depression in 1930-32; 1982; 1991; 2009), sharp movements in oil prices (1975; 1982), and wars (1914; 1917-21; 1945-46).

1.5 Secondly, this recession is highly synchronized as the fraction of economies experiencing annual declines in national per capita is highest since 1870—more than 90 per cent, even higher than the proportion of about 85 per cent of countries in recession at the height of the Great Depression of 1930-32 (Figure 2). The pandemic is, therefore, once in a 150-year event with an unprecedented impact with all regions in the world projected to experience negative growth in 2020. It is aptly called the 'Great Lockdown'.

**Figure 2: Once-in-a-Century 'Synchronized' Recession**




Source: World Bank
Note: Recession is defined here as contraction in per capita income

1.6 Thirdly, the present crisis is unique as it originated in a pandemic that required social distancing and limiting of physical interactions. Thus, inherent to the crisis there was the trade-off – at least in the short run – between health and human lives, on the one hand, and the economy and livelihoods, on the other hand. Specifically, containment measures, necessary to manage the pandemic and save lives, limited human interactions and thereby restricted economic activities of various hues and exacerbated the impact on livelihoods. Thus, the COVID crisis presented a trade-off between lives and livelihoods, in the short run.

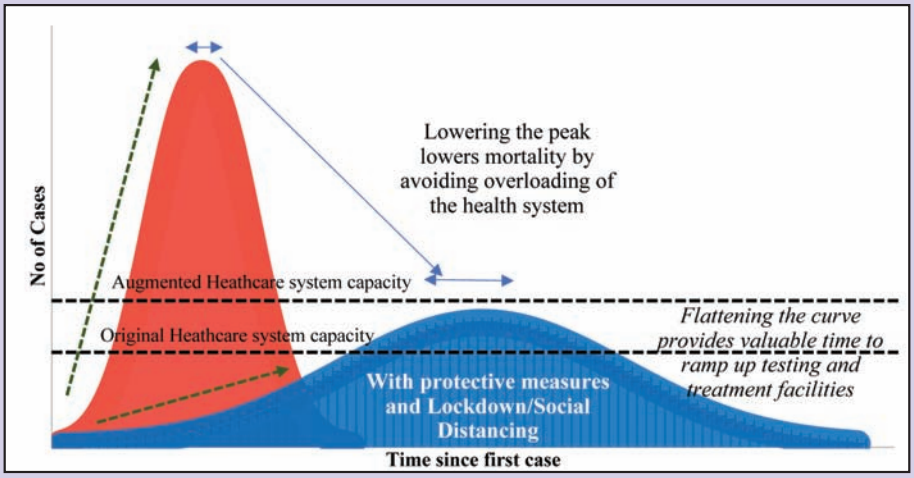
1.7 The short-run trade-off presented countries with policy options that revealed policymakers' preferences for the "value" placed on human life versus the "price" of temporary economic restrictions. Unlike Oscar Wilde's cynic, "who knows the price of everything and the value of nothing," India's policy response to the pandemic stemmed fundamentally from the humane principle advocated eloquently in the Mahabharata that "Saving a life that is in jeopardy is the origin of dharma." Therefore, the "price" paid for temporary economic restrictions in the form of temporary GDP decline is dwarfed by the "value" placed on human life. As the Survey demonstrates clearly, using a plethora

of evidence, India's policy response valuing human life, even while paying the price of temporary GDP decline, has initiated the process of transformation where the short-term trade-off between lives and livelihoods is converted into a win-win in the medium to long-term that saves both lives and livelihoods.

## Box 1: Flattening the Curve

Epidemiological research highlights that a key strategy to combat the spread of an epidemic is termed as "flattening the curve." The curve refers to the projected number of people who will contract the disease in a given population. The shape of the curve varies according to the rapidity with which the infection spreads in the community. There is a "peak" of the disease, where the number of infected individuals reaches a maximum, followed by a decline. Policymakers care particularly about the time taken to reach this peak because this determines the time available to respond to early signs of a pandemic. The peak number of infected individuals is also important as it determines the scale of medical facilities required. Overloaded healthcare systems that are forced to operate beyond their capacity lead to higher case fatality rates. In the short run, the capacity of any country's health system is finite (number of hospital beds, number of skilled health professionals, ventilators/Integrated Care Units among others). This puts an upper bound on the number of patients that can be properly treated, at any given point of time. If the spread of the pandemic exceeds the existing capacity of the health system, it may lead to higher mortality rates. The 'flattening of the curve' spreads the pandemic over time, enabling more people to receive proper health treatment – ultimately lowering the fatality rate.

**Flattening the Curve**




The transmission potential is often summarized by the expected number of new infections caused by a typical infected individual during the early phase of the outbreak, and is usually denoted by the basic reproduction number, $R_0$. It is simply the expected number of new cases of the disease caused by a single individual. Three possibilities exist for the potential transmission or decline of a disease, depending on its $R_0$ value: (i) If $R_0 < 1$, each existing infection causes less than one new infection and the disease eventually peters out; (ii) If $R_0 = 1$, each existing infection causes one new infection and will not lead to an outbreak or an epidemic and (iii) If $R_0 > 1$, each existing infection causes more than one new infection and there may be an outbreak or epidemic. Occasionally, one person may transmit to tens or even hundreds of other cases - this phenomenon is called super-spreading.

If individuals and communities take appropriate steps to reduce $R_0$ and slow the spread of the virus, the cases would be stretched out across a longer period of time, thereby flattening the curve and avoiding overburden of the existing healthcare systems. It also buys time to potentially develop newer drugs and vaccines targeted at the virus.

## RESEARCH-DRIVEN POLICY RESPONSE AMIDST UNPRECEDENTED UNCERTAINTY

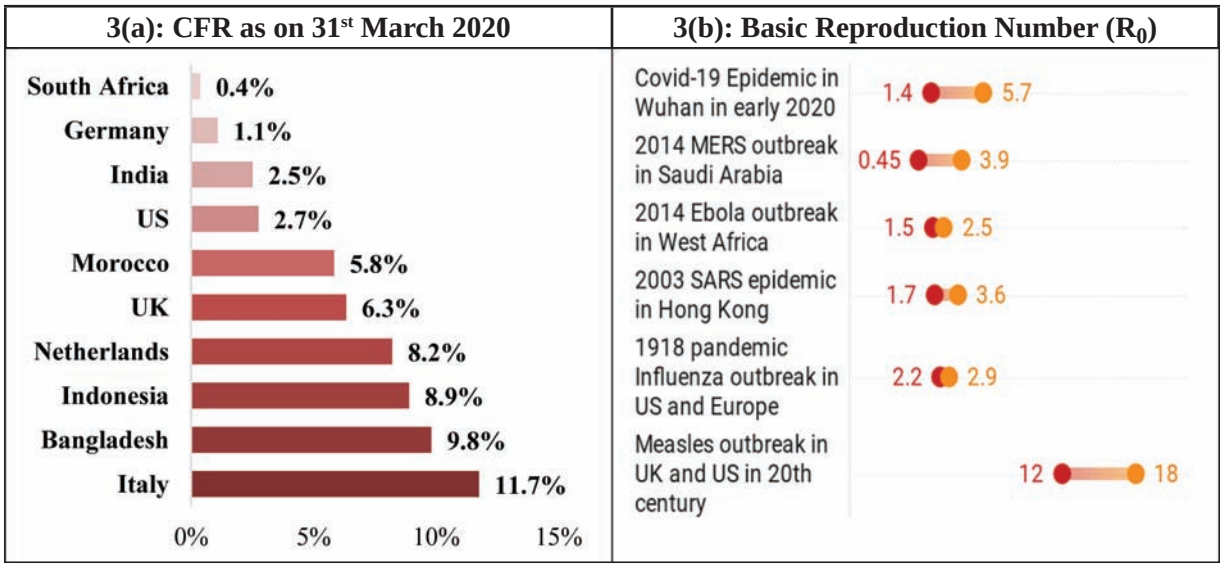
1.8 Two fundamental strategies to combat an epidemic are possible: (a) mitigation, which focuses on slowing the epidemic spread by reducing $R_0$, and (b) suppression, which aims to reverse epidemic growth by reducing $R_0$ below 1. Each policy has major challenges. Ferguson et al, 2020 show that optimal mitigation policies (combining home isolation of suspect cases, home quarantine of those living in the same household as suspect cases, social distancing of the elderly and others at most risk of severe disease and use of masks, sanitization & handwashing) might reduce peak healthcare demand by two-thirds and deaths by half. In this scenario, population immunity builds up through the epidemic, leading to an eventual rapid decline in case numbers and transmission dropping to low levels. However, the resulting mitigated epidemic would still likely result in hundreds of thousands of deaths and health systems (most notably intensive care units) being overwhelmed many times over – given that CFR for COVID-19 was high. The death toll of COVID-19 is dreadful, both for those who lose their lives and for their family, friends, colleagues and all whom their lives touched. It would have an adverse impact on economic activity too in terms of loss of productive lives.

1.9 Suppression in the form of national lockdowns carries with it enormous social and economic costs, which may themselves have significant impact on health and well-being in the short and longer-term. Evidence shows that population-wide social distancing would have the largest impact; and in combination with other interventions – notably home isolation of cases and school and university closure – has the potential to suppress transmission below the threshold of $R_0$=1 required to rapidly reduce case incidence.

### Uncertain COVID-19 Parameters in March 2020

1.10 In Epidemiology, two factors are particularly important for evaluating the severity of a contagious disease: first, CFR or the fraction of individuals infected who lose their life due to the disease; second, the basic reproduction number $R_0$ - the expected number of new cases of the disease caused by a single individual. However, both the indicators were uncertain at the onset of the pandemic and showed wide variation. The CFR was as high as 12 per cent in Italy while the world average was 6 per cent in March, 2020 (Figure 3a). Various studies showed that COVID-19 had a higher range of $R_0$, than many recent viruses, which aggravated the risk of its contagion (Figure 3b). Another key factor regarding uncertainty in both the CFR and $R_0$ was the fact that many cases were initially asymptomatic. This made it very difficult to ascertain the true number of individuals infected with COVID-19, and hence determine the CFR and $R_0$.

**Figure 3: Wide Variation in Critical Parameters of COVID-19**




Source: Compiled from various sources

1.11 When faced with enormous uncertainty, policies must be designed with the objective of minimizing large losses by selecting the policy that would be optimal under the worst-case scenario (Hansen and Sargent, 2001). This assumed significance given the significant uncertainty around the critical parameters that a priori made it difficult for policy makers to weigh the health benefits of various strategies against their economic damages (Barnett et al, 2020). COVID-19, therefore, presented before the world in March 2020 the predicament of which strategy to choose and whether to save 'lives' or 'livelihoods'.

## Higher Speed of Transmission Potential in Dense Areas

1.12 The virus would be transmitted faster when people live in close vicinity or work in close physical proximity in factories, or in service sectors with face-to-face interactions with the public (Box 2). Two important factors that, then, become significant are the absolute population and population density. This is because higher the proxmity between people, higher is the likelihood that an infected person carrying the virus will make contact with a susceptible person. Transmission events occur through contacts made between susceptible and infectious individuals in either the household, workplace, school or randomly in the community, with the latter depending on spatial distance between contacts. This is evident in the spread of COVID-19 wherein countries with higher population have shown higher caseloads and higher fatalities while countries with higher population density have shown higher caseloads though fatalities do not vary much with population density (Figure 4).

**Figure 4: Correlation between COVID-19 and Population Parameters**

**Figure 4a: Total Confirmed Cases and Population**

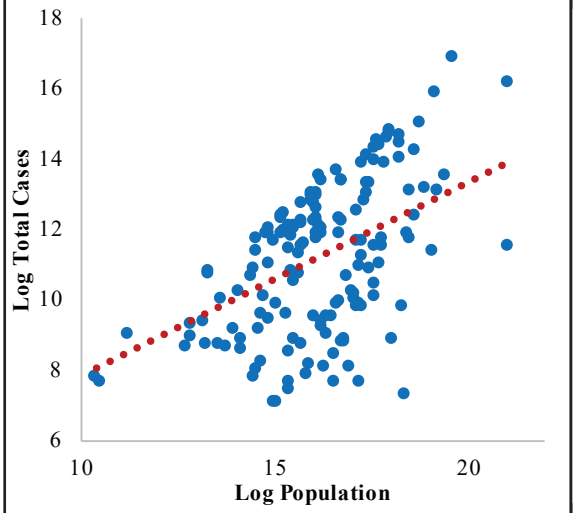



**Figure 4b: Total Confirmed Cases and Population Density (per sq.km)**

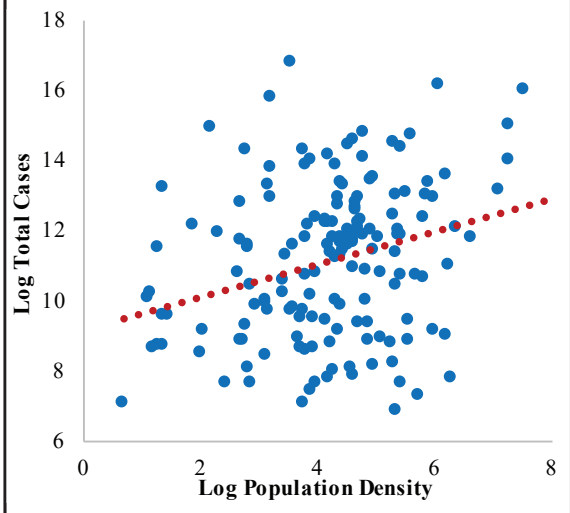



**Figure 4c: Total Deaths and Population**

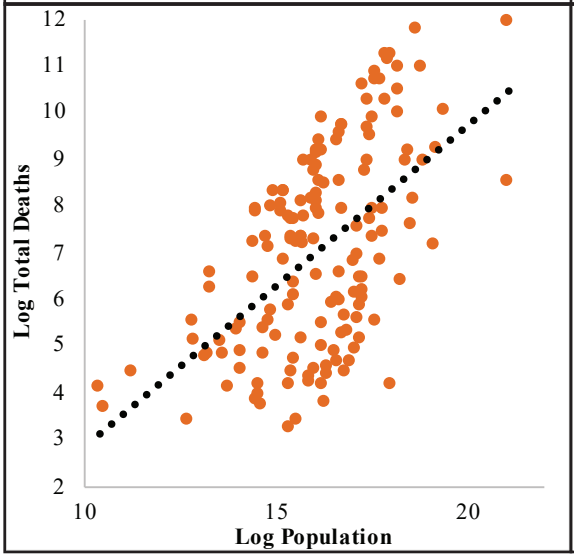
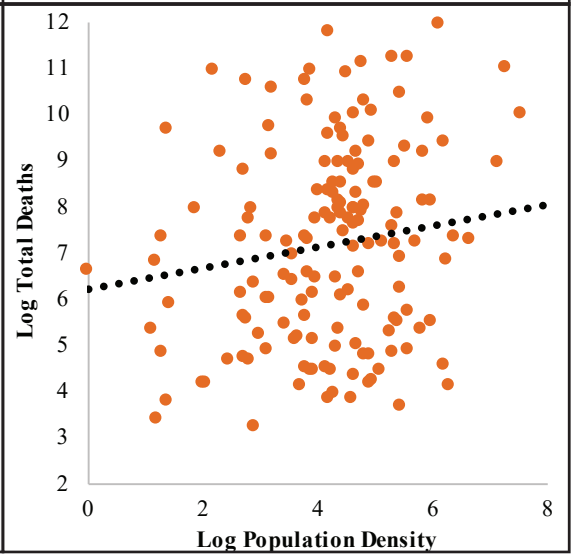



**Figure 4d: Total Deaths and Population Density (per sq.km)**




Source: Data accessed from World Health Organization as on 31st December, 2020
Note: Top 160 countries in terms of cases and deaths have been taken for the analysis.

## Box 2: Network Effects of a Pandemic

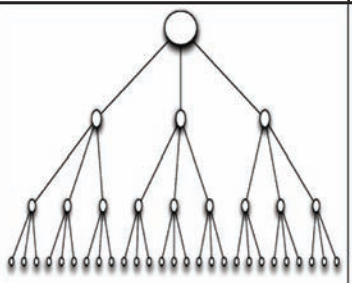
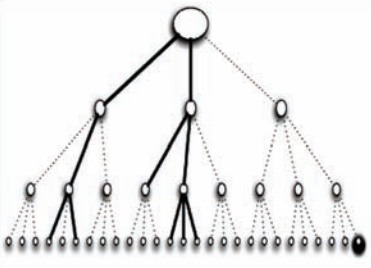
The transmission potential of an epidemic is measured by the basic reproduction number, $R_0$ - the expected number of new cases of the disease caused by a single individual. $R_0$ is an interplay between the number of people an infected person meets (k) and the probability with which he spreads the infection to the person he comes into contact with (p). Small changes in (k) and (p) can have a large effect when $R_0$ is near 1. Suppose $R_0$ is very slightly below 1, and any one of the factors increases by a little bit; the result could push $R_0$ above 1, suddenly resulting in a positive probability of an enormous outbreak. The same effect can happen in the reverse direction as well, where slightly reducing the contagiousness of a

disease to push $R_0$ below 1 can eliminate the risk of a large epidemic. This indicates that around the critical value $R_0 = 1$, it can be worth investing large amounts of effort even to produce small shifts in the basic reproductive number by controlling each of the two factors.

Both (p) and (k) would be impacted by the network structures in a population. Infectious diseases spread through the human social network, and network effects are significant in influencing the spread of disease (David Easley & Jon Kleinberg, 2010). The patterns of spread of epidemics are determined not just by the properties of the pathogen carrying it — including its contagiousness, the length of its infectious period, and its severity — but also by network structures within the population it is affecting. The social network within a population, i.e., the modes of interaction determines a lot about how the disease is likely to spread from one person to another.

The opportunities for a disease to spread are given by a contact network: there is a node for each individual/organization, an edge if two people come into contact with each other in a way that makes it possible for the disease to spread from one to the other and a path linking nodes to edges. A network is said to be connected if any individual (or node) can be reached from any other by following network links; epidemiologically, this is equivalent to infection being able to reach the entire population from any starting point. In this way, each infected individual is linked to one other from whom they caught the infection, and additionally, to a variable number of others to whom they transmitted the disease, thus providing a 'transmission network' consisting of all the links through which infection spread in a single outbreak. For a highly contagious disease, involving airborne transmission based on coughs and sneezes, the contact network will include a huge number of links, including any pair of people who sat together on a bus or an airplane. Thus, network structures in a society become very significant in modelling the spread of a contagious disease and probability of its turning into an epidemic/pandemic.

**Mode of Contagion of an Epidemic**

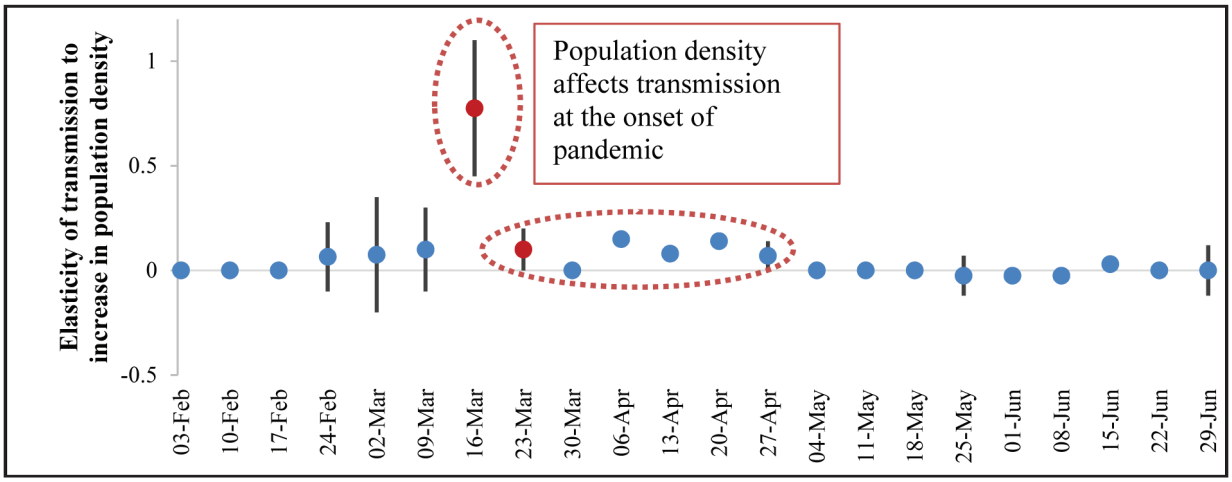
| A Contact Network | High Contagion Probability - the Infection Spreads Widely | Low Contagion Probability, the Infection is Likely to Die Out Quickly |
|---|---|---|
|  |  |  |

Adapted from David Easley & Jon Kleinberg, 2010
Note: Bold lines implies spread of infection in the contact network

These epidemic models on networks help to determine the features affecting spread, how interaction within networks can be restricted, and in particular, how it is possible to reduce spreading by means of public health measures such as vaccination, (quicker) diagnosis and treatment, isolation, travel restrictions and so on. A key priority is, therefore, the early and rapid assessment of the transmission potential of any emerging infection.

1.13 For COVID-19 in particular, studies show that density and city size aggravate its spread (Stier et al., 2020; Ribeiro et al., 2020). In dense areas, commuters make more extensive use of public transport. The physical proximity and grouping of people in public transport may also be a source of contagion (Harris, 2020). A study on pattern of spread in the U.S. shows that higher population density is associated with higher transmission rates of the virus (Gerritse, 2020) - population density that is twice as high yields about 0.7 points higher transmission rates (Figure 5). It also shows that the role of population density in transmission peaks during early phase of the pandemic: population density is more strongly linked to high transmission rates in March than it is in April or May. This signifies that denser areas are more vulnerable to faster spread of the virus and this effect is stronger at the onset of the epidemic. This had important policy implications in terms of early measures to prevent spread for a densely populated country like India with more than 130 crore people and a population density of 382 persons per square km versus the global average of 58 persons per square km.

**Figure 5: Population Density Affects Transmission in Early Phase of Pandemic**




Source: Adapted from Gerritse (2020) (Based on study on pattern of spread in the U.S.)

## Efficacy of Lockdowns in a Pandemic: Learnings from Spanish Flu

1.14 Given the uncertainty and potency of the COVID-19 virus, it was prudent to learn from any earlier experience. The Spanish flu pandemic of 1918-19, was one of the deadliest in world history with peak of worldwide mortality in modern times, as it infected around 500 million persons, or about one-third of the world's population, and killed anywhere from 50 to 100 million people (Barro et al, 2020). Like COVID-19, the Spanish flu was highly contagious; it was also unusually lethal for young, "prime-age" adults, especially men. It came in three waves beginning in the spring of 1918. The second wave, in the fall of 1918, was the largest by far in terms of total infections and deaths. A third wave occurred in the spring of 1919. The pandemic began during World War I, and the virus is thought to have been introduced and spread throughout the United States by soldiers returning from Europe. Lockdowns implemented in 1918 resemble many of the policies used to reduce the spread of COVID-19, including school, theater, and church closures, public gathering and funeral bans, quarantine of suspected cases, and restricted business hours. Other public health interventions used were emphasis on hand-washing, sanitization practices and social/ physical distancing.

**Box 3: How Handwashing began as a Medical Experiment**

Due to COVID-19, handwashing received attention once more after nearly 170 years. It may be unbelievable today, but nearly 200 years ago, doctors did not wear gloves for surgeries and the concept of germs was not known. The germ theory was proposed by Louis Pasteur in 1885.

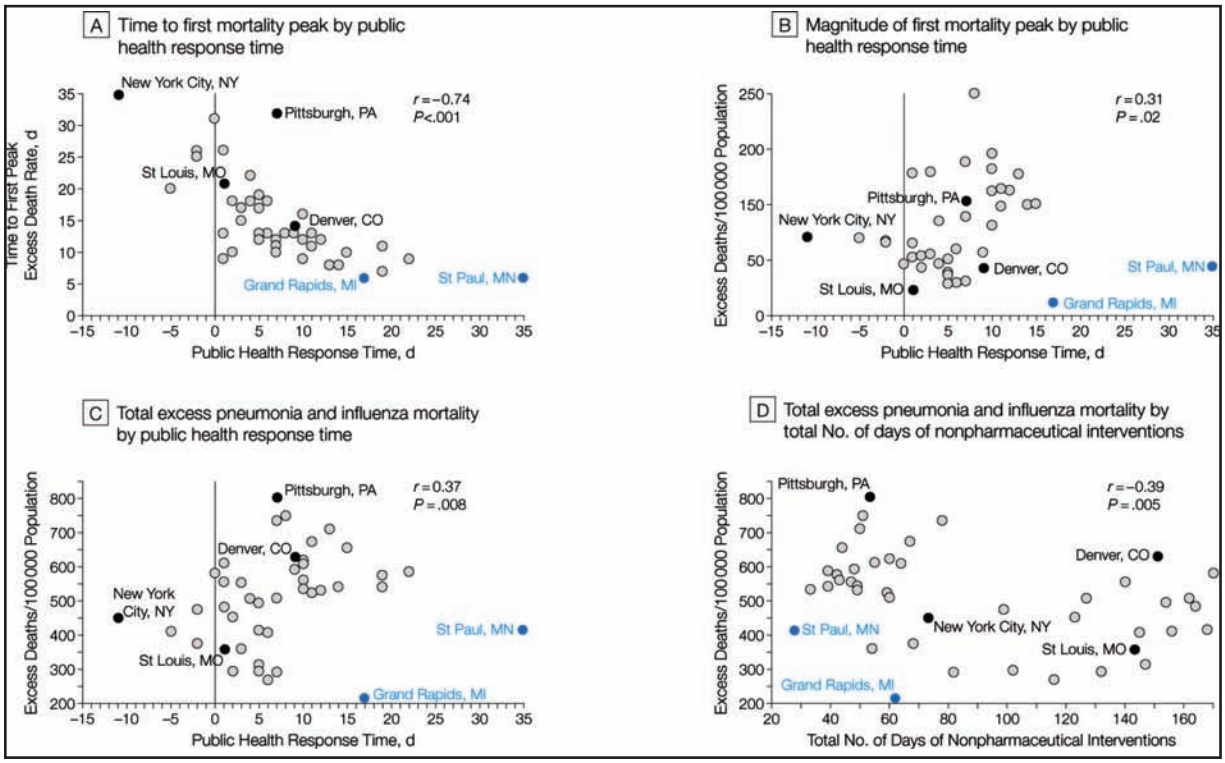
It all started when a young Hungarian physician Ignaz Semmelweis in the obstetrics department of Vienna Hospital is 1846 found, to his surprise, that the mortality rate of his division was sevenfold higher than that of another obstetrics division staffed exclusively by midwives. Upon further investigation, he found that the physicians would start their day by conducting autopsies and then proceeding to labour rooms for conducting deliveries, without cleaning their hands. The nurses and midwives, on the other hand, started their days with deliveries. He then introduced a handwashing policy for all physicians and medical students before they entered the labour room, and within a year, the mortality was brought down to one-sixth of the former number. This was the first scientific proof that handwashing helped in preventing infection, though this did not immediately become popular among doctors. Today, Ignaz Semmelweis is considered the father of hand hygiene and infection control in hospitals.

During the SARS outbreak in 2002-04, the authorities in Hong Kong had advised the public to wash their hands to prevent the spread of the disease. During the COVID-19 pandemic, handwashing has come to the rescue once again. Handwashing is considered a proven and among the most cost-effective public health interventions along with vaccination. This was recognised under the Swachh Bharat Mission in India with a focus to develop the habit of handwashing early at schools under Swachh Bharat: Swachh Vidyalaya.

1.15 The evidence comparing the containment policies of 21 cities during the 1918 H1N1 influenza pandemic shows that social distancing policies reduce transmission (Markel et al., 2007). The scatterplots in Figure 6 display the impact of (i) public health response time, which is shown as the number of days compared to the overall average; negative and lower values thus imply early lockdown while higher values imply a slow response, and (ii) the intensity of the lockdown as measured by the number of days the lockdown was employed. The figure shows that cities that implemented lockdowns earlier delayed the time to peak mortality, reduced the magnitude of the peak mortality as well as the total mortality burden. Similarly, cities that had a more intense lockdown also reduced their total mortality.

1.16 Hatchett et al., 2007 showed that cities in which multiple interventions were implemented at an early phase of the epidemic had peak death rates ~50 per cent lower than those that did not and had less-steep epidemic curves. For COVID-19 too, evidence showed that a combination of three interventions (face masks, physical distancing and handwashing) works better than a single intervention (D.Chu et al, 2020). The chances of infection were around 13 per cent when people maintained a distance of one metre – that reduced to a fifth, that is 2.6 per cent, when a distance of more than one metre was maintained.

**Figure 6: Early, Intense Lockdowns Controlled Mortality Due to the Spanish Flu**



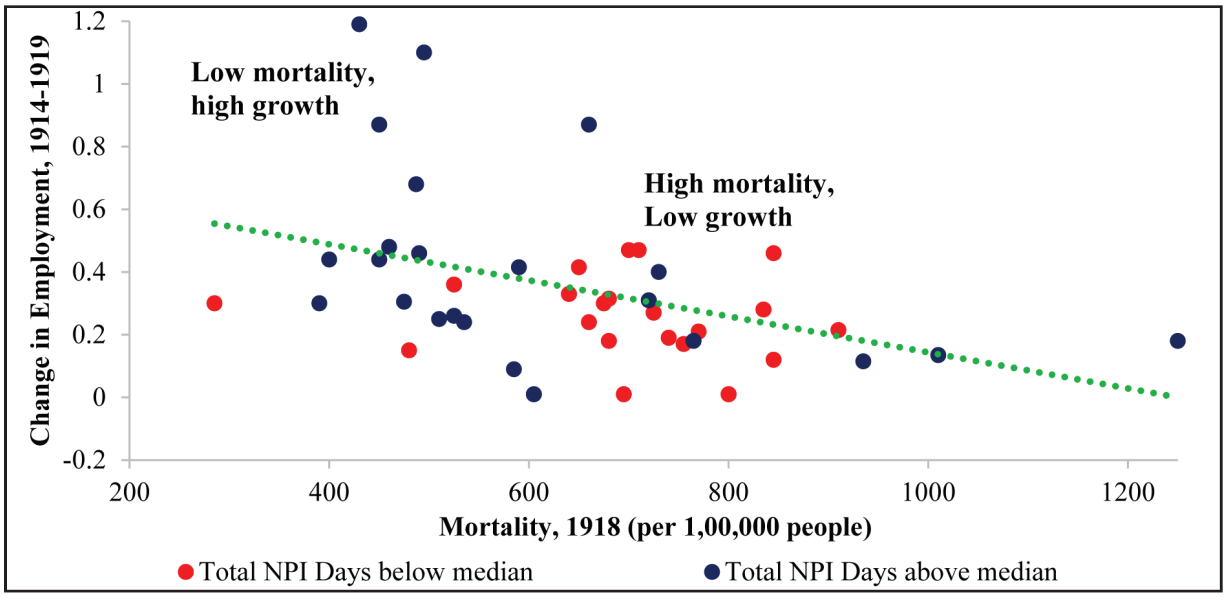

Source: Adapted from Markel et al (2007)

Note: New York and St. Louis used lockdowns promptly and were successful in increasing time to peak (A), decreasing the peak mortality rates (B) and total mortality burden due to Spanish Flu (C and D). The 2 cities represented by blue circles are outliers chosen to demonstrate that the associations shown are not perfect.

1.17 The economic effects of lockdowns could be both positive and negative. All else equal, lockdowns constrain social interactions and thus dampen any economic activity that relies on such interactions. While lockdowns lower economic activity, they have a salubrious effect by delaying the temporal effect of a pandemic, reducing the overall and peak attack rate, reducing the number of cumulative deaths, providing valuable time for production and distribution of pandemic-strain vaccine and antiviral medication and decreasing the burden on health care services and critical infrastructure. US cities' strategy during Spanish flu demonstrated how early and forceful lockdowns do not worsen the economic downturn. On the contrary, it was established that cities who intervened earlier and more aggressively experience stronger recovery in economic front in the long run.

1.18 Correia et al. (2020) use a dynamic difference-in-difference regression approach to examine the impact of lockdowns on control of the Spanish flu and consequent effect on economic activity across cities. The study found that cities that implemented lockdowns for longer tend to be clustered in the upper-left region (low mortality, high growth), while cities with shorter lockdowns periods are clustered in the lower-right region (high mortality, low growth). This suggests that lockdowns play a critical role in attenuating mortality, but without reducing economic activity and contribute to faster growth in the medium term (Figure 7).

**Figure 7: Lockdowns are Effective in Reducing both Mortality and Unemployment**




Source: Adapted from Correia et al. (2020)

1.19 It also shows that implementing lockdowns earlier in the pandemic and using them more intensely produced significantly higher rates of growth in manufacturing output and employment from 1919 to 1923 than did slower activation or less intense use of lockdowns. Estimates from the study indicates that a one standard deviation increase in the speed of adopting lockdowns (8 days) is associated with 4 per cent higher growth of employment and 5 per cent higher output after the pandemic, while a one standard deviation increase in lockdown intensity leads to 6 per cent higher employment growth and 7 per cent higher output. The findings suggest that pandemics can have substantial economic costs, and lockdowns can lead to both better economic outcomes and lower mortality rates (Figure 8).

**Figure 8: Effectiveness of Lockdowns in Enabling Faster Economic Recovery**

**Figure 8a: Duration of NPIs and Log Manufacturing Employment**

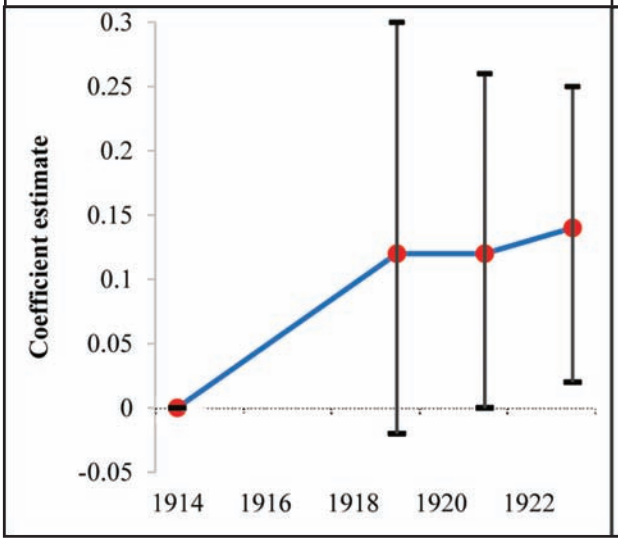



**Figure 8b: Speed of NPI and Log Manufacturing Employement**

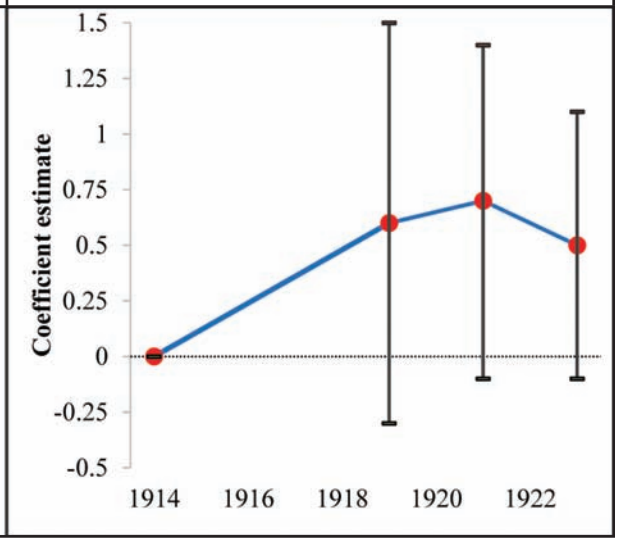


**Figure 8c: Duration of NPIs and Log Manufacturing Output**

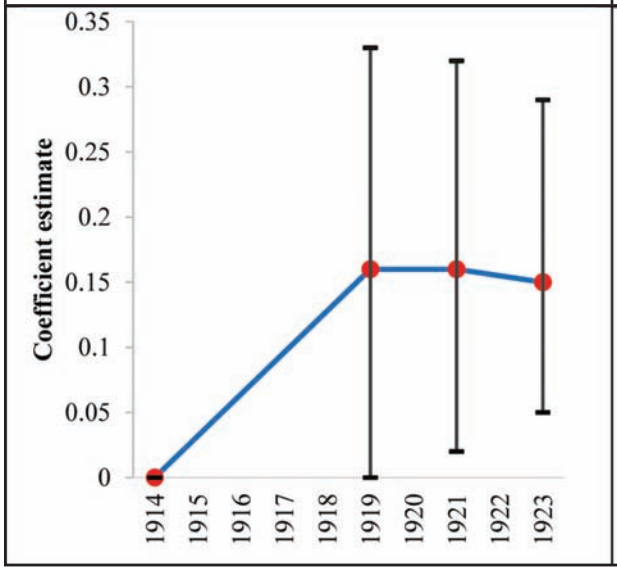
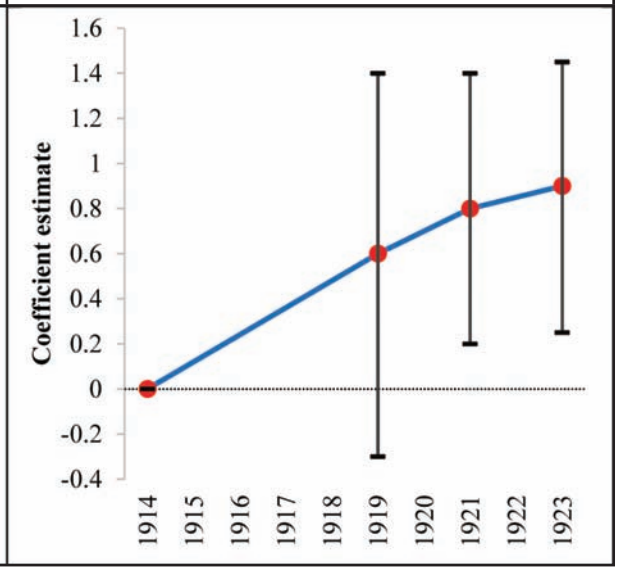



**Figure 8d: Speed of NPI and Log Manufacturing Output**




Source: Adapted from Correia et al. (2020)

1.20 Learning from the experiences of the Spanish Flu, two basic kinds of public-health measures to control spread of COVID-19 were adopted: quarantining people to reduce the quantity of people interacting and encouraging behavioral measures such as better sanitary practices to reduce the spread of germs. Several countries, therefore, resorted to use of lockdowns in the initial phase of the pandemic lockdowns of varying degrees to ensure that people stayed at home, minimizing the spread of the infections.

1.21 The above learnings from research in epidemiology and economics, especially the research focused on the Spanish Flu, guided India's policy response. In sum, the learnings were as follows:

a. The pandemic curve needs to be 'flattened' to spread the pandemic over time and enable more people to receive proper health treatment, thereby lowering the fatality rate ultimately.

b. Given the network structures that affect the transmission of the pandemic, higher population can lead to faster spread of the pandemic.

c. Denser areas are more vulnerable to faster spread of the virus and this effect is especially strong at the onset of the pandemic.

d. Early lockdowns delay the time taken to reach the peak, reduces the magnitude of the peak, and thereby decreases the total mortality burden by providing valuable time to ramp up the health and testing infrastructure.

e. Implementing lockdowns earlier in the pandemic and using them more intensely – while costly in the short-run – led to a much sharper economic recovery and reduced mortality as well.

f. When faced with enormous uncertainty, policies must be designed with the objective of minimizing large losses by selecting the policy that would be optimal under the worst-case scenario.

## INDIA'S HUMANE POLICY RESPONSE: SHORT-TERM PAIN, LONG-TERM GAIN

1.22 In the absence of a potent cure, preventive vaccine; interplay of network structures in densely populated areas, and a high CFR, India weighed the costs and opportunities strategically. The limits of scientific understanding of the disease, lack of good data on the mode of spread and potency of the virus made it difficult to model the likely impact of different policy options in a reliable and timely way. To aggravate the uncertainty, it was estimated that India would have 30 crore cases and several thousand deaths by the end of May, 2020 (Klein et al., 2020).

1.23 Given that India is the second largest populated country in the world with a high density, the transmission potential of COVID-19 was high. The pace of spread of the virus through contact, probable transmission from asymptomatic cases, the disproportionately higher mortality seen among individuals of the age more than 60 years and the escalation of the pressure on the health infrastructure of many developed countries were alarming and increased the potential threat to 'lives'. In the absence of both a vaccine and a treatment, failing to impose restrictions on the free movement of individuals during the pandemic would have exposed the population to a contagious threat, thereby leading to deaths in enormous numbers. However, the economic impact of the lockdowns and closure of economic activity would have adversely impacted the 'livelihoods' of people. COVID-19, therefore, posited complex and multi-faceted health and socio-economic trade-offs for policymakers – whether to save 'lives' or 'livelihoods'.

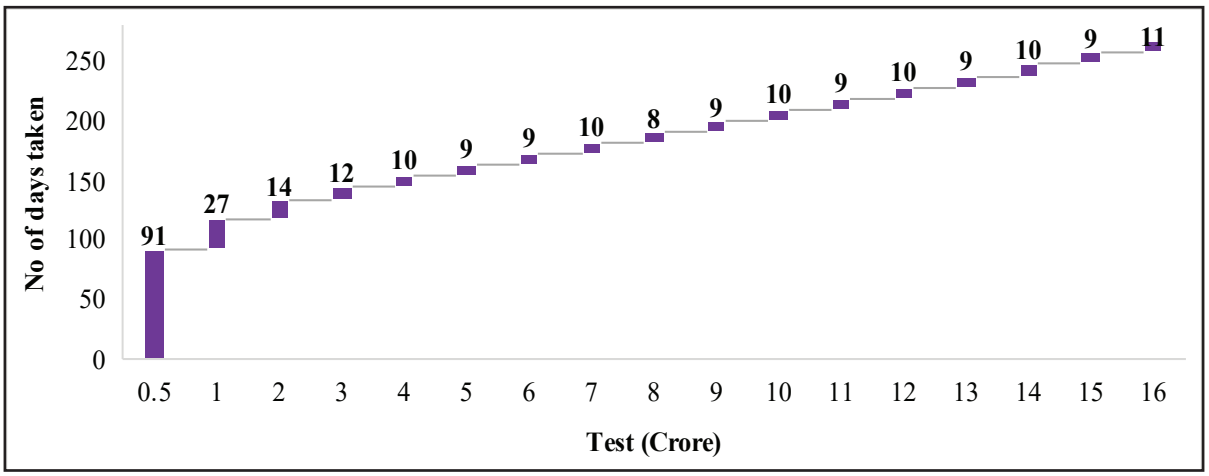
1.24 Evidence showed that the timing of intervention was crucial as population density plays a crucial role in aggravating spread at the onset of a pandemic and that speed and duration of lockdowns help in keeping mortality in control. Learning from the Spanish Flu experience also showed that timing matters - early and extensive lockdowns led to greater delays in reaching peak mortality, lower peak mortality rates and overall lower mortality burden. Swift lockdowns also had no adverse effect on local economic outcomes. On the contrary, cities that intervened earlier and more aggressively experience a relative increase in real economic activity after the pandemic.

1.25 Given the 'black swan event' marked by sheer uncertainty and once in a century crisis, Indian policymakers followed an approach similar to the Barbell strategy in finance – hedging for the worst outcome initially, and updating its response step-by-step via feedback. The clear objective of 'Jaan Hai to Jahan hai' and to 'break the chain of spread' before it reaches 'community transmission' helped the government face the dilemma of 'lives vs livelihood', pace the sequence of policy interventions and adapt its response as per the evolving situation. India was amongst the first of the countries that imposed a national lockdown when there were only 500 confirmed cases. The stringent lockdown in India from 25$^{th}$ March to 31$^{st}$ May was necessitated by the need to break the chain of the spread of the pandemic. This was based on the humane principle that while GDP growth will come back, human lives once lost cannot be brought back.

1.26 The 40-day lockdown period was used to scale up the necessary medical and para-medical infrastructure for active surveillance, expanded testing, contact tracing, isolation and management of cases, and educating citizens about social distancing and masks, etc. The lockdown provided the necessary time to put in place the fundamentals of the '5 T' strategy - Test, Track, Trace,

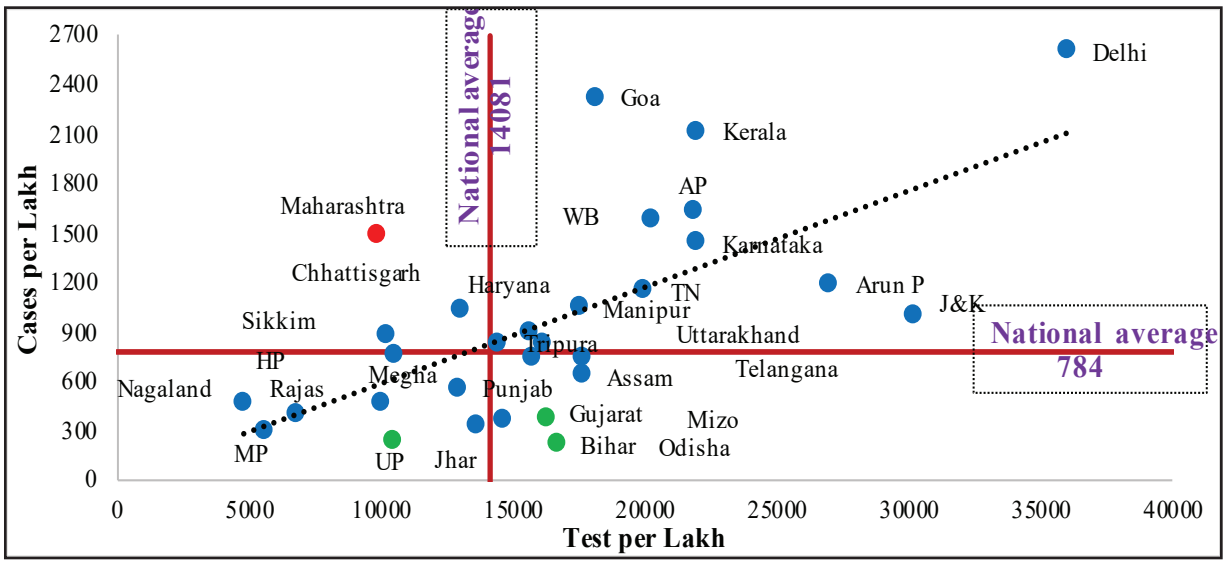
Treat, Technology. As the first step towards timely identification, prompt isolation & effective treatment, higher testing was recognized as the effective strategy to limit the spread of infection. At the onset of the pandemic in January, 2020, India did less than 100 COVID-19 tests per day at only one lab. However, within a year, 10 lakh tests were being conducted per day at 2305 laboratories. The country reached a cumulative testing of more than 17 crore in January, 2021. The sharp decline in the number of days to add the next cumulative 1 crore tests show the dedicated efforts to expand the testing infrastructure (Figure 9). The requisite resources of PPEs, masks and sanitizers were also expanded at a fast pace. The emphasis placed on testing is corroborated in Figure 10, which shows that States that ramped up the testing facilities were able to control the spread of COVID-19.

**Figure 9: Ramping up Testing Facilities in India**




Source: Data accessed from https://www.Covid19india.org/, Ministry of Health and Family Welfare (MoHFW)

**Figure 10: Ramped up Testing Effective in Control of COVID-19**




Source: Data accessed from Covid19india.org, MoHFW – data as on 31st December, 2020

1.27 The districts across India, based on number of cases and other parameters were classified into red, yellow and green zones. Across the country, 'hotspots' and 'containment zones' were

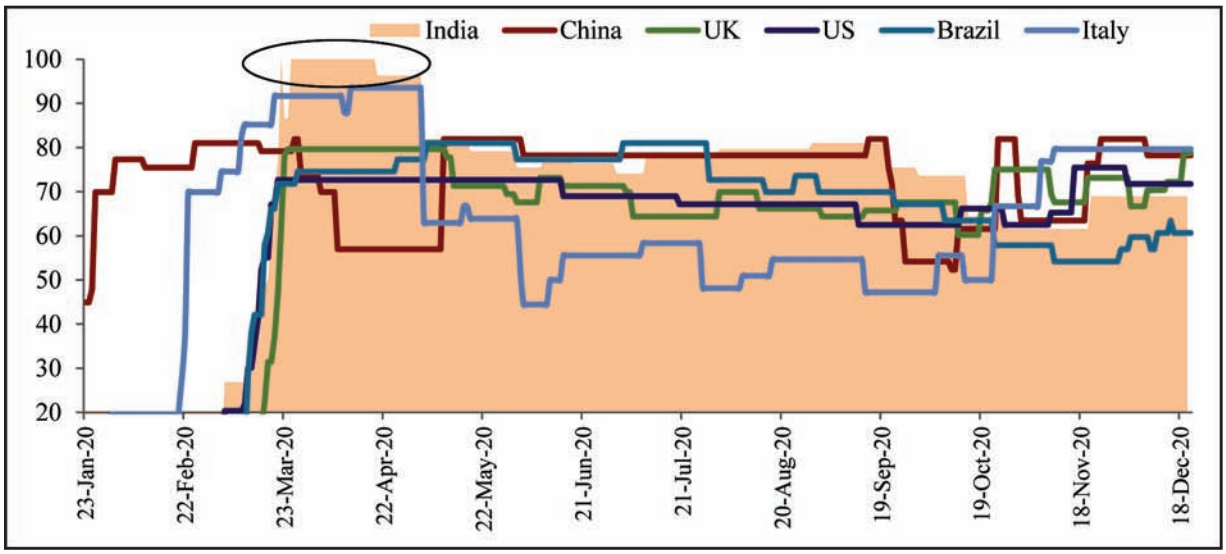
identified – places with higher confirmed cases increasing the prospect of contagion. This strategy was increasingly adopted for intensive interventions at the local level as the national lockdown was eased. This enabled a smooth transition to 'Jaan bhi aur Jahan bhi'.

1.28 The analysis in the chapter makes it evident that India was successful in flattening the pandemic curve, pushing the peak to September. India managed to save millions of 'lives' and outperform pessimistic expectations in terms of cases and deaths. It is the only country other than Argentina that has not experienced a second wave. It has among the lowest fatality rates despite having the second largest number of confirmed cases. The recovery rate has been almost 96 per cent. India, therefore, seems to have managed the health aspect of COVID-19 well.

## EFFICACY OF INITIAL LOCKDOWN IN CONTROLLING THE PANDEMIC

1.29 COVID-19 prompted a wide range of responses from governments around the world. The Oxford COVID-19 Government Response Tracker (OxCGRT), provides a systematic way to track government responses to COVID-19 across countries. Common lockdowns used included school closings, travel restrictions, bans on public gatherings, emergency investments in healthcare facilities, new forms of social welfare provision, contact tracing, wide scale testing and other interventions to contain the spread of the virus, augment health systems, and manage the economic consequences of these actions. However, government policy responses have varied substantially—both across countries, and often within countries—in the measures that they have adopted and how quickly they have adopted them. As is evident from Figure 11, the policy response in top major five affected countries varied over time. India imposed the most stringent lockdown (equal to 100 as per the index) for around a period of forty days from late March to early May – this was when it had total cases of only around 500-600 cases. As a comparison, stringency in US was around 72 only during that period when it already had 1 lakh cases. As on date, India has a declining trend in daily new cases which has dropped below 20,000 and lowest CFR despite having second largest number of total cases. US is still seeing around 2 lakh daily new cases.

**Figure 11: Variations in Stringency of Lockdowns in Top 5 Countries**

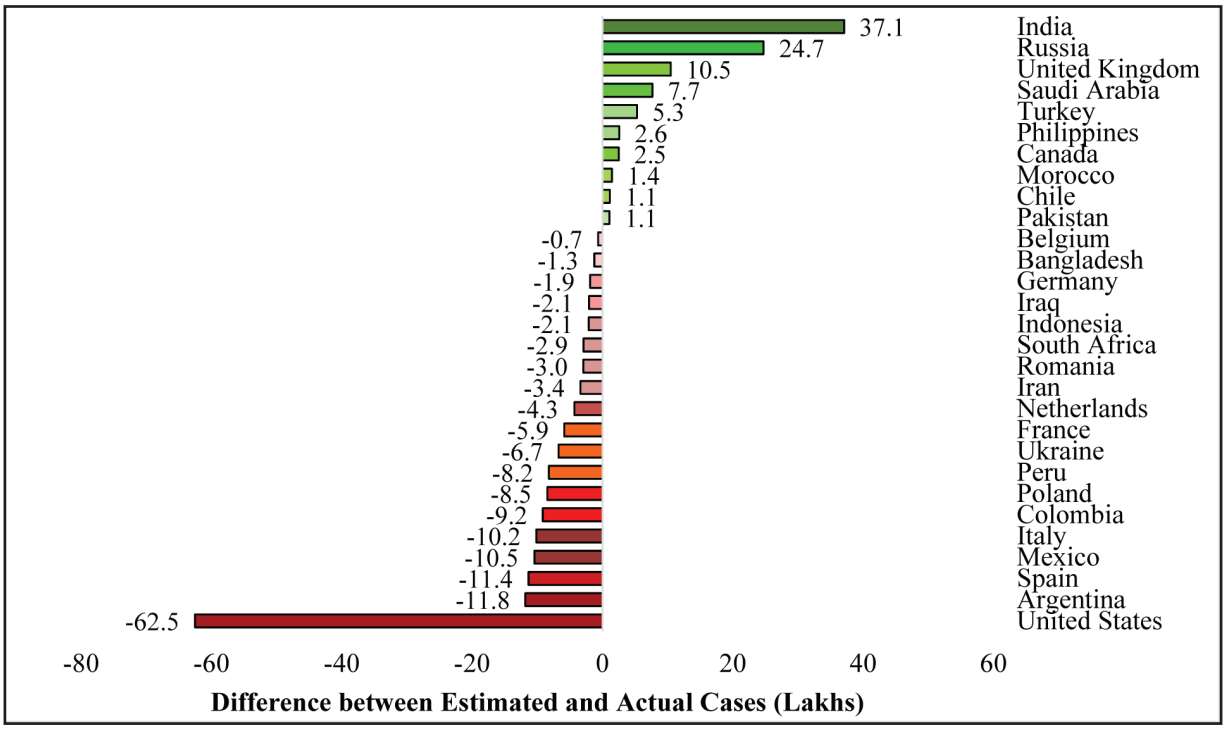



Source: Oxford COVID-19 Government Response Tracker – data as on 31st December, 2020

## Cross-Country Analysis

1.30 Survey has analyzed if the policy response across countries was effective in controlling the spread of the pandemic and associated fatalities across countries. To assess this, the counter-factual is estimated, i.e., what would have been the natural caseload and associated fatalities purely based on the population, population density and the demographics of the population. Given the network effects that affect the spread of the pandemic, the size of the population, population density as well as the demographics, especially the proportion of the elderly population, affect the caseload across countries. Moreover, the number of tests conducted also impact the caseload. Therefore, using a panel regression model, natural expected per capita cases has been estimated using mentioned explanatory variables (Box 4). A second regression model is used to estimate the effect on per capita fatalities of the number of cases per capita, the proportion of elderly who are more likely to suffer fatal consequences than other sections of the population as well as the health infrastructure as captured by the number of hospital beds per capita. The sample includes the top 30 countries in terms of total confirmed cases, which represent 86 per cent of the world caseload, from March to December 2020 (details of the model are in Box 4). After estimating the natural caseload and fatalities, the actual cases and deaths are compared with these estimates. The analysis shows that India has been able to effectively manage both the spread of COVID-19 and the fatalities. India has 37.1 lakh less cases than what was estimated by the model while the actual cases in US are more than the estimated cases by 62.5 lakh cases (Figure 12).

**Figure 12: Management of COVID-19 across Countries (Measured as Actual Cases *vis-à-vis* Naturally Expected)**




Source: Survey calculations; Positive (negative) number implies actual cases less (more) than naturally expected

**Box 4: Assessing the Management of COVID-19 across Countries and within States in India**

To assess the effectiveness of the policy response to COVID-19, we have to estimate the counter-factual, i.e., what would have been the natural caseload and associated fatalities purely based on the population, population density, the demographics of the population and the number of tests conducted. Using a regression model, we estimate the effect on per capita cases of each of these explanatory variables. Our sample includes the top 30 countries in terms of total confirmed cases, which represent 86 per cent of the world caseload, from March to December 2020.

We estimate the following panel regression model:

$$Log\ (No\ of\ total\ cases\ per\ lakh_{ct}) = \alpha_1 + ß_1 * Log\ (population_c) + ß_2 * Log(population\ density_c) + ß_3 * log(Total\ tests\ per\ lakh_{ct}) + ß_4 * Log\ (\%\ of\ population\ above\ 60\ years_c) + ß_5 * Log\ (\%\ of\ population\ between\ 0\text{-}14\ years_c) + ß_6 * Log\ (\%\ of\ population\ between\ 15\text{-}59\ years_c) + \varepsilon_{ct}\ ,$$

where c denotes country and t denotes month. Note that the inclusion of the log of proportion of the population above 60 years, 0-14 years and that between 15-59 years does not generate a problem of multi-collinearity as the log transformation ensures that these variables are not linearly dependent. In other words, log $x_1$, log $x_2$ and log $(1\text{-}x_1\text{-}x_2)$ are not linearly dependent.

The following panel regression model has been estimated to estimate deaths using the same group of countries:

$$Log(new\ deaths\ per\ lakh_{ct}) = \alpha_t + ß_1 * Log\ (No\ of\ total\ cases\ per\ lakh_{ct}) + ß_2 * Log\ (\%\ of\ population\ above\ 60_c) + ß_3 * Log(No\ of\ beds\ per\ 1000\ pop_c) + \varepsilon_{ct}$$

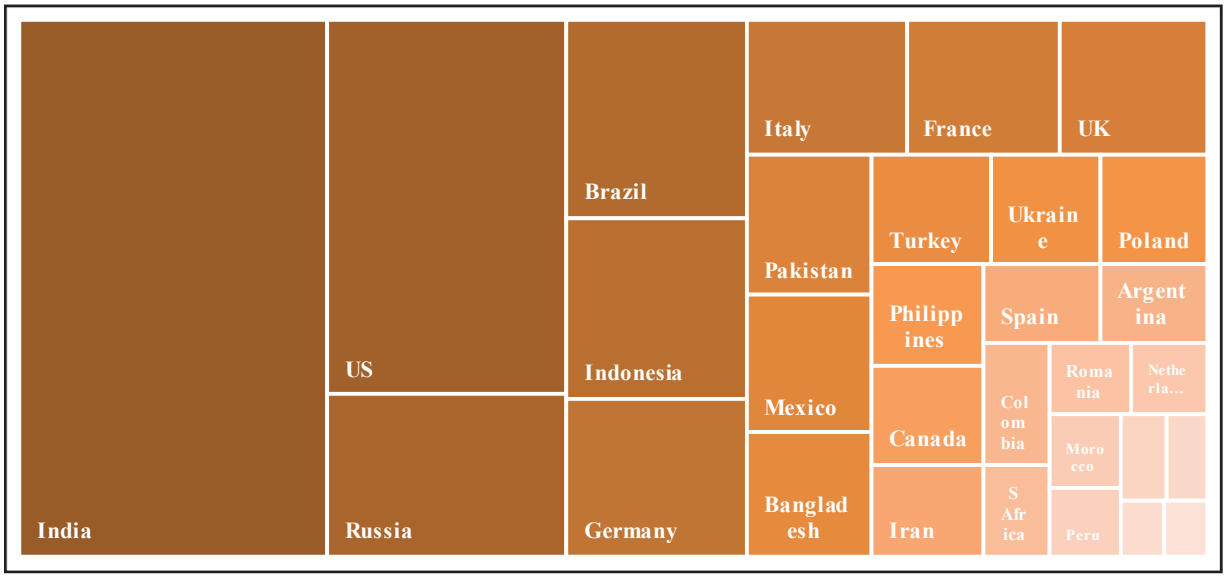
where c denotes country and t denotes time period.

As COVID-19 has been more lethal on aged population, taking into account per cent of population above 60 years helps us to control for demographic heterogeneity across countries. The number of beds per thousand has been taken as a proxy for health facilities that affects the number of deaths.

Similar models were estimated across 30 Indian States and Union Territories as well. In this model, c denotes States instead of countries.

1.31 Although all age groups are at risk of contracting COVID-19, older people face significant risk of developing severe illness if they contract the disease due to physiological changes that come with ageing and potential underlying health conditions. Though India has a young population with only around 10 per cent share of people above 60 years of age, the population of people above 60 years of age is significantly higher in India than in any of the 30 countries that account for 86 per cent of the cases (Figure 13). If we take the total cases in India as estimated by the analysis above and apply the CFRs of countries with comparable proportion of old age people and CFRs of some worse affected countries, it is evident that India has been able to save a large number of lives (Figure 14).

**Figure 13: Elderly Population (above 60 Years of Age) is Much Higher in India than Other Countries**




Source: Data accessed from World Population Prospects 2019, United Nations

**Figure 14: Estimated Lives Saved in India Using Case Fatality Rates (CFR) of Other Countries**

**Figure 14a: Using CFR of Countries with Similar Demographics**

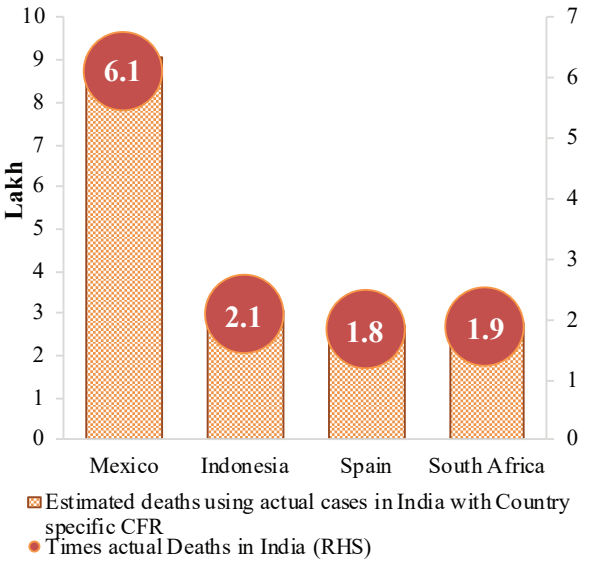
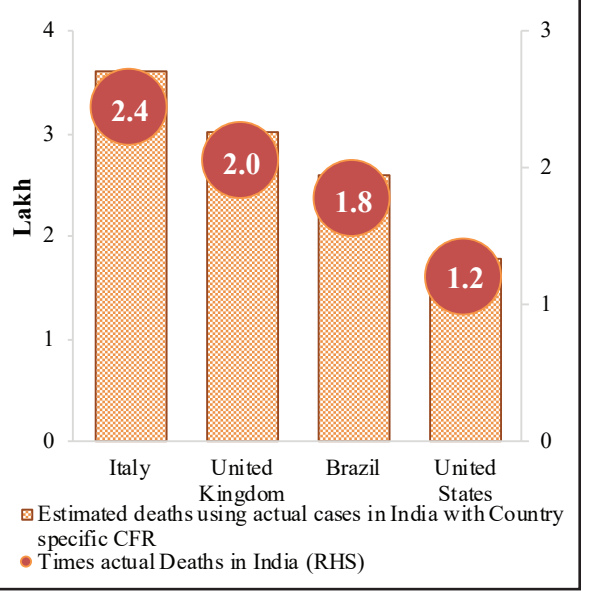


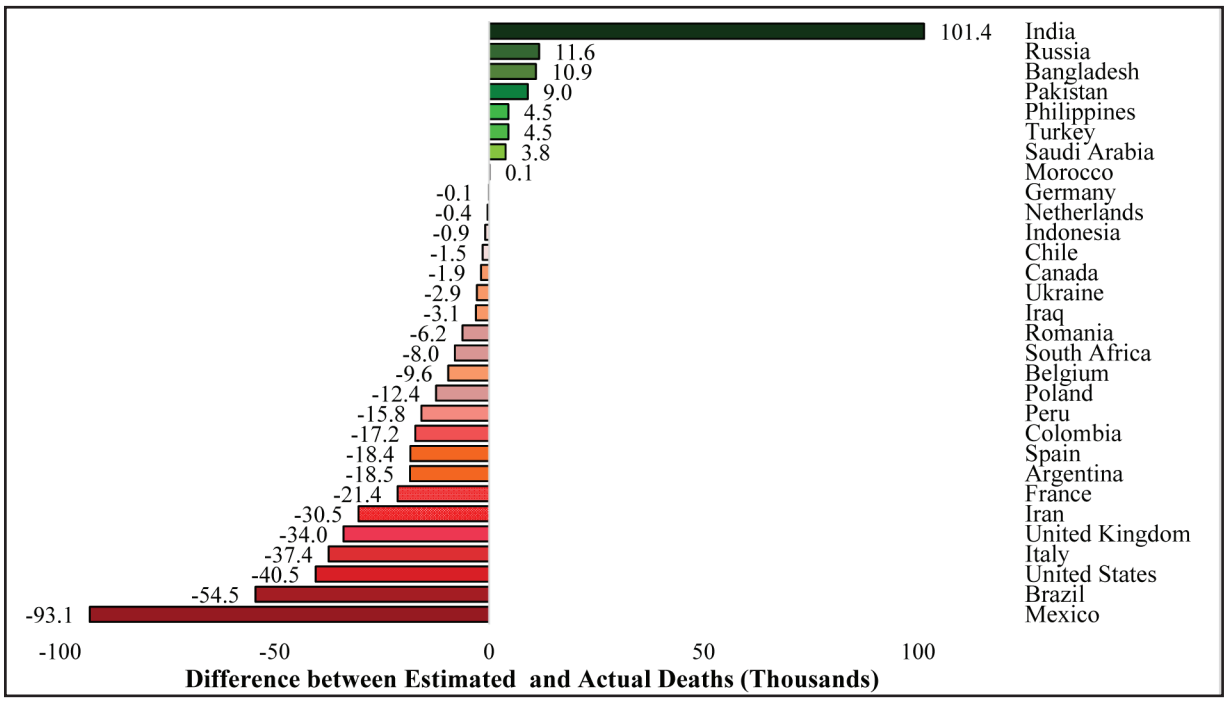

**Figure 14b: Using CFR of Worst-Affected Countries (as Measured by Total Number of Deaths)**




Source: Survey calculations

1.32 The model used for estimating the number of deaths across countries also shows that India has been successful in controlling deaths and saving lives (Figure 15).

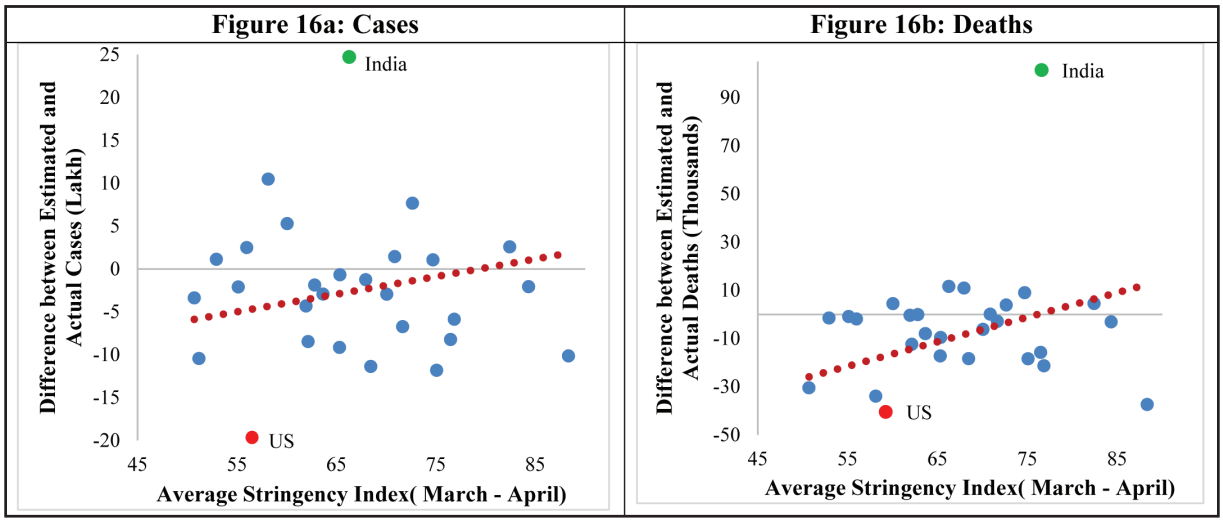
**Figure 15: Management of COVID-19 across Countries (Measured as Actual Deaths *vis-à-vis* Naturally Expected)**




Source: Survey calculations; Positive (negative) number implies actual deaths less (more) than naturally expected

1.33 Collating the results of the analysis with the stringency of lockdowns across countries show that higher initial stringency in countries in March-April, 2020 had a significant impact on controlling the number of confirmed cases and deaths (at 10 per cent level of significance). India has been a clear outlier both in cases and deaths (Figure 16).

**Figure 16: Effectiveness of Initial Stringent Lockdown in Control of COVID-19 Cases and Deaths across Countries**




Source: Survey calculations

1.34 The cross-country analysis above demonstrates clearly that the intense lockdown helped India to effectively manage the pandemic. Given the diversity within India, an inter-state analysis

is also informative to assess States that were able to manage the spread of COVID-19 well. The network impact of COVID-19 is evident in India with States with higher population and population density having witnessed higher spread of cases and weak in case of deaths (Figure 17).

**Figure 17: Correlation between COVID-19 and Population Parameters**

**Figure 17a: Total Confirmed Cases and Population**

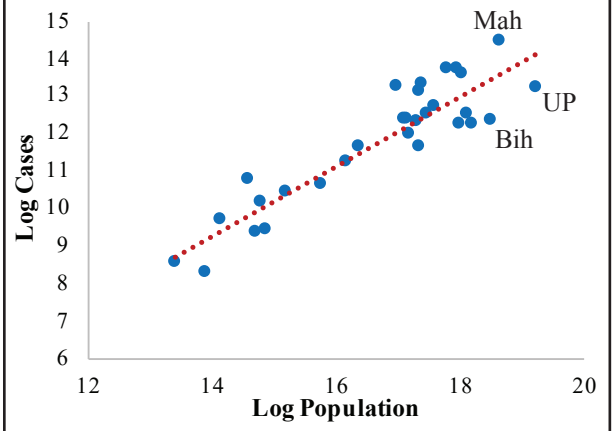



**Figure 17b: Total Confirmed Cases and Population Density (per sq.km)**

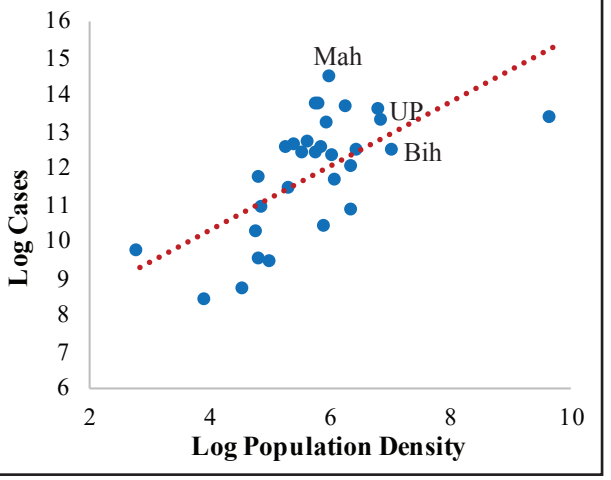



**Figure 17c: Total Confirmed Cases and Population**

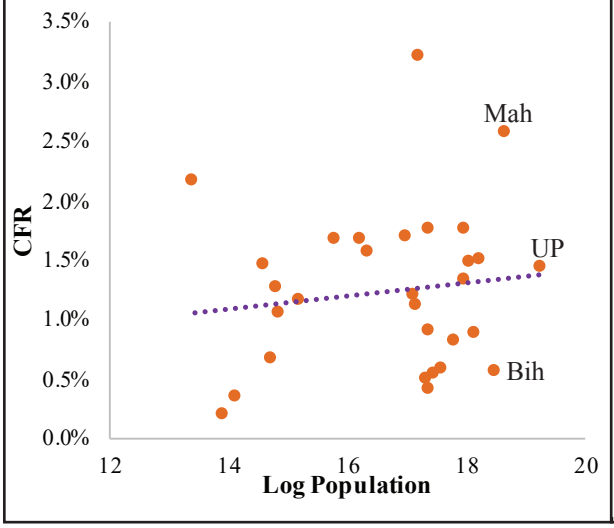
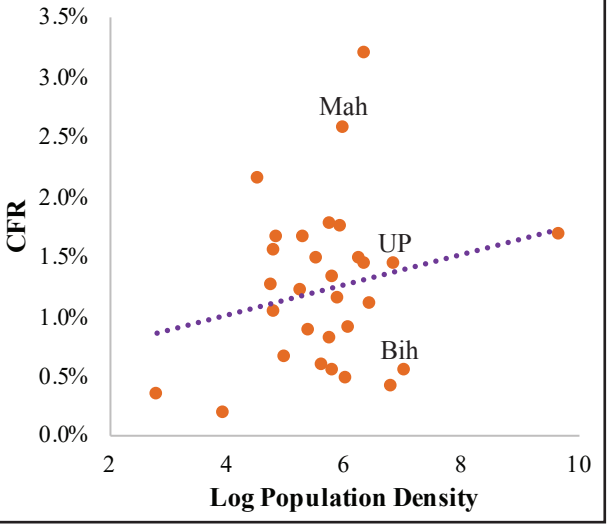



**Figure 17d: Total Confirmed Cases and Population Density (per sq.km)**

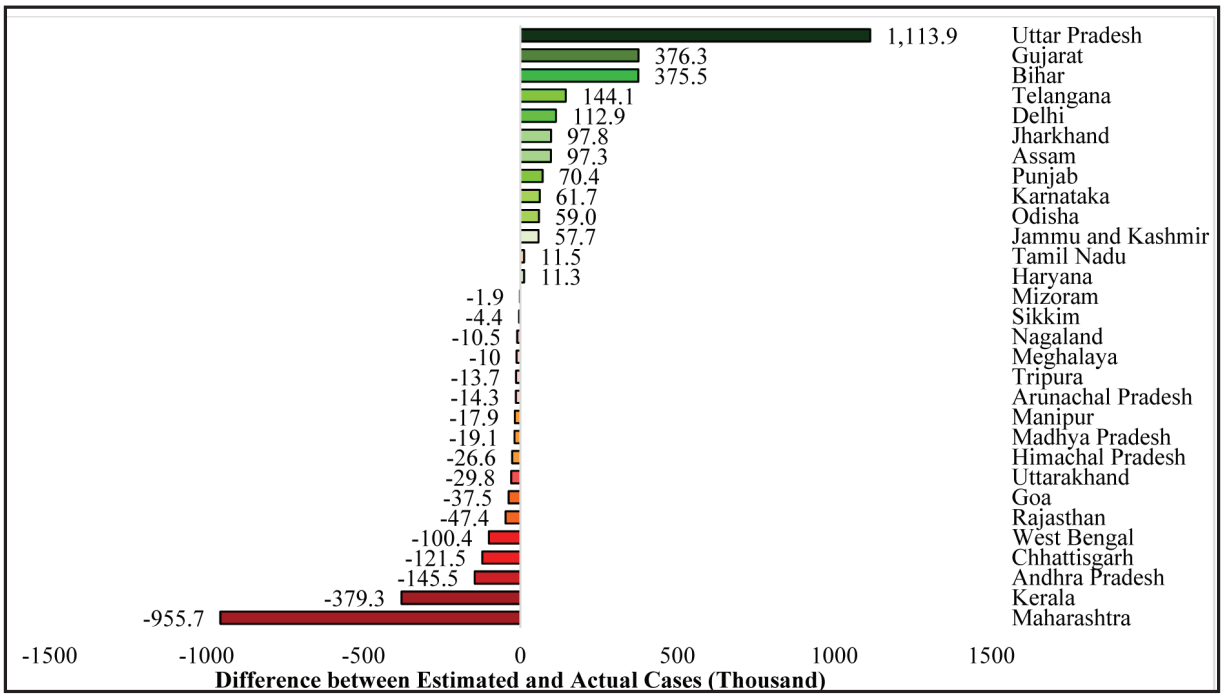



Source: Data accessed from https://www.Covid19india.org/ and MOHFW - Data as on 31st December, 2020

1.35 The model shows that Maharashtra has performed the worst in number of cases and deaths. In terms of estimated cases, Survey compares Maharashtra with Uttar Pradesh and Bihar; as seen in the top-left panel of figure 17, these three States have the most population with Bihar and Maharashtra having almost identical population. But Maharashtra has a lower population density than both Bihar and Uttar Pradesh. Yet, Uttar Pradesh and Bihar have much lower cases than what is naturally expected while Maharashtra had much higher cases. In fact, highly populous, densely populated

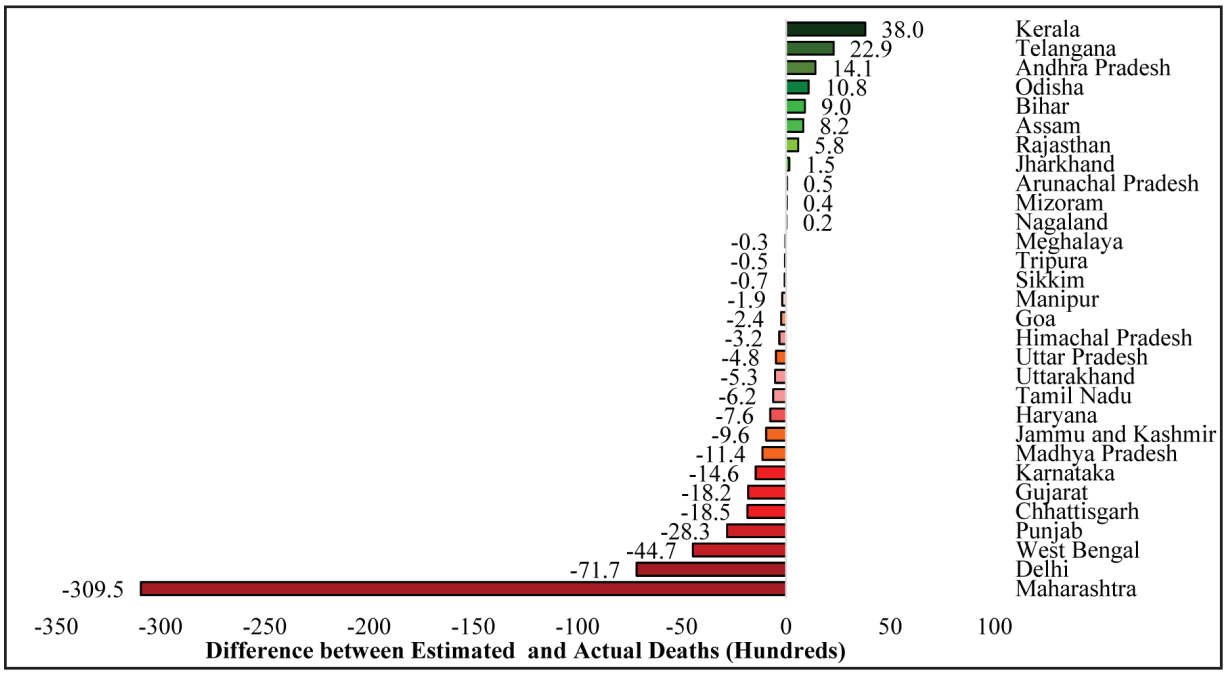
States like Uttar Pradesh (with a density of 690 persons per square km) and Bihar (with a density of 881 persons per square km) – as against the national average of population density of 382 persons per square km – have managed the pandemic well (Figure 18). This ultimately held India in good stead. In terms of deaths, Kerala, Telangana and Andhra Pradesh have managed it effectively (Figure 19).

**Figure 18: Management of COVID-19 by States in India (Measured as Actual Cases vis-à-vis Naturally Expected)**




Source: Survey Calculations; Positive (negative) number implies actual cases less (more) than naturally expected

**Figure 19: Management of COVID-19 by States in India (Measured as Actual Deaths vis-à-vis Naturally Expected)**




Source: Survey calculations; Positive (negative) number implies actual deaths less (more) than naturally expected

1.36 A measure of the COVID-19 induced restrictions imposed by governments (Centre and State) have been developed as a State-wise Stringency index (Box 5). After the nation-wide lockdown was gradually eased, States were advised to impose restrictions as per the spread of the pandemic in the State; thus the stringency of lockdown varied across States over time. Figure 20 shows that higher initial stringency in States during the period June to August has a significant impact in controlling the spread in cases and deaths (at 10 per cent level of significance).

## Box 5: Stringency Index for States in India

Objective of the stringency index is to capture the strictness of 'lockdown style' policies of respective States that primarily restrict people's behaviour. Index measures government responses by tracking 12 indicators. The information has been collated from State and Centre government specific lockdown orders, press releases, newspaper articles etc (Table B1).

**Table B1: Description of Indicators**

| No | Containment/Closure Indicators | Include/ description |
|---|---|---|
| C1 | Inter state movement | Public and private transport |
| C2 | Intra state movement | Public and private transport |
| C3 | Night Curfews | Restriction on movement/opening |
| C4 | Shops & other business establishment | Shops and industrial units |
| C5 | Services | Restaurants, Hotel & hospitality |
| C6 | Places of Worship | Temple, Masjid, Church and others |
| C7 | Entertainment | Theatres, Cinema hall, Entertainment parks |
| C8 | Personal Services | Spa, Parlor and salon |
| C9 | Work Places | Government and private offices |
| C10 | School/Colleges | School, college and educational institutions |
| C11 | Large public Gathering | Social/political/religious/academic/cultural/sports |
| C12 | Marriage & funeral gathering | People allowed in particular events |

**Table B2: Description of Indicators**

| Indicator Values | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction | No restriction |
| 1 | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP | Open with SOP |
| 2 | E pass/ Capacity restriction | E pass/ Capacity restriction | 8 hours | Capacity/ Time Restri-ctions | Capacity restriction | Capacity restriction | Capacity restriction | Capacity/ Time Restri-ctions | Capacity restriction | Voluntary Basis for higher classes | Capacity-100 | marriage 50 funeral-20 |
| 3 | Closed | Closed | More than 8 hours | Closed | Take away | Closed | Closed | Not allowed | Closed | Training Institutes/ Higher Education | less than 100 | less than 50 |
| 4 | - | - | - | - | Closed | - | - | - | - | Closed | Restricted | Restricted |

Note: SOP – Standard Operating Procedure.

Sub-indices value (Ij) from C1to C12 is derived using formula as:

$$I_j = \frac{C_j}{N_j} \times 100 \Rightarrow (1)$$

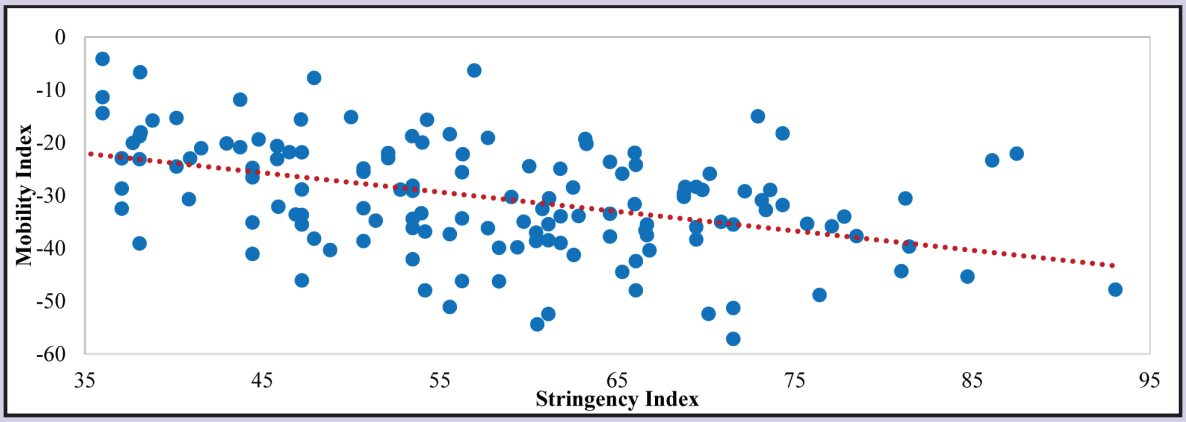
Where C stands for containment measures defined in Table 1. $C_j$ is the ordinal value and $N_j$ is the maximum ordinal value of indicator $C_j$.

The value of the index is the average of 12 sub-indices pertaining to the individual policy indicators, each taking a value between 0 and 100.

$$Stringency\ \ Index\ \frac{1}{12}\sum_{j=1}^{12} I_j 0\ \Rightarrow (2)$$

The Stringency Index is validated with the trends in google mobility index - higher the restrictions lower is the human mobility.

**Stringency Index and Mobility Index**




Source: Google Mobility Report and Stringency Index of DEA.

Data is state-wise for June-October. Larger the value of Stringency index stricter are the restrictions.

Note: Google Mobility index is average of the monthly averages of daily values of five variables excluding Residence.

**Figure 20: Higher Initial Stringency was Effective in Controlling Actual COVID-19 Spread and Deaths in States**

**Figure 20a: Cases**

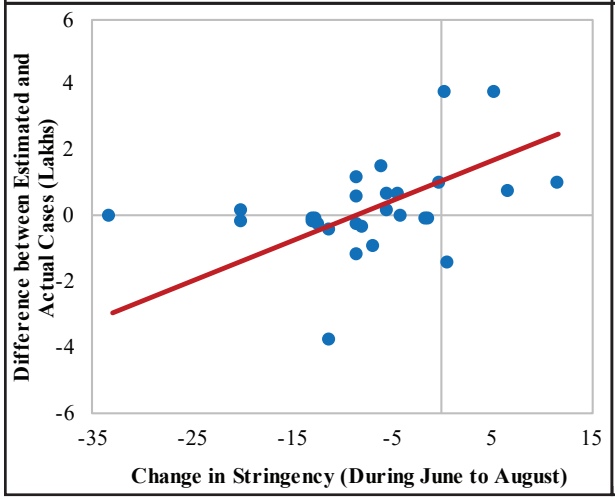
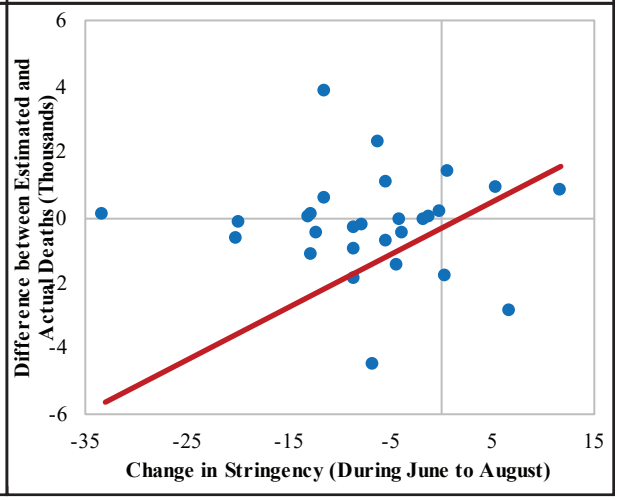



**Figure 20b: Deaths**




Source: Survey calculations

**Box 6: From correlation to causality**

The significant correlation of the difference between expected and actual cases and deaths, and the economic variables with the state level stringency index implies that the stringency of the lockdown had a causal impact on these outcomes.

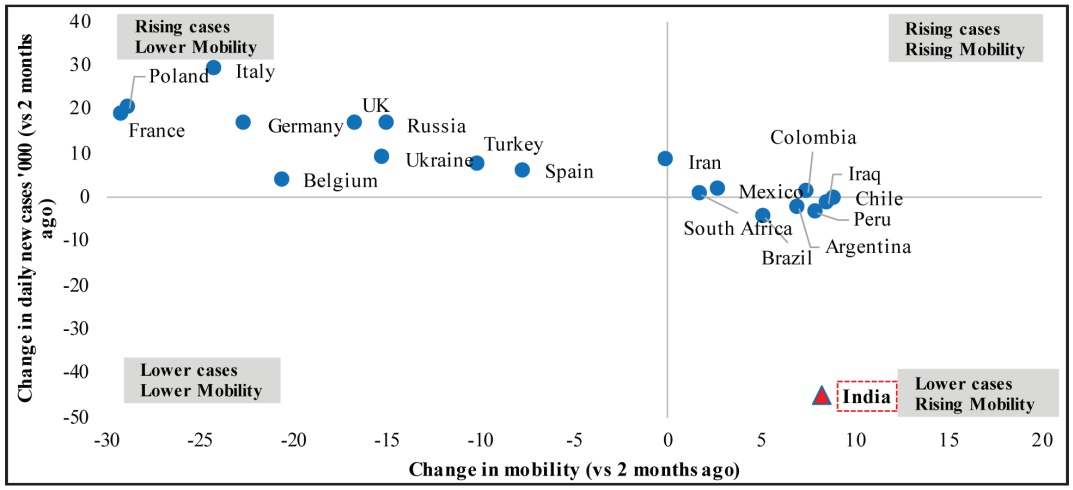
First, any unobserved factor that is peculiar to India - such as higher immunity levels, universal BCG vaccination, or any other socio-economic factor cannot be accounting for the correlations between the deaths and economic variables at the state level with the stringency of the lockdown measured at the state level. This is because these correlations exploit differences across States in the deaths and economic variables, on the one hand, and the differences in the stringency of the lockdown across States. By construction, these differences across states remove the influence of any peculiarity that is specific to India. Therefore, these correlations cannot be due to the influence of some observed or unobserved characteristic that is peculiar to India.

Before interpreting a correlation as a causal relationship, a second concern that econometricians worry about stems from the possible reverse causality, i.e., that the future deaths or economic variables cause the initial lockdown. Of course, this is not possible. A more nuanced concern in this context is that the stringency of the lockdowns at the state level were precisely because of the anticipated difference between actual and estimated cases or deaths. Given the enormous uncertainty that policy makers faced when making the lockdown decisions, such precise expectations during the lockdown is indeed extremely far-fetched. Therefore, the evidence that has been documented indeed shows convincingly that the stringent lockdown saved lives and supported a V-shaped recovery across all the economic indicators.

## INDIA: RIDING AGAINST THE WAVE

1.37 India, in fact, has been an outlier in its experience with COVID-19. It reached its first peak in mid-September, after which rising mobility has been accompanied with lower daily new cases (Figure 21). Globally, many European countries and US have been facing deadly second and third waves around this time with easing of lockdowns and increasing mobility. Most countries had to re-impose intermittent lockdowns while India has been increasingly unlocking. These trends reinforce that India has been effective in combating the COVID-19 pandemic.

**Figure 21a: Rising Mobility and Falling Cases in India**




Source: Data accessed from https://www.Covid19india.org/ and MOHFW - Data as on 31st December, 2020

**Figure 21b: Daily COVID Cases and Mobility**

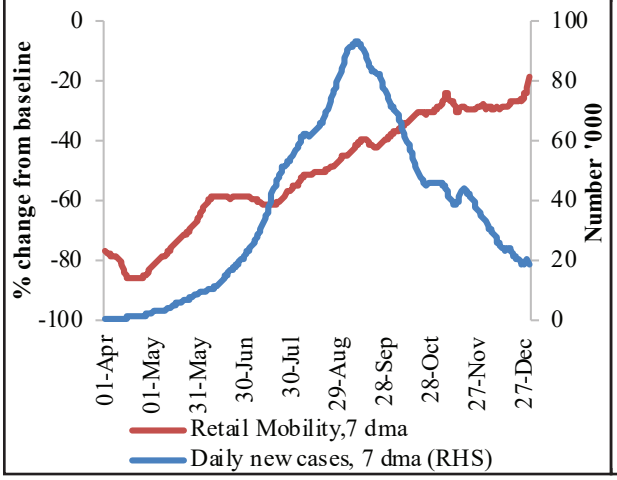
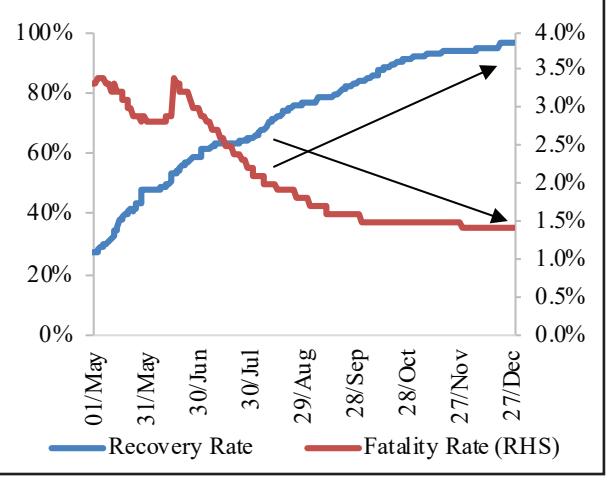



**Figure 21c: Recovery Rate vs Fatality Rate**




Source: Data accessed from https://www.Covid19india.org/ and MOHFW - Data as on 31st December, 2020

1.38 As of January 15, 2020, the spread of the pandemic has been effectively controlled. The number of days to add an additional 10 lakh confirmed cases has been increasing since September, 2020 (Figure 22a). India took 168 days to reach the first 10 lakh cases – largely due to the stringent lockdown in the initial days. The lockdown, in effect, pushed the epidemic curve ahead and gave time to policymakers to build up the testing and health infrastructure to cope up with the increasing caseload once lockdowns were eased – in effect shifting the peak of the pandemic to September. The institutional capacity built during the initial period helped to cope with the peak caseload and sustain the controlled spread after the peak. Among the worst affected countries, India took around 175 days to reach the peak from its first 100 cases while most countries reached their first peak in less than 50 days (Figure 22b). This may have led to overwhelming of their health capacity.

**Figure 22: Shifting of the Peak of the COVID-19 Curve in India**

**Figure 22a: Days to Reach Next 10 lakh Confirmed Cases in India**

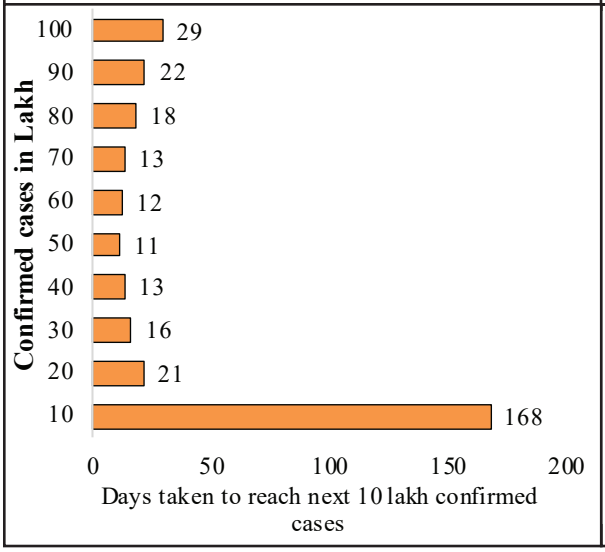
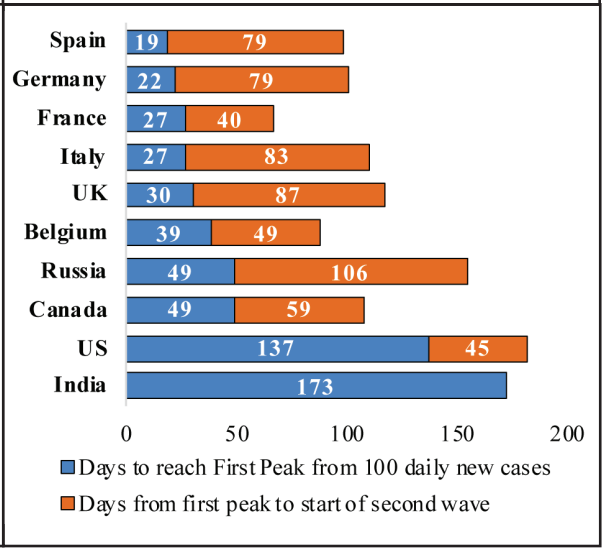


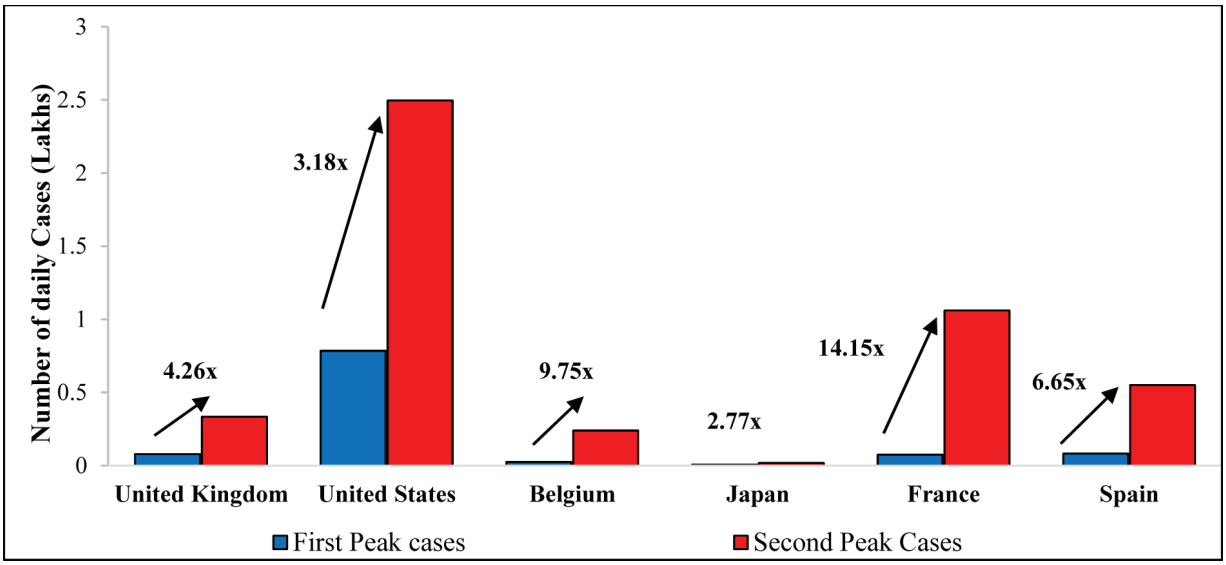

**Figure22b: Peaking Time of COVID-19 in Top Countries**




Source: Data accessed from https://www.Covid19india.org/ and MOHFW - Data as on 31st December, 2020

1.39 Also, most countries experienced their subsequent waves within a period of 2-3 months of crossing their first peak. These second waves have been more lethal in terms of number of cases. (Figure 23). The fatalities in US were 2.9 times higher during second wave. The prospect of India facing a strong second wave is receding with the start of the vaccination this year.

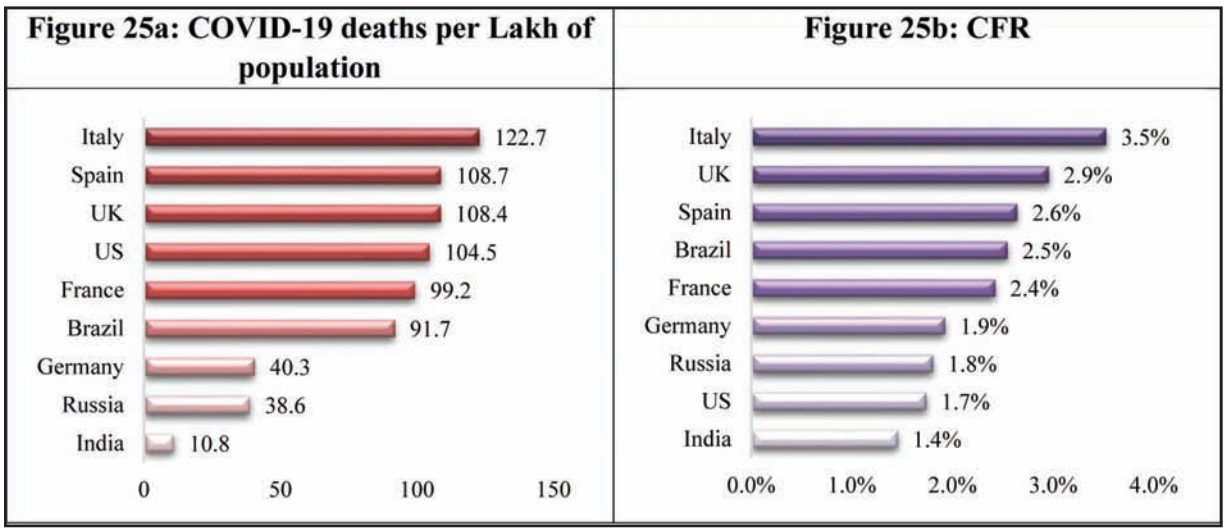
**Figure 23: Second Wave in Countries Has Been More Lethal**




Source: Survey Calculation

1.40 From the peak of 97,900 new cases in a day on September 16, 2020, the COVID-19 curve has flattened with a decline in the number of active cases and new daily cases (Figure 24).

**Figure 25: Comparison of COVID-19 Deaths in Top 10 Worst Affected Countries**



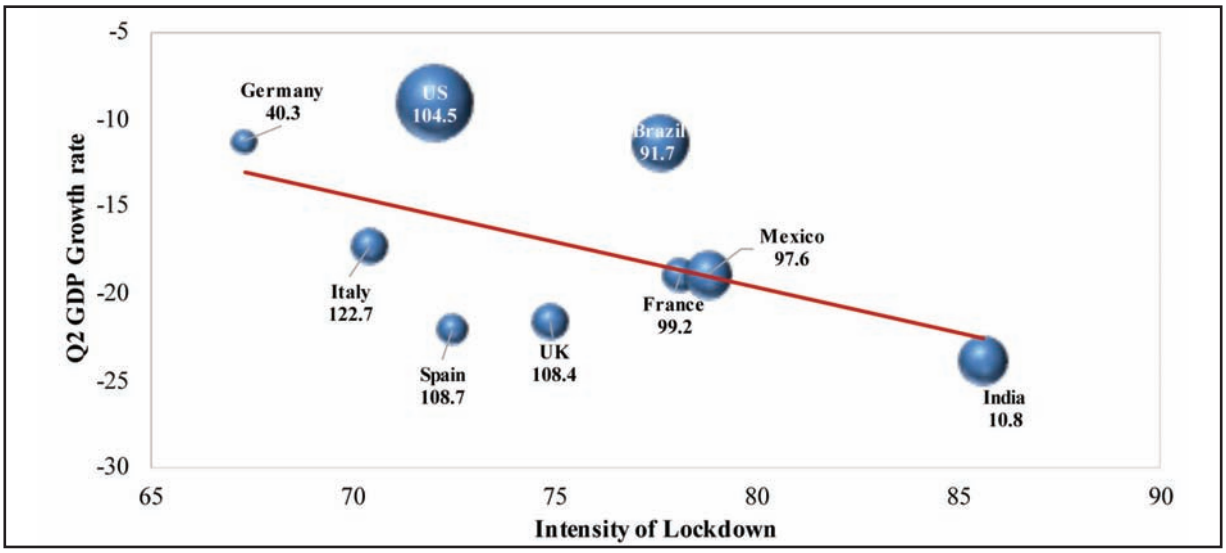

Source: Data accessed from Covid19india.org, MoHFW as on 31st December, 2020

1.41 India's strategy of imposition of a stringent lockdown in the initial stages to control the spread and focus on ramping up testing infrastructure and health facilities are validated by this analysis. The lockdown, therefore, was a critical instrument in "flattening the curve" and saving lives.

## V-SHAPED ECONOMIC RECOVERY DUE TO TIMELY STRINGENT LOCKDOWN

1.42 Evidence from the experience of Spanish flu establishes that cities that intervened with lockdowns earlier and more aggressively experience stronger recovery in economic front in the long run. Learning from this experience, India implemented an early and stringent lockdown from late March to May to curb the pace of spread of COVID-19. With the economy brought to a standstill for two complete months, the inevitable effect was a 23.9 per cent contraction in GDP as compared to previous year's quarter. This contraction was consistent with the stringency of the lockdown (Figure 26).

**Figure 26: Correlation between Stringency and GDP Contraction during Apr-June, 2020**




Source: Compiled from various sources

Note: Bubble size corresponds to number of deaths as on 31st December, 2020; number of deaths per lakh indicated with the bubble

1.43 The economy was gradually unlocked since June, 2020 and has experienced a V-shaped recovery since then. An attempt has been made to capture the impact of the stringency of lockdown on high-frequency indicators of economic activity States across India. The contemporaneous as well as lagged impact of change in stringency of lockdown across States on month-on-month growth of varied economic indicators from time period since unlock begins i.e., from June to October has been studied (Box 7). The state-wide Stringency Index as detailed in Box 4 has been used for the analysis. It may be noted that April and May had similar stringency across States as mandated by Central Government.

### Box 7: Using First-Differences to Avoid Spurious Correlations

Time series data on various economic indicators commonly exhibit a trend effect i.e., to grow over time

Example: $y_t = \alpha_0 + \alpha_1 * t + e_t$, $t = 1, 2, \ldots$ where $e_t$ represents errors that are i.i.d., independent and identically distributed.

In this case, it can be seen that $\Delta y = y_t - y_{t-1} = \alpha_1$ Thus, the first difference of $y_t$ does not have a time-trend incorporated into it.

Granger and Newbold (1974) argued that the "levels" of many economic time-series are integrated or nearly so. As a result, if such data are used in a regression model a high R2 value

is likely to be found even when the time-series for the two variables are independent of each other, thus leading to spurious estimates of the correlation between the two variables. They also illustrated that the regression residuals are likely to be autocorrelated, as evidenced by a very low value for the Durbin-Watson (DW) statistic.

Granger and Newbold (1974) present strong evidence that regressions involving random walks are spurious when performed on the levels, but not on the differences. Therefore, instead of levels, using first difference i.e., $\Delta y_t = y_t - y_{t-1}$ avoids the problem of spurious correlations.

1.44 Table 1 shows the negative relationship between the month-on-month change in economic indicators with the month-on-month change in stringency index, thereby corroborating that the lockdown negatively impacted economic activity contemporaneously.

**Table 1: Contemporaneous Impact of Stringency Index on Economic Indicators**

| Dependent Variable (MoM Change) | Electronic toll (ETC) collection | Electronic toll (ETC) Count | Number of E-Way Bills | Value of E-way Bills |
|---|---|---|---|---|
| Stringency Index (MoM Change) | -0.528*** | -0.703*** | -0.239 | -0.203* |
| | (0.135) | (0.156) | (0.158) | (0.121) |
| Constant | 0.0760*** | 0.0875*** | 0.123*** | 0.104*** |
| | (0.0258) | (0.0298) | (0.0306) | (0.0233) |
| $R^2$ | 0.123 | 0.158 | 0.015 | 0.019 |

Source: Survey Calculation
Note: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

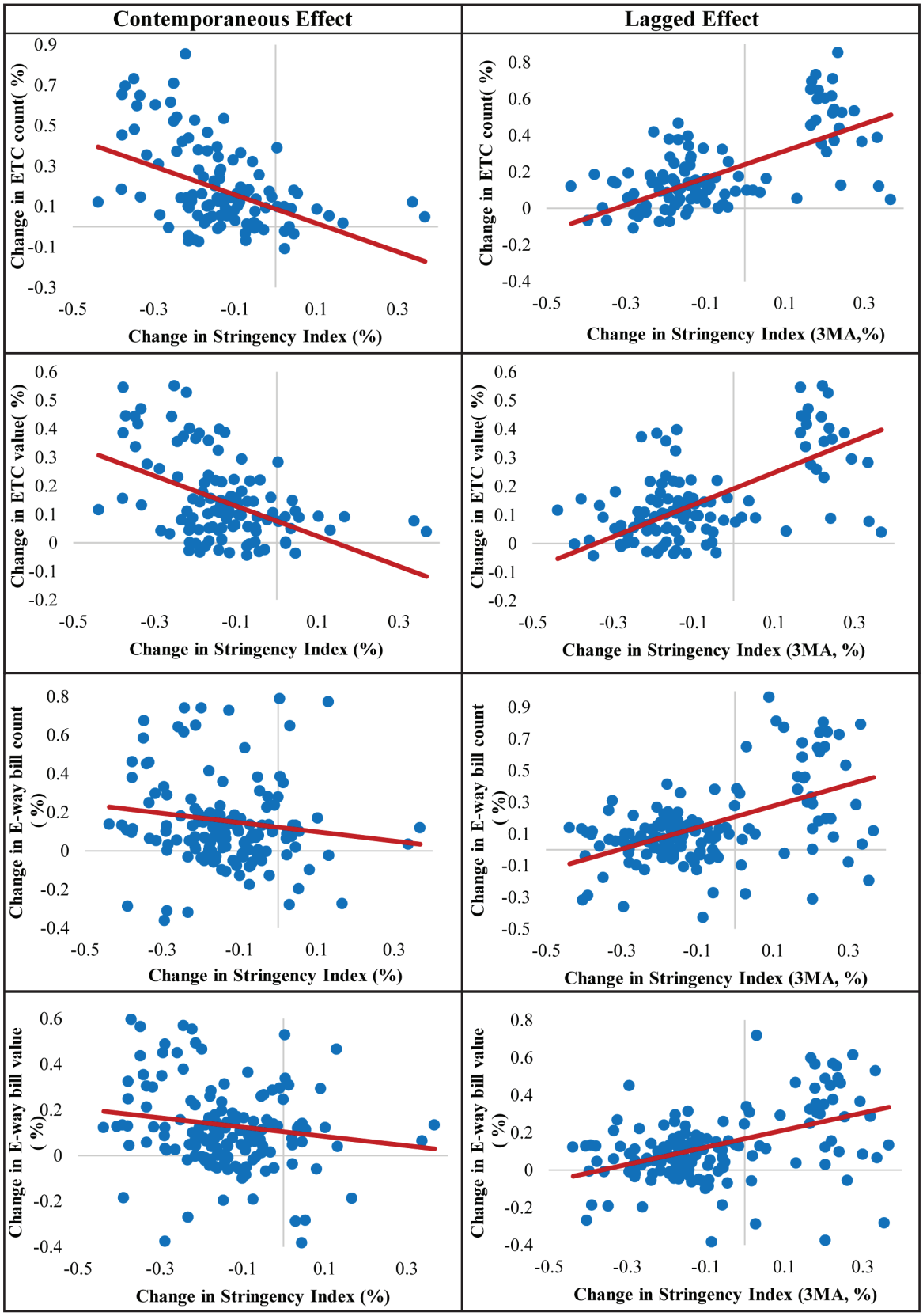
1.45 To capture the lagged impact of stringency on economic indicators, a three-month moving average of stringency index has been used. The Survey see that the month-on-month change in the three-month moving average of the stringency index has a positive relationship with the growth in each of the economic indicators (Table 2). Thus, the initial stringent lockdown has supported a V-shaped recovery across all the economic indicators (Figure 27 and 28).

**Table 2: Impact of 3-Month Moving Average of Stringency Index on Economic Indicators**

| Dependent Variable (MoM Change) | ETC collection | ETC Count | Number of E-Way Bills | Value of E-way Bills |
|---|---|---|---|---|
| 3_MA_Stringency Index (MoM Change) | 0.560*** | 0.739*** | 0.678*** | 0.458*** |
| | (0.0877) | (0.0981) | (0.0970) | (0.0766) |
| Constant | 0.191*** | 0.240*** | 0.207*** | 0.167*** |
| | (0.0179) | (0.0200) | (0.0206) | (0.0163) |
| $R^2$ | 0.274 | 0.345 | 0.248 | 0.194 |

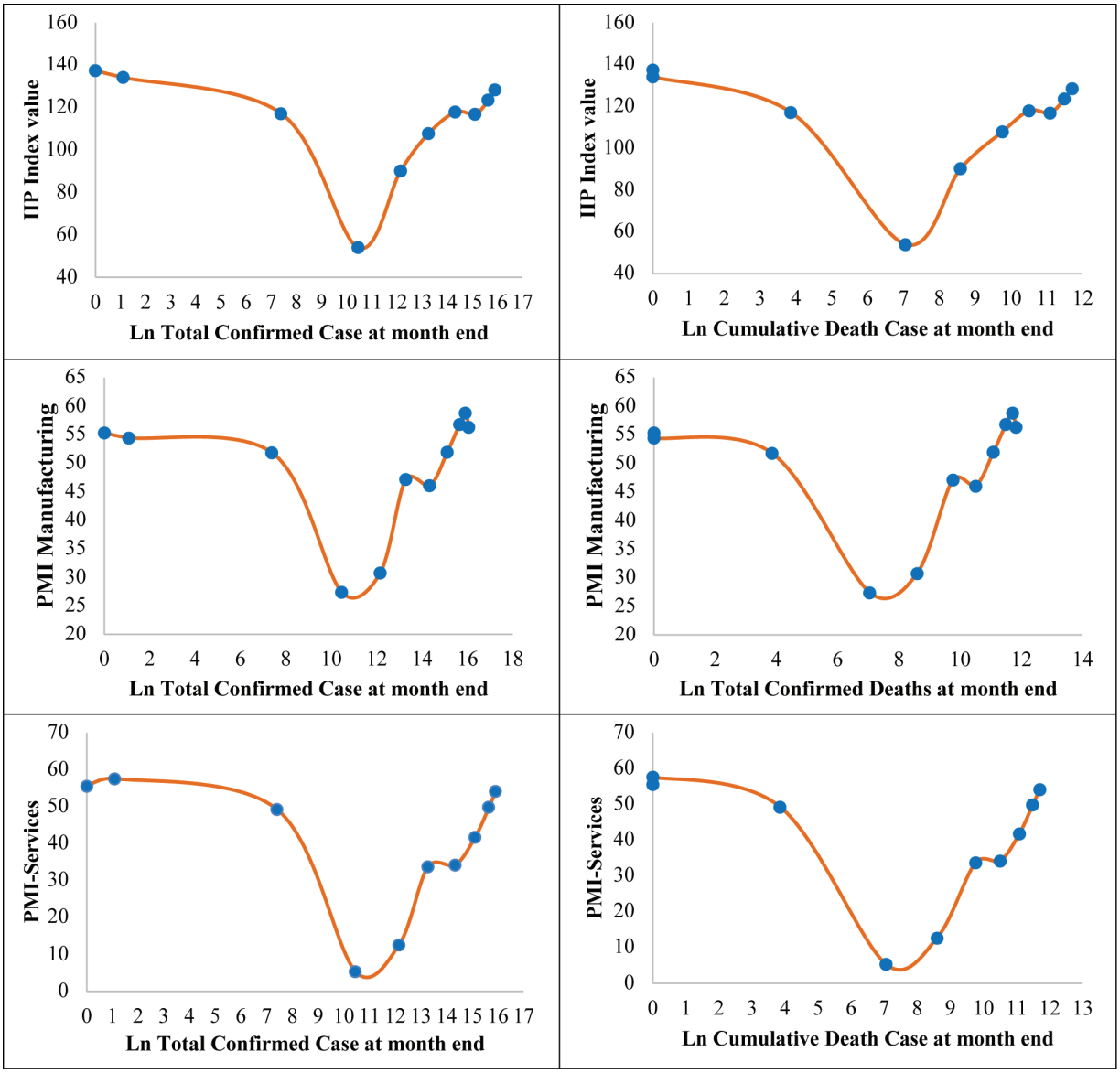
Source: Survey Calculation
Note: Standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

**Figure 27: V-shaped Economic Recovery: Contemporaneously Negative and Lagged Positive Impact of Initial Stringency**




Source: Survey Calculation

**Figure 28: V-shaped Economic Recovery**




Source: Data accessed from https://www.Covid19india.org/, MoHFW, MoSPI, BSE, IHS Markit

## FAR-SIGHTED POLICY RESPONSE FOR ECONOMIC RECOVERY

1.46 The public health response needed to slow transmission of COVID-19, together with need for social distancing and minimizing contact, has meant that service sectors reliant on face-to-face interactions—particularly wholesale and retail trade, hospitality, and arts and entertainment—have seen larger contractions than manufacturing. These service sectors, in most economies, contribute a significant portion to both incomes and employment. The scale of disruption in these sectors has, therefore, had a severe impact on the livelihoods of sections engaged in these sectors.

1.47 The pandemic induced lockdowns led to local, regional, and global supply disruptions hitting economic activity – rendering a 'first order' supply shock. This, in turn, has led to

a demand shock both through disruptions in the labour market, which affect household income, and through the precautionary motive to save, which stemmed from the uncertainty amidst the health crisis. In a normal economic crisis, policy support is rendered to stimulate aggregate demand as quickly as possible. However, the containment measures required to limit the spread of the pandemic, which constrained economic activity, reduced the efficacy of demand-side measures during the lockdown.

1.48 The unprecedented nature of the COVID-19 shock, the associated uncertainty about the length and severity of the pandemic, and the widespread prevalence of lockdowns which restrict in-person shopping made it ex-ante unclear how individuals would use direct cash transfers. An analysis of stimulus payments in US documented that only 15 per cent of recipients of this transfer spent their transfer payment, while 33 per cent saved it and 52 per cent used it to pay down debt (Coibion et al., 2020). Most of the spending was on essential items like food and other non-durable consumer products. This was largely due to the restrictions placed by the pandemic-induced lockdown with curtailed options for discretionary spending. The uncertainty of the duration of the pandemic with associated job loss or reduced incomes induced precautionary savings in the anticipation that these funds will be needed to make it through a long period of low income or for health urgencies. Carroll, et.al, 2020 showed that in the face of a prolonged and severe crises, government may want to consider a broad range of policies targeting aggregate demand, with direct transfers being only a part of the fiscal policy response.

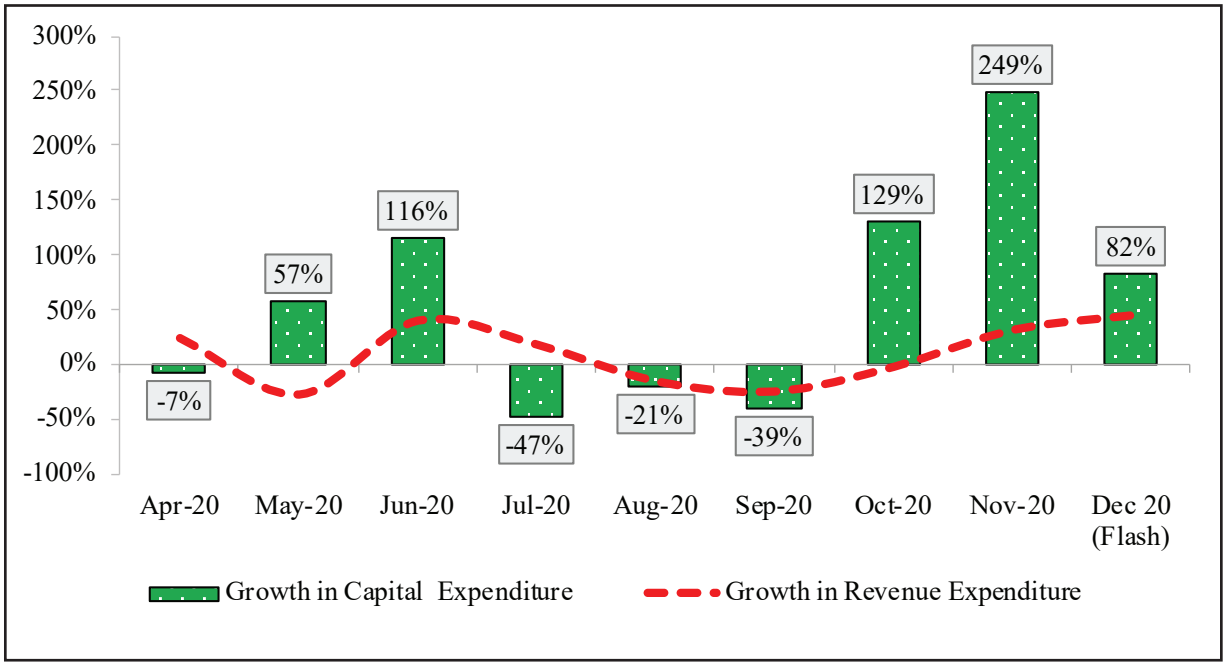
1.49 Indian policymakers, backed by evidence, recognized that the lockdown would adversely impact economic activity and disrupt livelihoods. The fiscal policy response of the Government of India to the pandemic was, accordingly, strategized with a step-by-step approach. During the first two quarters of FY:2020-21, the Government ensured that funds for essential activities were available despite a sharp contraction in revenue receipts. The initial approach was to provide a cushion for the poor and section of society and to the business sector (especially the MSMEs) to tide over the distress caused by disruption of economic activity. The Pradhan Mantri Garib Kalyan Yojana (PMGKY) for ensuring food security through public distribution system, direct benefit transfers to widows, pensioners and women, additional funds for MGNREGS, and debt moratoria and liquidity support for businesses (Table 3). With the easing of movement and health-related restrictions in the third quarter, the the government transited in a calibrated fashion to support investment and consumption demand through Atmanirbhar 2.0 and 3.0. The timing of stimulus was tuned to the absorptive capacity of the economy, which was affected by the lockdown. There was no point in pushing the accelerator while the foot was firmly on the brake as a demand stimulus at a time when supply was constrained would have not helped. The timing of the expenditure push, especially the capital expenditure, after the reduction in health-related curbs, manifests the strategy of stimulating 'growth' when it would be most effective (Figure 29). As we have seen above, the economic recovery gained momentum since the first quarter.

**Table 3: Pradhan Mantri Garib Kalyan Package – Total Direct Benefit Transfers**

| Scheme | Number of Beneficiaries (Crore) | Amount (₹ Crore) |
|---|---|---|
| **Support to PMJDY women account holders** | 1st Ins – 20.65<br>2nd Ins – 20.63<br>3rd Ins – 20.62 | 10,325<br>10,315<br>10,312 |
| **Support to NSAP (Aged widows, Divyang, Senior citizen)** | 2.81 | 2814 |
| **Front-loaded payments to farmers under PM-KISAN** | 8.94 | 17891 |
| **Support to Building & Other Construction workers** | 1.82 | 4987 |
| **24 per cent contribution to EPFO** | .45 | 2570 |
| **Pradhan Mantri Ujjwala Yojana** | 1st Ins – 7.43<br>2nd Ins – 4.43<br>3rd Ins – 1.82 | 9700 |
| **TOTAL** | **42.1** | **68914** |

Source: PIB
Note: Progress as on 31st December 2020, Ins means Instalment.

**Figure 29: Trend in Growth of Monthly Expenditure of Central Government during FY 2020-21 (YoY)**

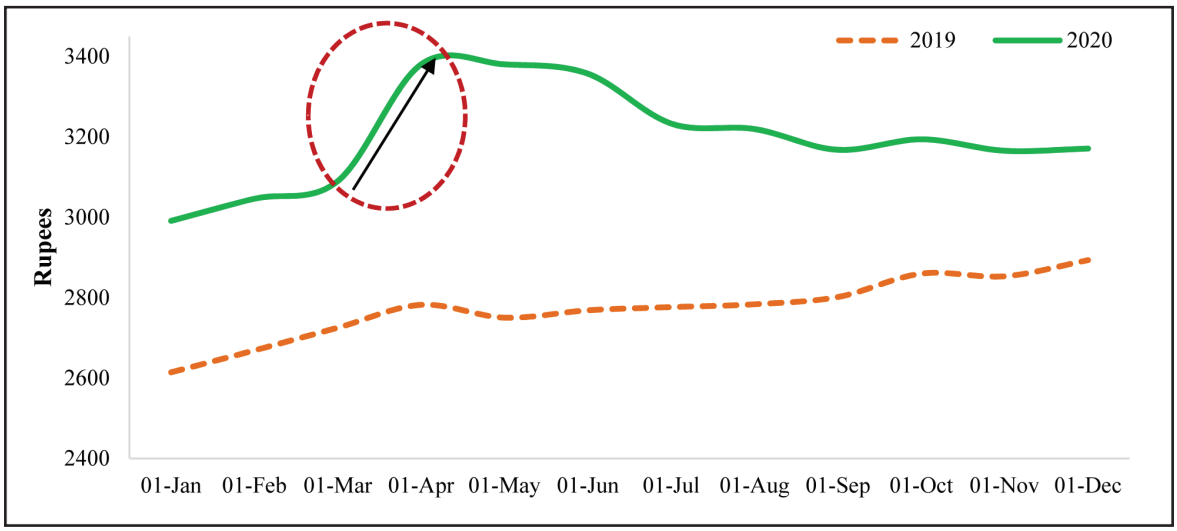



Source: Department of Expenditure

1.50 The calibrated stance of the Government is corroborated by the trend in average balances in Pradhan Mantri Jan-Dhan Yojana (PMJDY) accounts. Figure 30 shows that the average balance in these accounts increased during the April-June quarter – indicative of the precautionary savings by the accountholders. However, as the economy revived, the balances have shown a

fall pointing towards increasing expenditures on consumption.

**Figure 30: Trends in Monthly Average Balances in PMJDY Accounts**




Source: pmjdy.gov.in

## Structural Reforms

1.51 The Indian policymakers also recognized that the 'supply' shock induced by the lockdown would disrupt the productive capacity of the economy. This capacity would need to be strengthened to meet the pent-up demand once it resumes – any mismatch would lead to macro-economic instabilities. This was, in effect, an 'underheating' of the economy with lack of demand, disruption of supply chains and anticipated large scale corporate distress. A simple reflating of the economy through increased government expenditure would, under these circumstances, have led to runaway inflation especially given the inherent supply-side constraints in India's food economy. Therefore, India initiated a slew of multi-sectoral supply-side structural reforms to lend flexibility and resilience to supply chains as a part of the Atmanirbhar Bharat Mission (ANB) (Table 4). India is the only country to have undertaken structural reforms on the supply-side at the initial stages of the pandemic. This far-sighted policy response will generate productivity gains in the medium to long term.

1.52 These reforms primarily focus on strengthening the potential of primary and secondary sectors of the economy to create jobs. The primary sector in India (agriculture and mining sectors) contributes around 16 per cent of Gross Value Added (GVA) while it employs around 43 per cent of the workforce (as per PLFS, 2018-19). This indicates the huge potential to provide gainful employment opportunities for people employed in these sectors. The secondary sector provides expanded opportunities for formal employment with enhanced incomes, income stability and social security provisions.

**Table 4: Major Structural Reforms Undertaken as a Part of Atmanirbhar Bharat Package**

| Sector | Structural Reform Undertaken |
|---|---|
| | **Deregulation and Liberalization of Sectors** |
| Agriculture | • Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020<br>• Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Act, 2020<br>• Essential Commodities (Amendment) Act, 2020 |

| | |
|---|---|
| MSMEs | • New MSME definition covering almost 99 per cent of all firms enabling MSMEs to grow in size and create jobs<br>• Removal of artificial separation between manufacturing and service MSMEs |
| Labour | • Enactment of four labour codes namely, Wage Code, Industrial Relations Code, 2020, Code on Occupational Safety, Health & Working Conditions Code, 2020 & Social Security Code, 2020<br>• 'One labour return, one licence and one registration' |
| Business Process Outsourcing (BPO) | • Simplification of the Other Service Provider (OSP) guidelines of the Department of Telecom. Several requirements, which prevented companies from adopting 'Work from Home' and 'Work from Anywhere' policies have been removed |
| Power | • Tariff Policy Reform: DISCOM inefficiencies not to burden consumers, Progressive reduction in cross subsidies, Time bound grant of open access, etc.<br>• Privatization of Distribution in UTs |
| PSUs | • PSUs in only strategic sectors<br>• Privatization of PSUs in non-strategic sectors |
| Mineral Sector | • Commercial Mining in Coal Sector<br>• Removal of distinction between captive and merchant mines<br>• Transparent auction of mining blocks<br>• Amendment to Stamp Act, 1899 to bring uniformity in stamp duty across States<br>• Introduction of a seamless composite exploration-cum-mining-cum-production regime |
| **Strengthening Productive Capacity** | |
| Industry | • Production Linked Incentive (PLI) Scheme for 10 identified sectors<br>• National GIS-enabled Land Bank system launched |
| Space | • Level playing field provided to private companies in satellites, launches and space-based services<br>• Liberal geo-spatial data policy for providing remote-sensing data to tech-entrepreneurs |
| Defence | • Corporatization of Ordnance Factory Board<br>• FDI limit in the Defence manufacturing under automatic route to be raised from 49 per cent to 74 per cent.<br>• Time-bound defence procurement process |
| **Strengthening Productive Capacity** | |
| Education | • PM-eVidya to enable multi-mode and equitable access to education<br>• Manodarpan initiative for psychosocial support |
| Social Infrastructure | • Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure Viability Gap Funding (VGF) Scheme extended till 2024-25 |
| **Ease of Doing Business** | |
| Financial Markets | • Direct listing of securities by Indian public companies in permissible foreign jurisdictions<br>• Provisions to reduce time line for completion of rights issues by companies<br>• Private companies which list NCDs on stock exchanges not to be regarded as listed companies |

| | |
|---|---|
| Corporates | • Including the provisions of Part IXA (Producer Companies) of Companies Act, 1956 in Companies Act, 2013<br>• Decriminalization of Companies Act defaults involving minor technical and procedural defaults<br>• Power to create additional/ specialized benches for NCLAT<br>• Lower penalties for all defaults for Small Companies, One-person Companies, Producer Companies & Start Ups<br>• Simplified Proforma for Incorporating Company Electronically Plus (SPICe +) introduced |
| Administration | • National platform for recruitment: National Recruitment Agency to conduct a Common Eligibility Test<br>• Revised guidelines on Compulsory retirement to remove ineffective or corrupt officials through Fundamental Rule 56(j)/(l) and Rule 48 of CCS (Pension) Rule<br>• Faceless tax assessment and a 12-point taxpayers charter<br>• Fast track Investment Clearance through Empowered Group of Secretaries |

Source: Compiled from various sources. The list presents the major structural reforms.

1.53 Major structural reforms launched by the Government – in agriculture markets, labour laws and definition of MSMEs – provide unparalleled opportunity to grow and prosper now and thereby contribute to job creation in the primary and secondary sectors. The modified definition of MSMEs facilitates expansion and growth of these enterprises without them fearing the loss of government incentives, thereby avoiding the phenomenon of dwarfs among MSMEs. The resulting economies of scale can enhance productivity without the MSMEs losing out on several government incentives including interest subvention, collateral-free loans, market support, export promotion, preferential procurement in the public sector and enabling of IT ecosystems.

1.54 The historic labour reforms – discussed for three decades after the conditionality in the 1991 loan from IMF but never implemented thus far – will benefit MSMEs to increase employment, enhance labour productivity and thereby wages in MSMEs. The use of full-time equivalents provides flexibility to MSMEs to tailor their labour strength to market conditions and thereby enhance employment. The increase in the size thresholds from 10 to 20 employees to be called a factory, 20 to 50 for contract worker laws to apply, and 100 to 300 for standing orders enable economies of scale and unleash growth. The drastic reductions in compliance stem from (i) 41 central labour laws being reduced to four, (ii) the number of sections falling by 60 per cent from about 1200 to 480, (iii) the maze due to the number of minimum wages being reducing from about 2000 to 40, (iv) one registration instead of six, (v) one license instead of four, and (vi) de-criminalisation of several offences. These reforms balance the interest of both workers and employers. These codes provide social security, protection, safe and working environment and effective conciliation dispute mechanism to workers.

1.55 The reforms in the agricultural sector were more overdue than even the labour reforms as the existing laws kept the Indian farmer enslaved to the local Mandi and their rent-seeking intermediaries. While every other category of producer in India had the freedom to decide

where to sell his/her produce, the Indian farmer did not. The local monopolists created by this legal infrastructure enabled the intermediaries to prosper at the cost of the farmer, especially the poor ones without the wherewithal to store their produce. The agricultural reforms enable the farmer to sell where he gets the best deal and thereby enable competition that is sine qua non to create welfare for the small farmer. The reforms in agriculture markets will enable creation of 'One India one market' for agri-products, create innumerable opportunities for farmers to move up the value chain in food processing - from farm to fork, create jobs and increase incomes.

1.56 The proposed structural reforms in the mining sector aim to increase participation of the private sector in mineral exploration, redefine the norms of exploration for auction of mineral blocks to ensure a seamless exploration-cum-mining-cum-production regime. They will also redefine the standard of exploration required for auctioning of blocks for prospecting license-cum mining lease and open acreage licensing policy for allocation of mining rights which will give a major boost to the production of minerals in the country. These reforms aim to reduce dependence on imported coal, to create a strong, self-reliant domestic energy sector, attract private investments, generate jobs and stimulate the economic growth in the medium-term.

1.57 At the same time, production-linked incentive (PLI) schemes have been implemented in ten key specific sectors to make Indian manufacturers globally competitive, attract investment in the areas of core competency and cutting-edge technology; ensure efficiencies; create economies of scale; enhance exports and make India an integral part of the global supply chain. These Schemes provide incentive to enhance production and create wealth and jobs. The proposed privatization of Public Sector Enterprises in non-strategic sectors recognizes the need for efficient allocation and use of resources. All these reforms are intended to bolster the productive capacity of the economy, and create wealth and jobs especially at the bottom of the pyramid. This would, in turn, lead to inclusive growth and sustained demand generation in the economy. The policy package ensures that the regulatory environment is conducive to ease of doing business with simpler, transparent and time-bound procedures for doing business.

1.58 Most of these reforms have long been recommended for enhancing the efficiency and achieving economies of scale in various sectors. An illustrative timeline of the consultations for agricultural reforms may be seen at Table 4. Specifically, economic surveys of previous years have made the case for these reforms by highlighting carefully the economic benefits from the same. The time of the 'crisis' was utilized to take some 'bold' decisions to actually implement these reforms to propel the growth of the Indian economy.

**Table 4: Illustrative Timeline of Consultations/Recommendations for Agricultural Reforms**

| S. No. | Committee/Report | Year | Chairperson/Author |
|---|---|---|---|
| 1 | Expert Committee on Strengthening and Developing of Agricultural Marketing | 2001 | Shankerlal Guru |
| 2 | Report on the Task Force on Employment Opportunities | 2001 | Montek Singh Ahluwalia |

| | | | |
|---|---|---|---|
| 3 | Inter-Ministerial Task Force | 2001 | R.C.A. Jain |
| 4 | Model APMC Act created | 2003 | |
| 5 | First Report of National Commission on Farmers | 2004 | M.S. Swaminathan |
| 6 | Second Report of National Commission on Farmers | 2005 | M.S. Swaminathan |
| 7 | Towards an Indian Common Market: Removal of Restrictions on Internal Trade in Agriculture Commodities, the Food and Agriculture Organisation of the United Nations | 2005 | |
| 8 | Third Report of National Commission on Farmers | 2005 | M.S. Swaminathan |
| 9 | Fourth Report of National Commission on Farmers | 2006 | M.S. Swaminathan |
| 10 | Fifth Report of National Commission on Farmers-Volume I & II | 2006 | M.S. Swaminathan |
| 12 | Draft State Agricultural Produce Marketing (Development and Regulation) Rules, 2007 | 2007 | |
| 13 | Economic Survey 2011-12, Chapter 8: Agriculture and Food | 2012 | Chief Economic Adviser (CEA): Dr. Kaushik Basu |
| 14 | Final Report of Committee of State Ministers, In-charge of Agriculture Marketing to Promote Reforms | 2013 | Harshvardhan Patil |
| 15 | Economic Survey: 2012-13, Chapter 8: Agriculture and Food Management | 2013 | CEA: Dr. Raghuram G. Rajan |
| 16 | Economic Survey 2013-14, Chapter 8: Agriculture and Food Management | 2014 | Finance Secretary: Dr. Arvind Mayaram |
| 17 | Economic Survey 2014-15, Volume I, Chapter 8: A National Market for Agricultural Commodities – Some Issues and the Way Forward | 2015 | CEA: Dr. Arvind Subramanian |
| 18 | Economic Survey 2014-15, Volume II, Chapter 5: Prices, Agriculture and Food Management | 2015 | CEA: Dr. Arvind Subramanian |
| 19 | Budget 2017-2018- Market reforms to be undertaken and the States to be urged to denotify perishables from APMC | 2017 | Finance Minister: Arun Jaitley |
| 20 | Economic Survey 2016-17, Volume II, Chapter 7: Agriculture and Food Management | 2017 | CEA: Dr. Arvind Subramanian |
| 21 | Standing Committee On Agriculture (2018-2019), Ministry Of Agriculture And Farmers Welfare (Department Of Agricultural, Cooperation And Farmers Welfare): Agriculture Marketing And Role Of Weekly Gramin Haats | 2019 | Hukmdev Narayan Yadav |
| 22 | Economic Survey 2019-20, Volume I, Chapter 4: Undermining Markets | 2020 | CEA: Dr. K. V. Subramanian |
| 22 | Parliament enacts three laws that usher in agricultural reforms | 2020 | |

Source: Compiled from various sources and is indicative.

## LOOKING FORWARD

1.59 The V-shaped economic recovery while avoiding a second wave of infections make India a sui generis case in this unique, synchronized global recession. Despite the hard-hitting economic shock created by the global pandemic, India is witnessing a V-shaped recovery with a stable macroeconomic situation aided by a stable currency, comfortable current account, burgeoning forex reserves, and encouraging signs in the manufacturing sector output. India is reaping the "lockdown dividend" from the brave, preventive measures adopted at the onset of the pandemic, which were based on the humane principle advocated eloquently in the Mahabharata that "Saving a life that is in jeopardy is the origin of dharma." The policy maturity and the alacrity displayed to not "waste a crisis" has helped the country to save both 'lives' and 'livelihoods' in its own unique way and has shifted the focus away from the short-term pain created by the crisis to the potential for long-term gains engendered by the policy response.

### CHAPTER AT A GLANCE

- The COVID-19 pandemic engendered a once-in-a-century global crisis in 2020. Faced with unprecedented uncertainty at the onset of the pandemic, India focused on saving lives and livelihoods by its willingness to take short-term pain for long-term gain.
- India's response stemmed from the humane principle that while GDP growth will recover from the temporary shock caused by an intense lockdown, human lives that are lost cannot be brought back.
- The response drew on epidemiological and economic research, especially those pertaining to the Spanish Flu, which highlighted that an early, intense lockdown provided a win-win strategy to save lives, and preserve livelihoods via economic recovery in the medium to long-term. This strategy was also tailored to India's unique vulnerabilities to the pandemic.
- The strategy was also motivated by the Nobel-Prize winning research in Hansen & Sargent (2001) that recommends a policy focused on minimizing losses in a worst case scenario when uncertainty is very high. Faced with an unprecedented pandemic and the resultant uncertainty, loss of scores of human lives captured thus the worst case scenario.
- India's strategy flattened the curve, pushed the peak to September, 2020, and helped transform the short-term trade-off between lives and livelihoods into a win-win in the medium to long-term that saves both lives and livelihoods. After the September peak, India has been unique in experiencing declining daily cases despite increasing mobility.
- While the lockdown resulted in a 23.9 per cent contraction in GDP in Q1, the recovery has been a V-shaped one as seen in the 7.5 per cent decline in Q2 and the recovery across all key economic indicators.
- Unlike previous crises, the COVID pandemic affects both demand and supply. India was the only country to announce a slew of structural reforms to expand supply in the medium to long term and avoid long-term damage to productive capacities.

- On the demand side, India's policies have been calibrated to ensure that the accelerator is slowly pushed down only when while the brakes are being removed on economic activities. A public investment programme centred around the National Infrastructure Pipeline is likely to accelerate the demand push and further the recovery.
- The upturn in the economy while avoiding a second wave of infections makes India a sui generis case in strategic policymaking amidst a once-in-a-century pandemic.

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# Does Growth Lead to Debt Sustainability? Yes, But Not Vice-Versa!

**02**
**CHAPTER**

*प्रजानामेव भूत्यर्थं स ताभ्यो बलिमग्रहीत्।*
*सहस्रगुणमुत्स्रष्टुमादत्ते हि रसं रविः।। १-१८।।*

***"The state collects tax for the greater welfare of its citizens in the same way as the sun evaporates water, only to return it manifold in the form of rain." (Chapter 1, Shloka 18)***

***— Mahakavi Kalidasa's Raghuvansham***

*Does growth lead to debt sustainability? Or, does fiscal austerity foster growth? Given the need for fiscal spending amidst the COVID-19 crisis, these questions assume significance. This Chapter establishes clearly that growth leads to debt sustainability in the Indian context but not necessarily vice-versa. This is because the interest rate on debt paid by the Indian government has been less than India's growth rate by norm, not by exception. As Blanchard (2019) explains in his 2019 Presidential Address to the American Economic Association: "If the interest rate paid by the government is less than the growth rate, then the intertemporal budget constraint facing the government no longer binds." This phenomenon highlights that debt sustainability depends on the "interest rate growth rate differential" (IRGD), i.e. the difference between the interest rate and the growth rate in an economy.*

*In advanced economies, the extremely low interest rates, which have led to negative IRGD, on the one hand, and have placed limitations on monetary policy, on the other hand, have caused a rethink of the role of fiscal policy. The same phenomenon of a negative IRGD in India – not due to lower interest rates but much higher growth rates – must prompt a debate on the saliency of fiscal policy, especially during growth slowdowns and economic crises.*

*The confusion about causality – from growth to debt sustainability or vice-versa – is typical of several macro-economic phenomena, where natural experiments to identify causality are uncommon. In the specific context of growth and debt sustainability, this confusion also stems from the fact that the academic and policy literature focuses primarily on advanced economies, where causality is entangled by lower potential growth when compared to India. Indeed, the chapter studies the evidence across several countries to show that growth causes debt to become sustainable in countries with higher growth rates; such clarity about the causal direction is not witnessed in countries with lower growth rates. By integrating ideas from Corporate Finance into the macro-economics of Government debt a la Bolton (2016), the Survey lays the conceptual foundations to understand why these differences can manifest between high-growth emerging economies and low-growth advanced economies.*

*As the COVID-19 pandemic has created a significant negative shock to demand, active fiscal policy – one that recognises that fiscal multipliers are disproportionately*

*higher during economic crises than during economic booms – can ensure that the full benefit of seminal economic reforms is reaped by limiting potential damage to productive capacity. As the IRGD is expected to be negative in the foreseeable future, a fiscal policy that provides an impetus to growth will lead to lower, not higher, debt-to-GDP ratios. In fact, simulations undertaken till 2030 highlight that given India's growth potential, debt sustainability is unlikely to be a problem even in the worst scenarios. The chapter thus demonstrates the desirability of using counter-cyclical fiscal policy to enable growth during economic downturns.*

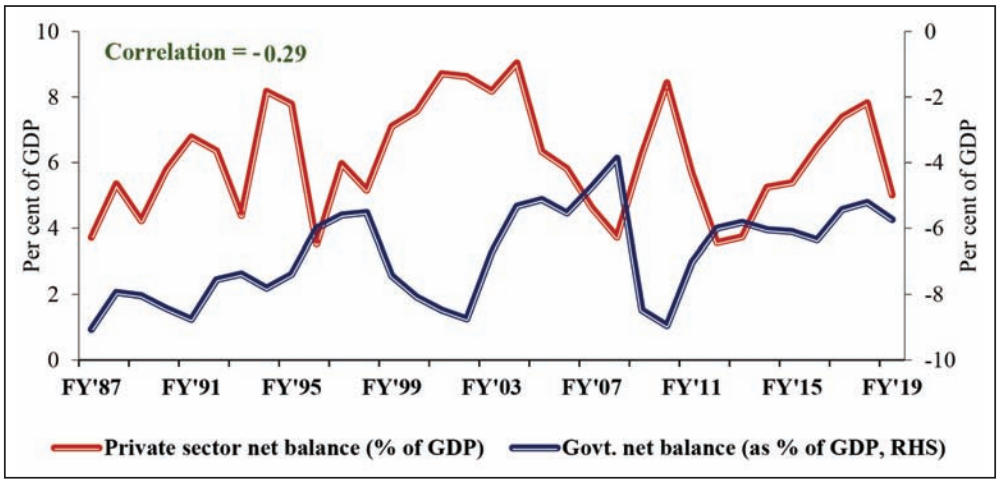
*While acknowledging the counterargument from critics that governments may have a natural proclivity to spend, the Survey endeavours to provide the intellectual anchor for the government to be more relaxed about debt and fiscal spending during a growth slowdown or an economic crisis. The Survey's call for more active, counter-cyclical fiscal policy is not a call for fiscal irresponsibility. It is a call to break the intellectual anchoring that has created an asymmetric bias against fiscal policy.*

2.1 Amidst the COVID-19 crisis, fiscal policy has assumed enormous significance across the world. Naturally, the debate around higher Government debt to support a fiscal expansion is accompanied by concerns about its implications for future growth, debt sustainability, sovereign ratings, and possible vulnerabilities on the external sector. This chapter examines the optimal stance of fiscal policy in India during a crisis and establishes that the growth leads to debt sustainability in the Indian context and not necessarily vice-versa.

2.2 While fiscal policy is especially salient during an economic crisis, in general, fiscal policy must be counter-cyclical to smooth out economic cycles instead of exacerbating them. As seen for the United States and United Kingdom, the correlation between private sector and public sector net balances is almost perfectly negative (-0.9) (Figure 1b and 1c). In India, however, fiscal policy has not been counter-cyclical in general (Figure 1a).

**Figure 1: Trends in Government and Private sector balances**

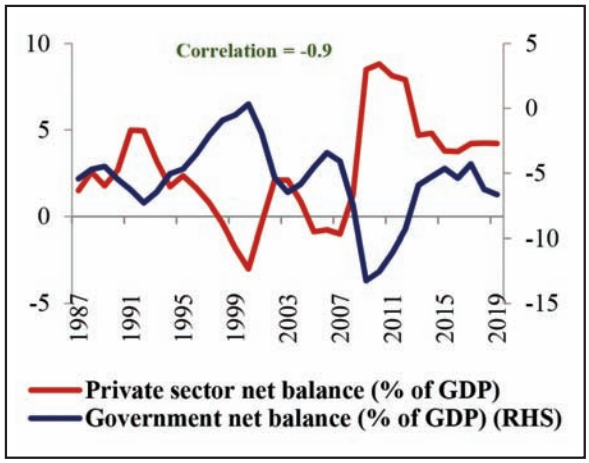
**Figure 1a: *India (FY 1987 – FY 2019)***




Source: RBI, MoSPI

Note: Govt net balance = (Public Sector Financial & Non-Financial Corporations and General Govt Gross Domesic Saving) – (Public Sector Financial &Non-Financial Corporations and General Govt Gross Capital formation)
Private sector net balance = Private sector Gross Domesic Saving – Private sector Gross Capital formation
For Households, total savings does not include gold and silver (to make it comparable).

**Figure 1b:** ***United States (1987 – 2019)***

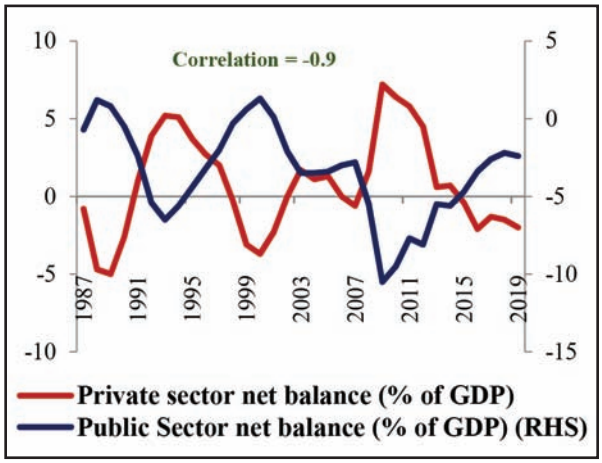



Source: BEA (US)

Government net Balance =Total Government Receipts-Total Government Expenditure

Private Sector Net Balance= Gross Private Domestic Investment - Gross Private Savings (Domestic business, households & institutions)

**Figure 1c:** ***United Kingdom (1987 – 2019)***




Source: UK Economic Accounts (ONS) & OBR (UK)

Public Sector net Balance = Net lending by General Govt and Public Corporations

Private Sector Net Balance = Net lending by Households, Non Profit Institutions serving the Households and private Non Financial Corporations

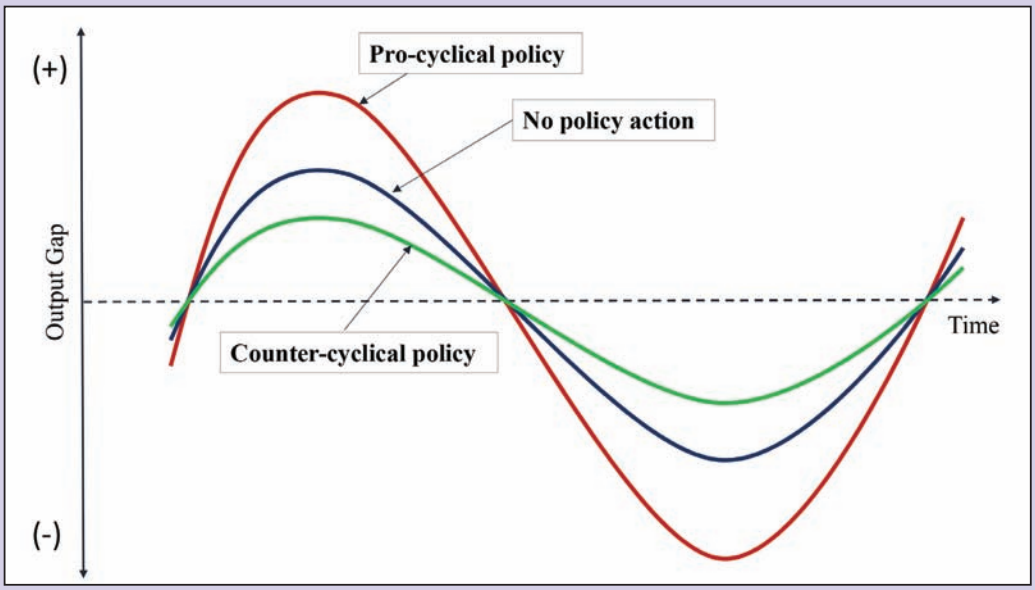
2.3 While counter-cyclical fiscal policy is necessary to smooth out economic cycles, it becomes critical during an economic crisis (Box 1). This is because fiscal multipliers, which capture the aggregate return derived by the economy from an additional Rupee of fiscal spending, are unequivocally greater during economic crises when compared to economic (Box 2). In a country like India, which has a large workforce employed in the informal sector, counter-cyclical fiscal policy becomes even more paramount. In advanced economies, where the public and private sector labour markets are not too segmented, fiscal spending can increase public sector employment, reduce the supply of labour in the private sector, bid up wages, and thereby crowd out private sector employment. However, in a country like India, where the private and public sector labour markets are largely segmented, such crowding out of private sector employment is minimal (Michaillat, 2014). Thus, debt-financed public expenditure is more cost-effective to employ during recessions than during economic booms.

## Box 1: Relevance of Counter-cyclical Fiscal Policy

Indian Kings used to build palaces during famines and droughts to provide employment and improve the economic fortunes of the private sector. Economic theory, in effect, makes the same recommendation: in a recessionary year, Government must spend more than during expansionary times. Such counter-cyclical fiscal policy stabilizes the business cycle by being contractionary (reduce spending/increase taxes) in good times and expansionary (increase spending/reduce taxes) in bad times. On the other hand, a pro-cyclical fiscal policy is the one wherein fiscal policy reinforces the business cycle by being expansionary during good times and contractionary during recessions (Figure A).

| Fiscal policy (FP) stance | Recession (↓ GDP) | Expansion (↑ GDP) | Outcome |
|---|---|---|---|
| Pro-cyclical | Contractionary FP<br>↓ Govt. Expenditure or /and<br>↑ Taxes | Expansionary FP<br>↑ Govt. Expenditure or/and<br>↓ Taxes | Deepens recessions and amplifies expansions, thereby increasing fluctuations in the business cycle. |
| Counter-cyclical | Expansionary FP<br>↑ Govt. Expenditure or/and<br>↓ Taxes | Contractionary FP<br>↓ Govt. Expenditure or /and<br>↑ Taxes | Softens the recession and moderates the expansions, thereby decreasing fluctuations in the business cycle. |

**Figure A: Business Cycle under Various Fiscal Policy Stance**




**Channels of Transmission**

Recalling the National Income identity , Y= C+I+G+X-M , the net effect of a recession on the private sector may be in terms of lower private consumption (C), lower private investment (I), risk aversion by the private sector and pessimistic expectations/sentiments. In such a scenario, adopting a counter cyclical policy by expanding the Government Expenditure – both consumption and investment - will support the GDP and minimise the output gap (as seen in the figure above). This happens primarily through the following channels:

(i) An expansion in Government expenditure can cushion the contraction in output by contributing to the GDP growth, by offsetting the decline in consumption and investment; and also by boosting private investment and consumption through higher spending multipliers during recession. (Auerbach and Gorodnichenko (2012), Riera-Crichton, Vegh and Vuletin (2014), Jorda and Taylor (2016), Canzoneri et al (2012)).

(ii) Through risk multiplier by compensating for greater risk-aversion of private sector to bring back 'animal spirits'.

(iii) Through expectation multiplier by building confidence in tough times: Governments adopting counter-cyclical fiscal policy are able to credibly exhibit their commitment to sound fiscal management. As a result, rational agents in the economy would expect the economy not to fluctuate as much and therefore their private actions would reinforce this, in turn enabling stronger macroeconomic fundamentals (Konstantinou and Tagkalakis (2011), Alsina et al. (2014)).

Numerous studies in economic literature establish this relationship both theoretically and empirically. Ozkan and McManus (2015) study the impact of cyclicality of fiscal policy on macroeconomic outcomes for 114 countries over 1950–2010 and establish that following a pro-cyclical fiscal stance leads to lower economic growth, higher volatility in output and higher levels of inflation. In contrast a counter-cyclical fiscal policy stance with policy actions against the cycle acts as a stabiliser by reducing output volatility and keeping growth on a steady path. Similarly a study by Kharroubi and Aghion (2008) shows that industries have grown faster in economies where fiscal policy has been more countercyclical, both in terms of output and productivity.

For India, in the current scenario, when private consumption, which contributes to 54 per cent of GDP is contracting, and investment, which contributes to around 29 per cent is uncertain, the relevance of counter-cyclical fiscal policies is paramount. In fact as Krugman prescribed, a sustained, productive program of permanent stimulus directed towards public investment, in both physical and human capital, is the need of the hour (Krugman 2020).

## Box 2: Higher Fiscal Multipliers During Economic Slowdown

Most studies aimed at estimating the variation in effects of fiscal policies with country's position in the business cycle, concur that the fiscal policies are considerably more effective in recessions than in expansions (Barro and Redlick (2011), Auerbach and Gorodnichenko (2012), Fazzari et al. (2015), Ramey and Zubairy (2015)). Auerbach and Gorodnichenko (2012(i), (ii)) in their seminal paper show large differences in the size of spending multipliers in recessions and expansions for the OECD countries and the US, with higher fiscal multipliers during recessionary regimes. These results are maintained after allowing for different multipliers for different components of government spending. They derive the point estimates of the maximum output multiplier (over the first 20 quarters) is estimated to be 0.57 during expansions and 2.48 during recessions in the US.

Riera-Crichton, Vegh and Vuletin (2014) condition the fiscal policy on both the state of the business cycle, and the sign/size of the fiscal intervention, and find that fiscal expansions in recessions are much more expansionary than fiscal expansions in booms. Jorda and Taylor (2016) use the propensity-score based methods for time series data to show that a one per cent of GDP fiscal consolidation translates into a loss of 4 per cent of real GDP over five years when implemented in a slump, and just 1 per cent in a boom.

Different studies attribute this phenomenon of counter-cyclicality of the fiscal multipliers to different channels. Some of these are:

1. **Easing financial constraints:**
    - Tagkalakis (2008) shows that the fiscal policy is more effective in boosting private consumption during recessions (for OECD countries from 1970-2002) due to the presence of binding liquidity constraints on households. Since during recessions liquidity constraints might bind across a wider range of households and firms, thus a larger fraction of households and firms will consume the extra income generated following an unanticipated tax cut or government spending increase, leading to greater impact on consumption (wealth effect) and hence output.
    - On similar lines, Canzoneri et al (2012) argue that fiscal stimulus decreases the spread (between the bank deposit rate and the bank loan rate), which fluctuates counter cyclically due to the cyclical variation in bank intermediation costs. This in turn encourages more borrowing and spending, which further expands the economy and decreases the spread again, encouraging more borrowing; and the process repeats itself. Since this financial friction (spread) increases during recession, therefore the chain effect of fiscal stimulus in boosting borrowings and output is greater during recession compared to expansionary periods.
    - Fiscal multipliers are likely to be higher in recessionary periods because private savings increase through the precautionary motive to save. Therefore, any potential crowding out of private investment - even if at all it manifests during expansionary periods - is unlikely to manifest because of the increased pool of loanable funds.
    - Michaillat (2014) documents another channel through the labour market that enhances the fiscal multipliers in a recession. Increasing public employment stimulates labour demand, which increases tightness and therefore crowds out private employment. Critically, the quasi-labour supply is convex. Hence, when labor demand is depressed and unemployment is high, the increase in tightness and resulting crowding-out are small.
2. **Enhanced consumer sentiment for future productivity increases:**
    - Bachmann and Sims (2011) argue and present evidence that a spending shock during periods of economic slack leads to a persistent increase in the amount of government investment relative to government consumption during a downturn(which is not the case in normal times). This relative increase in government investment spending provides signals about future increases in output and productivity, and hence are reflected in higher measured confidence. This results in higher impact on consumption and output.

## THE (r-g) DIFFERENTIAL AND DEBT SUSTAINABILITY IN INDIA

2.4 As fiscal policy relates very closely with the debate on public debt, we start by understanding the conceptual underpinnings of the relationship between public debt and growth, as seen in the simple equation for debt dynamics discussed in Box 3. From the equation, it can be seen that the debt-to-GDP ratio remains stable over time (i.e. $d_t = d_{t-1}$) if the primary deficit is equal to

**$(g-r)\cdot d_{t-1}/(1+g)$**, where g and r denote the real growth rate and real cost of general government debt respectively while $d_{t-1}$ denotes the debt-to-GDP ratio in the previous year. When g > r, this threshold level of primary deficit is positive. Therefore, as long as the primary deficit remains below this threshold, debt remains sustainable. Along these lines, De Luca (2012) show that as long as primary deficit is a constant fraction of GDP, (r-g) still remains a sufficient statistic for debt sustainability. Thus, the ease with which a government can reduce its debt-to-GDP ratio ($d_t$) depends primarily on the interest rate-growth differential (IRGD hereafter) or (r-g). More negative the IRGD, the easier (and quicker) it is for the Government to ensure debt sustainability. Conversely, if the IRGD is positive, the harder (and slower) it is for the Government to ensure debt sustainability. A negative IRGD thus creates an enabling environment for debt sustainability.

## Box 3: Theory of Debt dynamics

*The simple identity for debt dynamics provides an accounting framework to decompose change in the ratio of government debt-to-GDP into its key drivers, namely (i) the difference between the (real or nominal) interest rate charged on the government debt and (real or nominal) growth rates; (ii) the debt-to-GDP ratio in the previous period, and (iii) the ratio of primary deficit to GDP.*

*The identity for debt dynamics is written as:*

$$\Delta d_t = (r_t - g_t).d_{t-1} / (1+g_t) - pb_t ,$$

*where* $\Delta d_t$ *: change in general government debt-to-GDP in year t;*

$r_t$ *: real interest rate paid in year t;*

$g_t$ *: real GDP growth in year t;*

$d_{t-1}$ *: general government debt-to-GDP in in year (t-1);*

$pb_t$ *: primary balance-to-GDP in year t.*

*The same identity can also be written using nominal interest rate and nominal growth rate:*

$$\Delta d_t = (i_t - \gamma_t).d_{t-1} / (1+\gamma_t) - pb_t ,$$

*where* $i_t$ *: nominal interest rate paid in year t;*

$\gamma_t$ *: nominal GDP growth in year t*

*and other variables are as above.*

*This equation can be derived from the basic identity that inflows and outflows have to be equal for the Government i.e.*

$$\underbrace{D_t}_{\text{Debt borrowed in year } t} + \underbrace{R_t}_{\text{Revenues in year } t} = \underbrace{D_{t-1}}_{\text{Repayment of debt borrowed in year } t-1} + \underbrace{I_t}_{\text{Interest on debt borrowed in year } t-1} + \underbrace{NIE_t}_{\text{Non-interest expenditure in year } t}$$

*or*

$$D_t = D_{t-1} + i_t D_{t-1} - PB_t$$

*where* $PB_t$ *is the primary balance defined as* $NIE_t$ *-* $R_t$ *and*

$i_t$ *is the interest paid on the debt in year t.*

*On dividing both sides of the equation by $GDP_t$, and denoting all ratios as proportion of GDP by their lower-case letters, i.e. $d_t \equiv D_t / GDP_t$ for instance, we get:*

$$d_t = \frac{1 + i_t}{1+\gamma_t} d_{t-1} - pb_t$$

*where we substitute* $\frac{GDP_t}{GDP_{t-1}} = (1+\gamma_t)$.

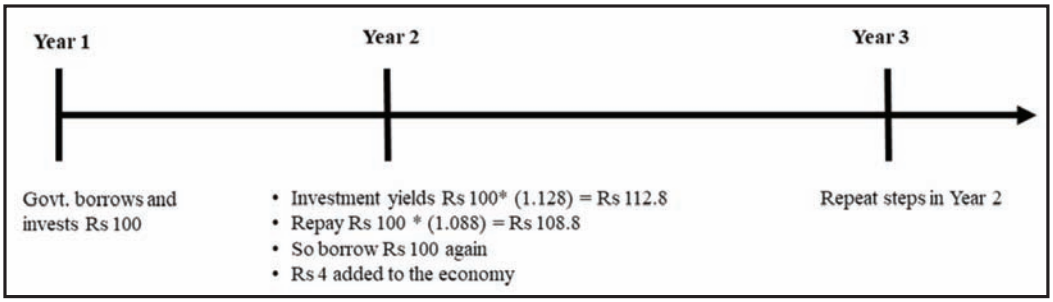
*Subtracting $d_{t-1}$ from both sides of the above equation, we get the first equation above using real interest and growth rates.*

*We know from the Fisher's equation that $(1 + i_t) = (1 + r_t)(1 + \pi_t)$ and $(1 + \gamma_t) = (1 + g_t)(1 + \pi_t)$, where $\pi_t$ denotes the inflation in year t. Using the same, we get:*

$$d_t = \frac{1 + r_t}{1 + g_t} d_{t-1} - pb_t$$

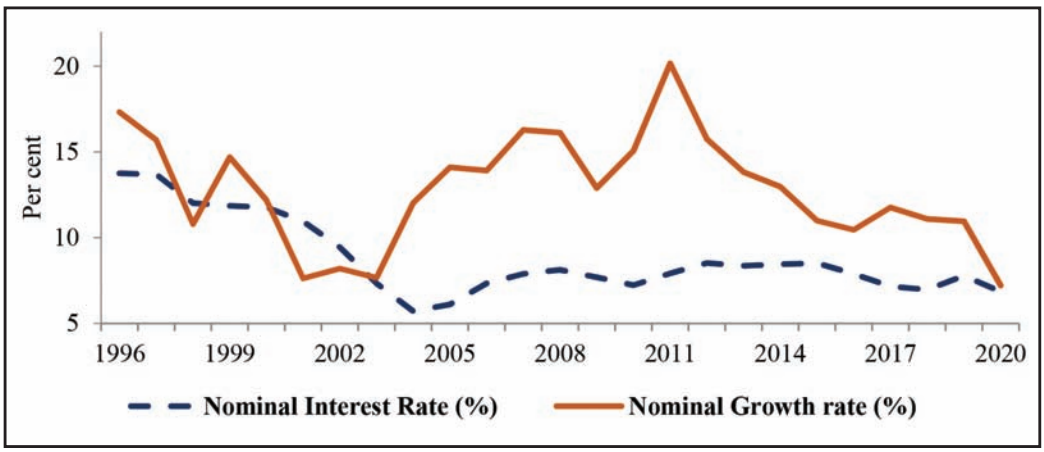
*Note that both the equations – the one using nominal interest and growth rates and that one using real interest and growth rates – are identical and equivalent to each other. Sometimes, doubt arises if the two equations are indeed identical? This is because of the comparison between the fractions* $\frac{r_t - g_t}{1 + g_t}$ *and* $\frac{i_t - \gamma_t}{1 + \gamma_t}$. *It appears as though the only difference is in the denominator of the fraction with the real growth rate replaced by the nominal growth rate because the differences (r-g) and (i-γ) must be identical. The confusion arises from using the approximation $i \approx r + \pi$ and $\gamma \approx g + \pi$, which leads to the incorrect inference that (r-g) and (i-γ) must be identical. However, the confusion gets settled when one recognizes that these are only approximations where the product terms in the Fisher equation ($r \cdot \pi$ and $g \cdot \pi$) have been ignored.*

2.5 As a norm in India, over the last two and a half decades, GDP growth rates have been greater than interest rates (Figure 2a). This evidence is consistent with the phenomenon described by Blanchard (2019) in his 2019 Presidential Address to the American Economic Association: *"If the interest rate paid by the government is less than the growth rate, then the intertemporal budget constraint facing the government no longer binds."* Intuitively, when $i_t > \gamma_t$ or nominal growth rate exceeds the nominal interest rate for the foreseeable future, debt sustainability is obtained as explained in the figure below. Here, $i_t$ and $\gamma_t$ are taken to be their historical averages for last 25 years, 8.8 per cent and 12.8 per cent respectively. As the government's investment of a ₹ 100 produces ₹112.8 while the principal and interest repayment equals ₹108.8, ₹ 4 can be added to the economy after the loan of ₹ 100 is rolled over to the next period. Of course, this roll-over of the debt that yields debt sustainability can only manifest if $i_t > \gamma_t$. If the inequality reverses, then rollover of debt does not become automatic, thereby jeopardizing debt sustainability.

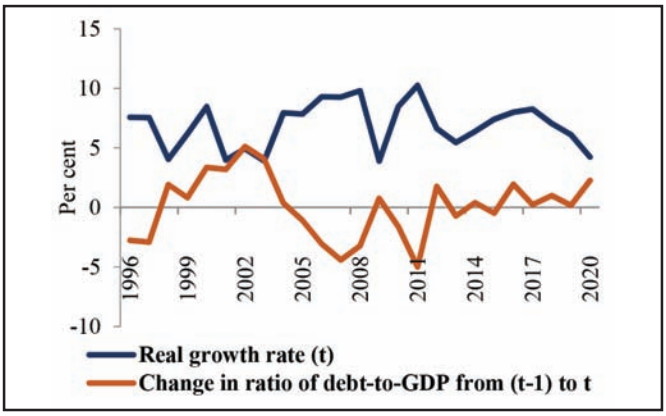



2.6 This inequality has thus led to a negative IRGD for most of the years during the last two and a half decades, which, in turn, has caused debt levels to decline. Figure 2c shows the strong correlation observed between IRGD and change in general government debt. Since this inequality reduces the fiscal costs of a debt rollover (Blanchard 2019), it expands the scope for fiscal policy to (i) cater to slowdowns in aggregate demand and (ii) thereby enable growth to foster debt sustainability.

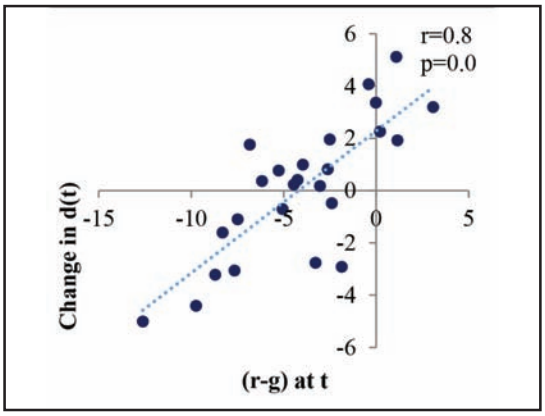
**2a: During the Last 25 years, i > γ is a Norm, Except for a Short Period During the Asian Financial Crisis**




**2b: Trends in real growth rate (g) and change in debt-to-GDP ratio (d)**




**2c: Strong correlation between (r-g) and change in debt to GDP ratio**




Source: RBI, MoSPI
Note: d (t) - General Government Debt as a per cent of GDP at time period (t),
Debt for 2018-19 is RE and 2019-20 is BE.
Years represented in the figures are FY ending.
Nominal interest rate is the weighted average interest rate on Central Govt securities,
Real interest rate is calculated using the Nominal interest rate and GDP deflator

2.7 A closer look at the trends in interest rate and growth rate in India highlights a perceptibly higher variability in the growth rates relative to interest rates over the past two-and-a-half decades (Figure 3a). This implies that changes in IRGD are mostly attributable to changes in growth rates rather than the changes in interest rates (Figure 3b, 3c, 3d). Thus, it is a higher growth that provides the key to the sustainability of debt for India (Figure 2 b).

**Figure 3: Change in GDP growth rate (γ) explains most of the variation in Interest Rate Growth Differential (i-γ) during last 25 years (FY1996 to FY2020)**

**Figure 3a: Decomposition of variation in (i-γ)**

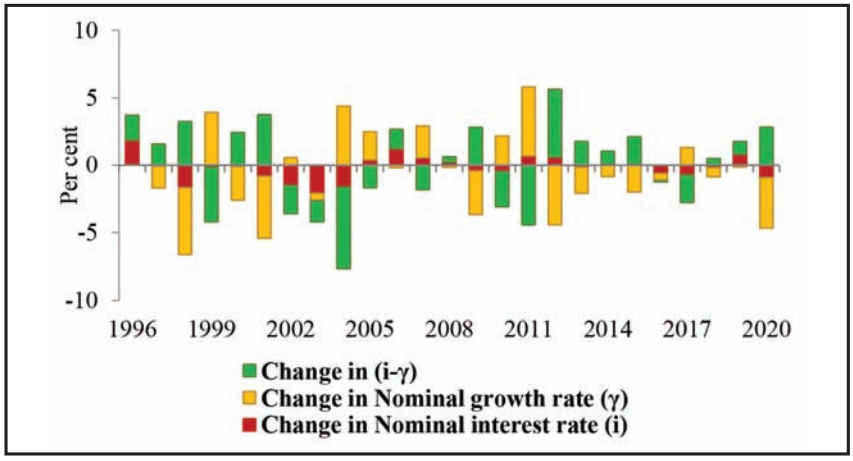



**Figure 3b: Variability in i and γ**

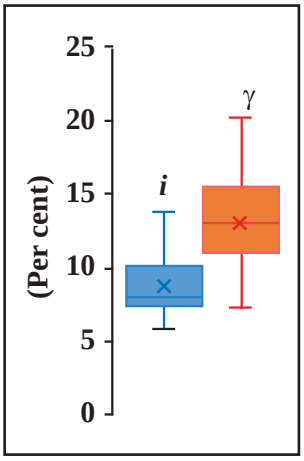



**Figure 3c : Strong correlation between variation in γ and variation in (i-γ)**

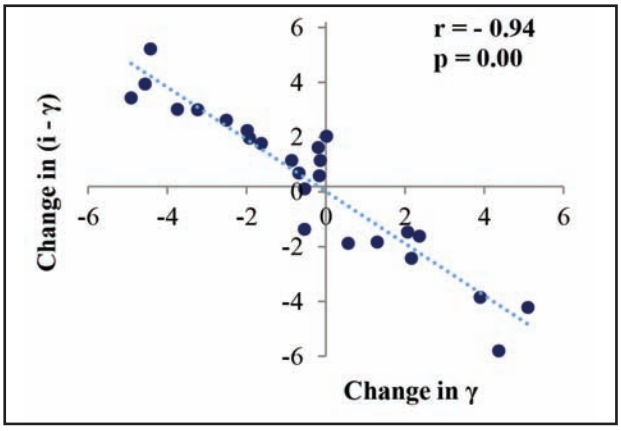
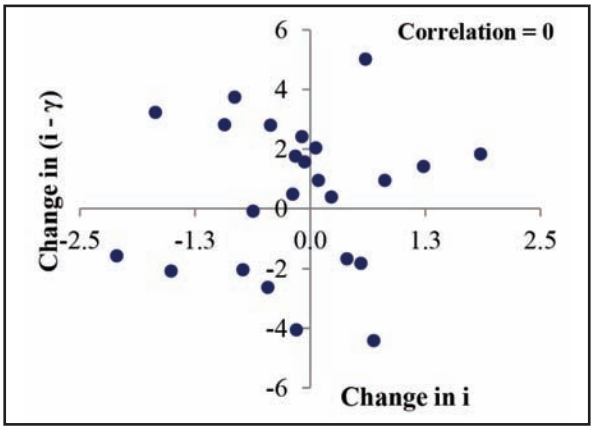



**Figure 3d : No correlation between variation in i and variation in (i-γ)**



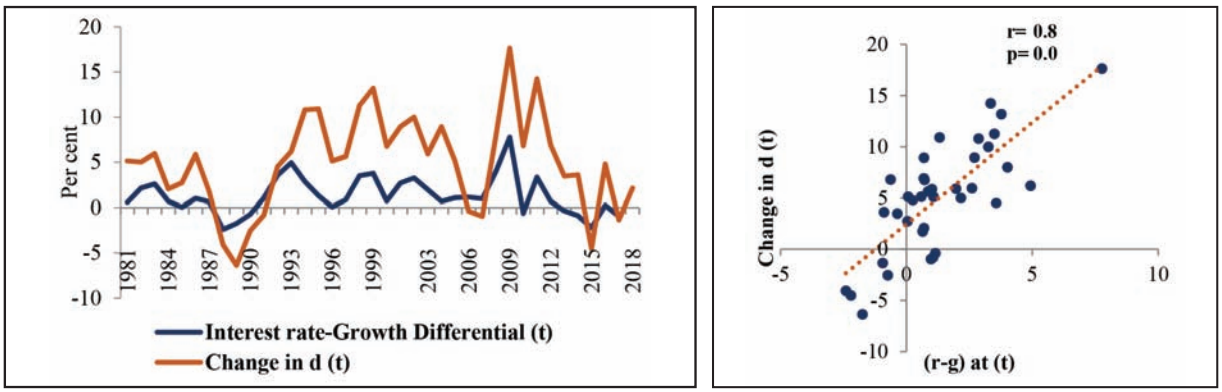

Source: RBI, MoSPI

## THE IRGD AND DEBT SUSTAINABILITY FOR OTHER ECONOMIES

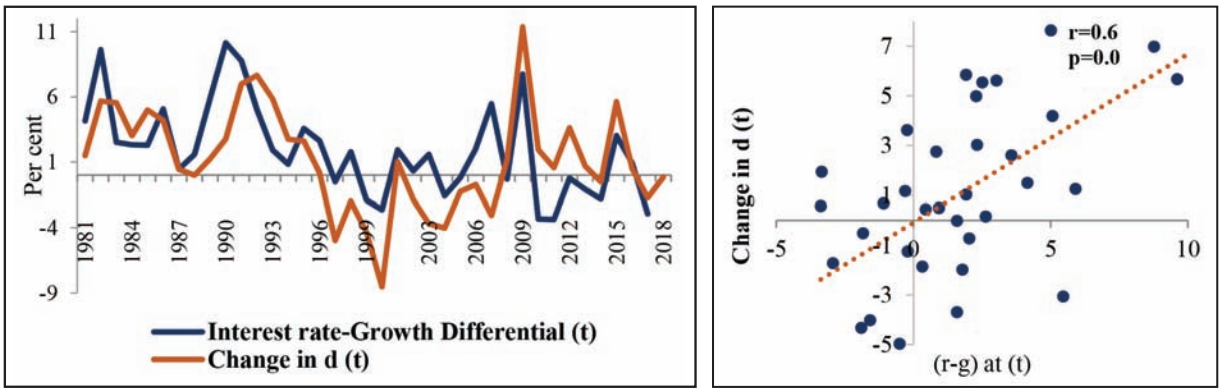
2.8 Similar to the Indian experience, a strong correlation between IRGD and incremental debt-to-GDP ratio is seen for other countries (Figure 4). It may be seen from the Figures that the years that correspond to negative IRGD are accompanied by a steeper decline in debt levels across the countries.

**Figure 4: Relationship between IRGD (r-g) and Change in Government debt-to-GDP (d) across countries**

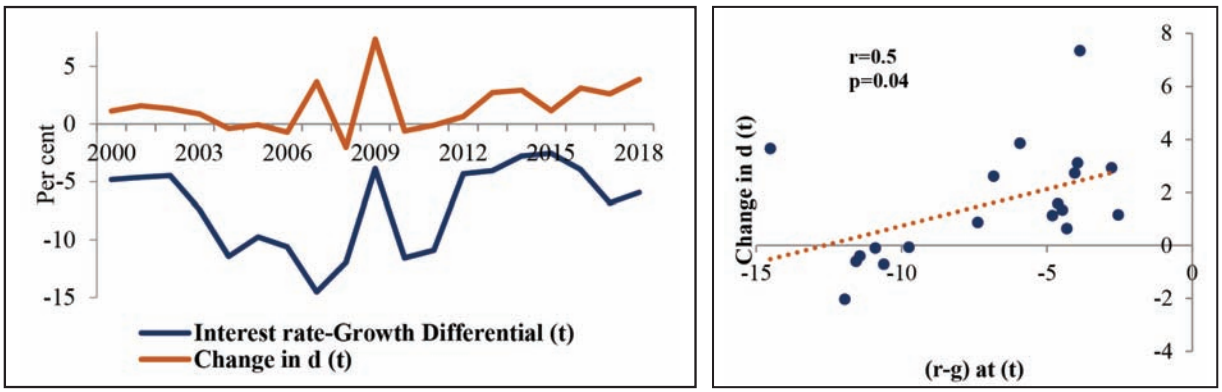
***Japan***



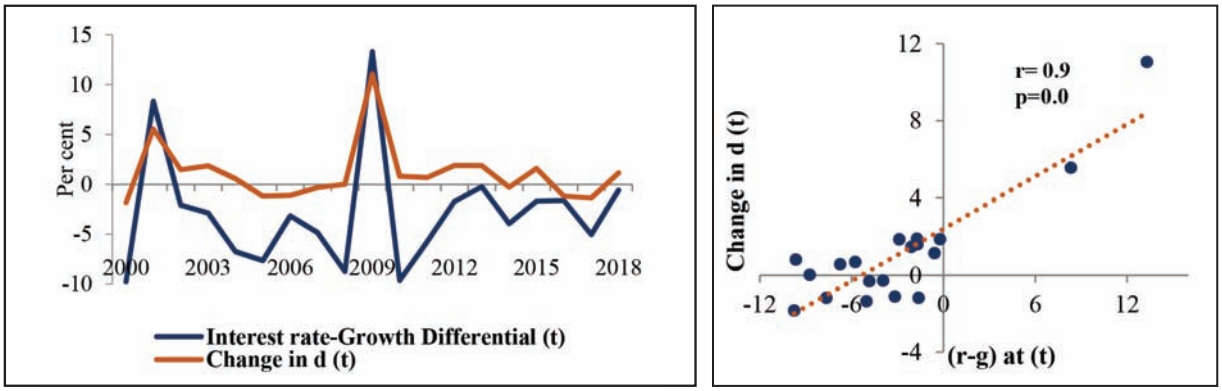

***Canada***



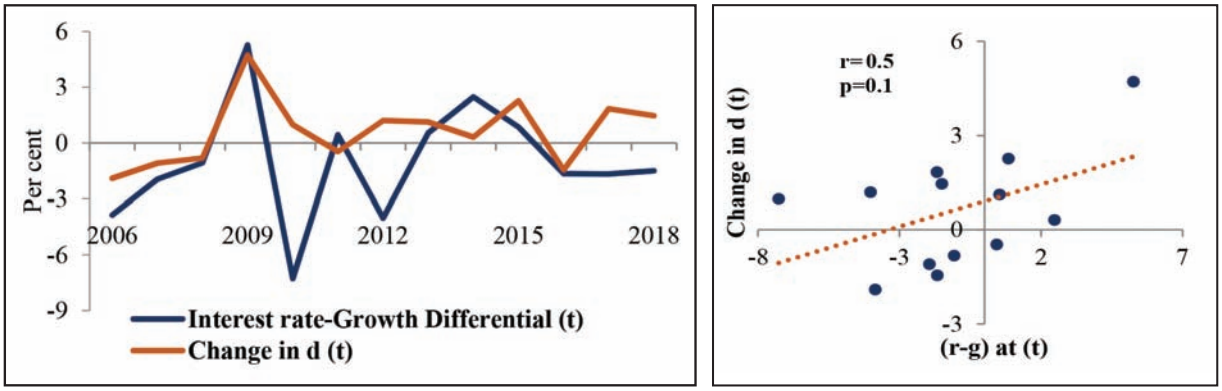

***China***



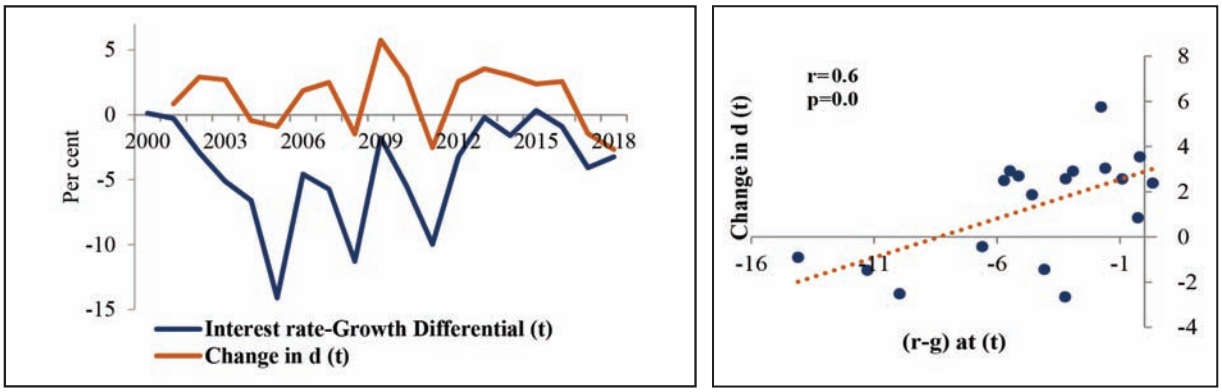

***Malaysia***



***Thailand***




***Vietnam***

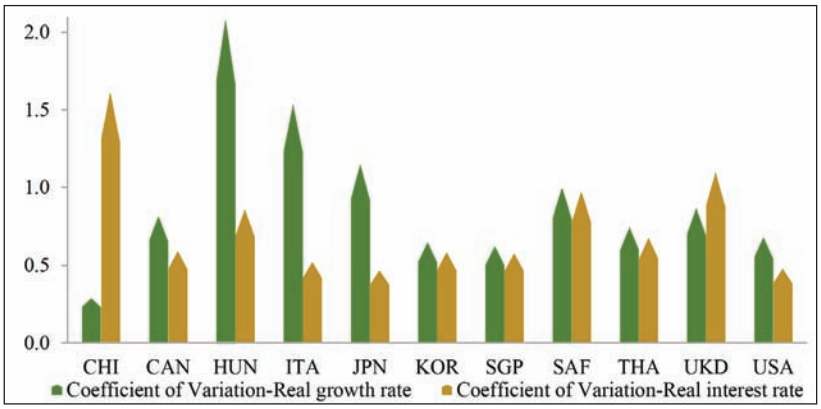



Source: IMF World Bank
Notes: d: Change in General Government Debt as a per cent of GDP r: Real interest rate; g: Real growth rate
The data for EMEs is taken starting from the year 2000 due to data constraint.
Data for Thailand is available from 2006.

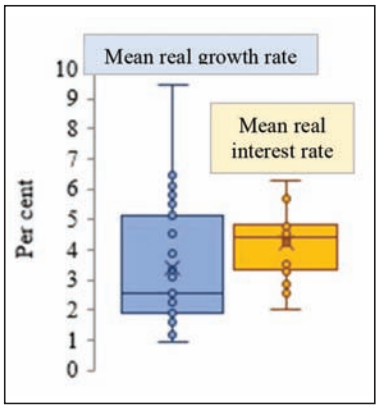
2.9 Cross country evidence also suggests that, within countries, growth rates vary far more across time than interest rates (Figure 5a). In fact, a higher variability is observed in mean growth rates

**Figure 5: Variation in g vis-à-vis variation in r (1980 – 2018)**

**5a. Variation in growth rates and interest rates within countries**




**5b. Variation in average growth rate and average interest rate across countries**




Time period: 1980 to 2018
Source: IMF, World bank
Countries such as Brazil, France, Germany have not been included due to non-availability of data on real interest rate in World Bank data portal; the panel is unbalanced.

across countries relative to the variation in average interest rates (Figure 5b). Thus, when taken together, both the within-country and across-country variation clearly imply that the variability in IRGD depends primarily on variation in g. Thus it is important to examine the dynamics of debt sustainability for high growth economies separately from that for low growth ones.

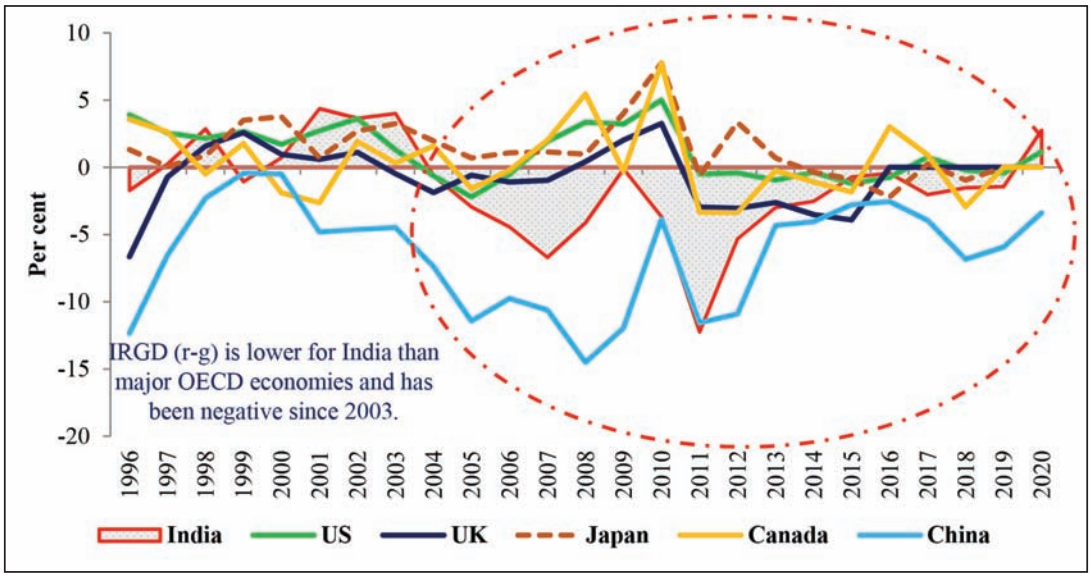
2.10 On analyzing the averages of real interest rate, real growth rates and IRGD for the period 1990-2018 across selected emerging and advanced economies, it can be seen that India – as one of the high growth economies – is amongst the countries having negative average IRGD, along with other countries such as China, Russia and Singapore (Table 1). This can also be seen from Figure 6 which shows that since 2003, India's IRGD has been negative and the lowest for the major OECD economies.

**Table 1: Averages and Variability of Real Interest Rates, Real Growth Rates and IRGD for the Period 1990-2018**

| | r | | | g | | | r-g | | |
|---|---|---|---|---|---|---|---|---|---|
| | Average | Median | SD | Average | Median | SD | Average | Median | SD |
| **Canada** | 3.3 | 3.4 | 2.2 | 2.3 | 2.7 | 1.8 | 1.0 | 0.8 | 3.2 |
| **China** | 1.9 | 2.4 | 3.5 | 9.6 | 9.4 | 2.3 | -7.8 | -6.7 | 5.2 |
| **India** | 2.6 | 2.8 | 2.6 | 6.5 | 6.6 | 2.1 | -3.9 | -3.6 | 3.5 |
| **Indonesia** | 5.2 | 6.5 | 7.6 | 5.0 | 5.4 | 3.9 | 0.1 | 1.2 | 5.7 |
| **Italy** | 4.8 | 3.8 | 2.5 | 0.7 | 1.3 | 1.8 | 4.1 | 3.0 | 2.9 |
| **Japan** | 2.7 | 2.9 | 1.4 | 1.0 | 1.2 | 1.8 | 1.7 | 1.1 | 2.1 |
| **Russia** | 0.2 | -0.3 | 9.2 | 1.0 | 2.2 | 6.5 | -3.2 | -4.6 | 13.0 |
| **Singapore** | 4.3 | 4.3 | 2.4 | 5.9 | 6.0 | 3.8 | -1.6 | -1.9 | 5.4 |
| **UK** | 1.9 | 1.8 | 2.8 | 2.0 | 2.4 | 1.7 | -0.1 | -0.1 | 2.9 |
| **US** | 3.7 | 3.1 | 2.0 | 2.5 | 2.8 | 1.6 | 1.2 | 0.8 | 2.0 |

Source: IMF, RBI, World Bank (SD-Standard Deviation)

**Figure 6: Comparison of IRGD for India with other countries over the last 25 years**




Source: IMF, RBI, World Bank

## IN INDIA, GROWTH LEADS TO DEBT SUSTAINABILITY, NOT VICE-VERSA

2.11 How does the consistently negative IRGD affect the relationship between debt and growth in India? Does higher growth lead to lower debt or lower debt cause higher growth? Conceptually, causality could flow in either direction. The argument supporting higher debt leading to lower growth is as follows: higher levels of public debt are accompanied by more taxes in the future to pay for the debt, thereby leading to lower lifetime wealth, which may decrease consumption and savings, eventually resulting in lower aggregate demand and growth rates. If higher public debt (i.e. lower public savings) is not accompanied by increase in private savings, it may also lead to lower total savings in the economy. This may put upward pressure on the interest rates, resulting in crowding out of investment and thus negatively impacting the growth rates. On the other hand, as described in Box 3, higher GDP growth leads to lower public debt through the increase in the denominator, i.e. GDP.

### Box 4: The Modigliani-Miller theorem, Principles of Corporate Finance and Sovereign Debt

"As others have done before, one can think of countries as corporations. While obviously highly reductive, consolidating all agents in a country into a single representative decision-maker has the advantage of bringing out in a simple way the economic objectives of a nation and the constraints that it faces, *in particular its financial constraints*. The drawback, as with corporations, is that the consolidation buries all inside agency and governance issues." (emphasis added)

– Patrick Bolton, Presidential Address to the American Finance Association titled "Debt and Money: Financial Constraints and Sovereign Finance", 2016

Before the Global financial crisis, macroeconomics largely ignored the role of finance and the financial sector. However, recent macroeconomic research incorporates the role of finance in the macro-economy. So, to think carefully and clearly about a country's fiscal policy and how the same can impact its investment policy, a corporate finance perspective *a la* Patrick Bolton (2016)'s presidential address at the American Finance Association is useful. The study postulates that fiat money in a country resembles the equity in a corporation because a Rupee of fiat money enables the owner to a lay a one Rupee claim on the country's output just like a share of common stock entitles the holder to a pro-rata share of residual cash flows of a firm; higher the fiat currency owned by a citizen, greater the claims that the citizen can lay on the country's output. By drawing this clever parallel, Bolton (2016) employs the principles of corporate finance to theoretically model the choice of sovereign debt for a country.

To think about sovereign debt in this framework, it is useful to start with the Modigliani-Miller theorem (Modigliani and Miller, 1958), which provides the conceptual bedrock for thinking about debt and capital structure. The theorem posits that, under certain ideal conditions described below, the amount of debt or the capital structure of a firm (or a sovereign by extension) is irrelevant. The theorem employs the concept of "homemade leverage" to arrive at this important conclusion. Homemade leverage is a financial concept that holds that as long as investors can borrow on the same terms as a firm, which prevails only under ideal conditions, they can artificially duplicate the effects of corporate leverage by creating their own homemade leverage to either nullify or duplicate any debt-equity choice made by the firm. Therefore, under ideal conditions, investors

would not care between investing in a firm having zero debt and one that chooses to have debt in its capital structure. Similarly, under ideal conditions, the investors in a country, which includes the citizens as equity holders via holders of fiat money, would not care about the amount of debt raised by the country.

As with most theories, the practical utility of the Modigliani-Miller theorem arises from understanding the precise set of conditions that lead to its failure, specifically from the ways in which the postulated ideal conditions get violated in practice. In fact, as Miller (1988) reviewed, "showing what *doesn't* matter can also show, by implication, what *does*." (emphasis in original) Relaxing the assumptions that lead to the ideal conditions enables us to understand what practical considerations do impact capital structure. These are absence of taxes, bankruptcy costs, agency problems or asymmetric information and the presence of complete markets in the Arrow-Debrew formulation. If all these assumptions hold, then investors/citizens can borrow on the same terms as a firm/ sovereign.

In developing economies such as India, the presumption that citizens can borrow on the same terms as the sovereign gets violated sharply because of the combination of bankruptcy costs and asymmetric information, which in turn result in lack of access to credit markets for large sections of the population. In developing economies such as India, the wedge between the cost of borrowing for the sovereign and the cost to an average (common) citizen is much higher than in developed economies. This wedge includes the costs faced by the average citizen on both the intrinsic and extrinsic margins, i.e. the interest rate paid conditional on being able to borrow and the cost from being credit rationed respectively. Therefore, the application of the homemade leverage argument leads to the inference that fiscal multipliers would be significantly higher in a developing economy such as India than in developed economies.

The Bolton (2016) analysis also highlights the importance of fiscal policy to fund capital investment, especially during periods of economic crisis. The literature in corporate finance highlights that financing constraints impact investment materially. As financing constraints faced by the private sector get significantly exacerbated during an economic crisis, the role of the sovereign in using fiscal policy to foster investment becomes particularly salient in a crisis. As Bolton (2016) notes "If there is one deep, general, lesson from the global financial crisis of 2007-09, it is that financial constraints matter: they bite a little most of the time, a lot some of the time (and they are deadly in extreme crises). What is more, when they bite a lot the stagnation they engender persists for long stretches of time... So, what makes corporate finance relevant is the universal presence of financial constraints. At the margin, most economic decisions are affected by financial constraints. Understanding these constraints, therefore, helps us better understand economic decision-making. And understanding how to relax financial constraints helps us achieve more efficient resource allocation." Financial constraints faced by the private sector – including firms and households – are particularly biting during periods of economic crisis and when they bite a lot the stagnation they engender persists for long stretches of time. Therefore, the wedge between the costs of borrowing for the sovereign and that for the citizens, including corporate citizens, is disproportionately larger during periods of economic crisis.

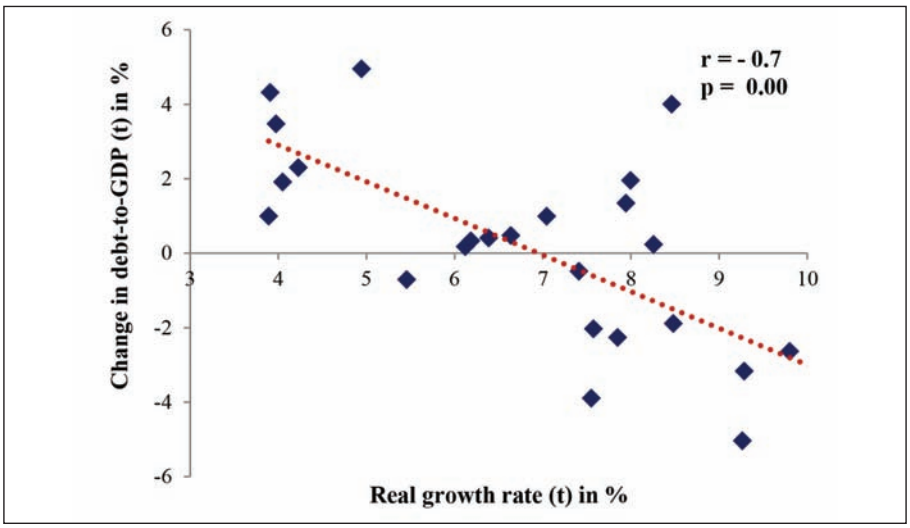
Bolton (2016)'s analysis highlights potential inflation as the primary cost of raising debt in the domestic currency. A domestic-currency sovereign bond is, in effect, a pay-in-kind note

because the bond has to be repaid using fiat domestic currency, which is in turn a claim on the nation's output. Therefore, debt denominated in the domestic currency is in effect a claim on the nation's (future) output. Seen this way, an interesting parallel arises between the costs of dilution from fresh equity issuance and costs due to inflation, which essentially dilutes the value of future output, when more money is printed. Incumbent equity holders in a company see their ownership diluted when the company issues stock to new equity holders at a price below its intrinsic value. This, however, does not mean that any stock issue necessarily involves dilution of value for incumbent equity holders. As Stein (1996) and Baker, Stein and Wurgler (2003) have argued, corporations can also be in situations where they are able to issue new shares when the company's share is overvalued. In such situations, the equity issue, in effect, results in more valuable ownership for incumbent shareholders. Similarly, printing more money can result in inflation and loss of purchasing power for domestic residents if the increase in money supply is larger than the increase in output. However, as with new stock issues and dilution, printing more money does not necessarily lead to inflation and a debasement of the currency. In fact, if the increased money supply creates a disproportionate increase in output because the money is invested to finance investment projects with positive net present value (where such value incorporates all the societal value generated by the investment), the increased money supply is beneficial to the citizens.

2.12 Evidence over the last two-and-a-half decades demonstrates clearly that in India, higher GDP growth causes the ratio of debt-to-GDP to decline but not vice-versa. An examination of the contemporaneous correlation between real GDP growth and ratio of general government debt-to-GDP – though clearly negative and statistically significant as seen in Figure 7 – does not provide clarity about the direction of causation.

2.13 Inferring the direction of causation that manifests in India is important because the negative contemporaneous correlation seen in Figure 7 can be incorrectly interpreted as higher debt causes the GDP growth rate to decline, when it is possible that the direction of causation is exactly the opposite – higher GDP growth rate causes the debt as a percentage of GDP to decline.

**Figure 7: Contemporaneous relationship GDP growth and change in general government debt for India (FY 1996 to FY 2020)**




Source: RBI, MoSPI

2.14 To infer the direction of causation, we examine the differences in their lagged correlations. Figure 8 demonstrates the lagged relationship between real GDP growth rates and change in general government debt-to-GDP levels over the last 25 years. Over the last two-and-a-half decades, real GDP growth rates and one-year-ahead change in general government debt-to-GDP levels show a significant negative correlation. However, during the same time period, the correlation between change in general government debt-to-GDP levels and one-year-ahead growth rates turns out to be statistically indistinguishable from 0. The evidence therefore shows the direction of causality between the two variables: higher growth leads to lower public debt in India, but not vice-versa.

**Figure 8: Direction of causality between growth and change in GG debt for India (FY 1996 to FY 2020)**

**Figure 8a: Growth → Debt : Correlation between g and 1 year ahead Δd**

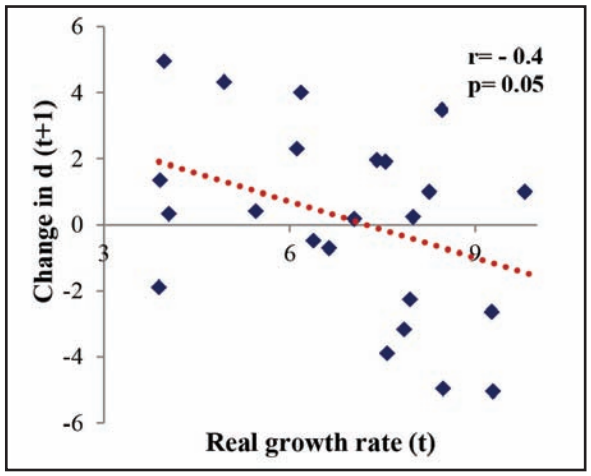
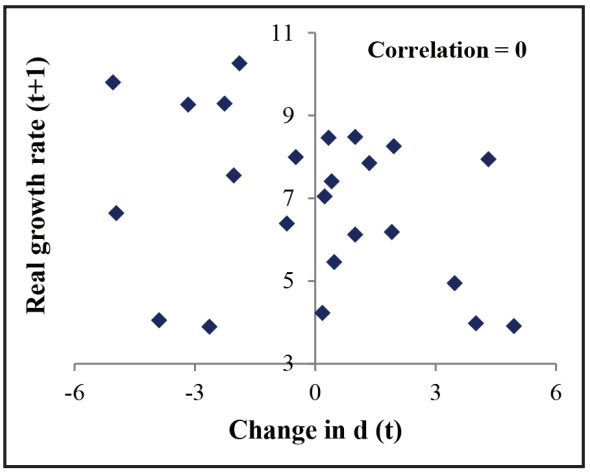



**Figure 8b: Debt → Growth : Correlation between Δd and 1 year ahead g**




Source: RBI, MoSPI
Note: d-General Government Debt-to-GDP ratio (per cent)
GDP 2011-12 series used
Debt used for 2018-19 is RE and 2019-20 is BE

## Box 5: Debt Sustainability through higher growth following the Asian Financial Crisis

Across economic crises over the last century, fiscal policy has been a prominent savior to bring back economic growth. For the past three decades, the Indian economic story has been characterized by long spells of high GDP growth. Fiscal policy has been a key determinant of growth acceleration after an exogenous global shock led to a decline in growth. Consider the shock due to the Asian Financial Crisis (1997-98). During the period 1997-98 to 2002-03, growth slowed down to an average of 5.3 per cent in real terms. Despite a fall in growth levels, an expansionary fiscal policy that focused on infrastructure spending was adopted by the Government[1]

1 This was combined with several reform measures that helped enhance productivity. Martin, Natarajan and Harrison 2017 show that removal of small scale reservations during early 2000s encouraged the overall employment growth and productivity of firms which were earlier consrainted by the size restrictions. On the other hand, the policy direction following the Global Financial Crisis was in stark contrast to that following the Asian Financial crisis. While fiscal spending was stepped up after the GFC, the quality of spending remained poor. Moreover, absence of reforms exacerbated the poor quality fiscal spend. (Bajpai, 2011)

Government expenditure increased consistently during these years, which led to general government debt reaching record levels. This fiscal push imparted the necessary impetus required for the growth to take off and average 8 per cent in real terms over the next six years from 2003-04 to 2008-09. High growth in this period brought debt down from the record high levels of 83 per cent of GDP attained in 2003-04 to around 70 per cent of GDP in 2009-10 (Figure 9a and 9b). This episode highlights that public debt – when productively streamlined – can enable the economy to reach a higher growth trajectory and, in turn, ensure debt sustainability.

**Figure 9a: Debt-to-GDP ratio increased to historically high levels during FY 1996- FY 2006 due to greater spending: Strong positive correlation between change in fiscal spending and 1 year ahead change in debt-to-GDP levels.**

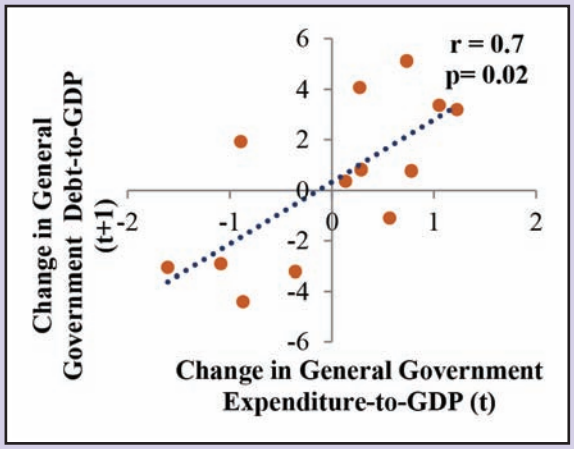
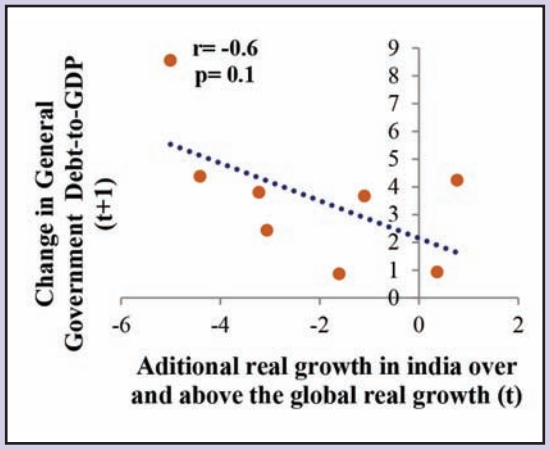



**Figure 9b: Debt-to-GDP ratio declined due to higher growth that resulted from FY 2003 to FY 2011: Negative correlation between additional real growth of India over and above the global real growth and 1 year ahead change in debt-to-GDP levels.**




Source: IMF, MoSPI, RBI

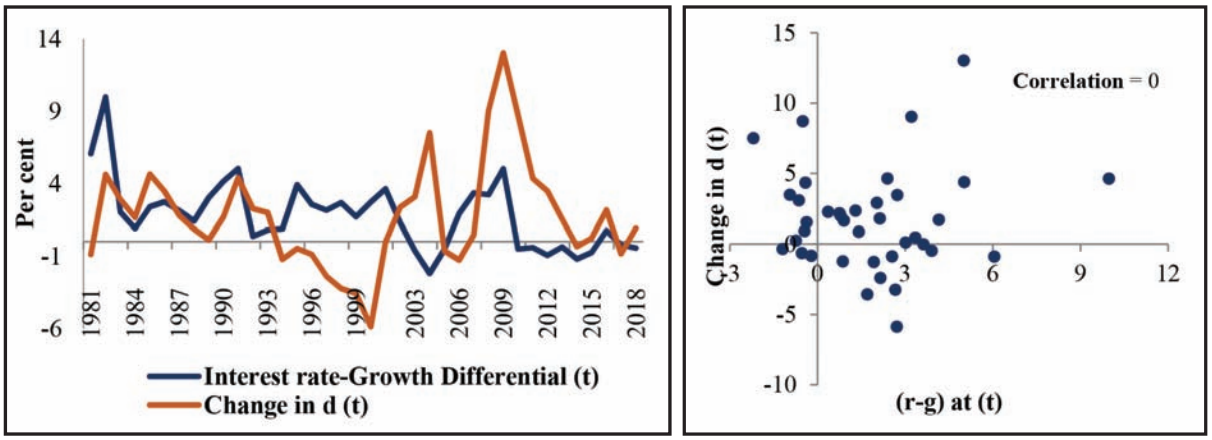
## DIRECTION OF CAUSALITY IN OTHER ECONOMIES

2.15 Is India an outlier, where higher growth rates lead to lower public debt but not vice-versa? The confusion about the direction of causality – from growth to debt sustainability or vice-versa – possibly stems from the fact that the academic and policy literature focuses primarily on advanced economies, where the direction of causality may be entangled by lower potential growth when compared to a high-growth economy such as India.

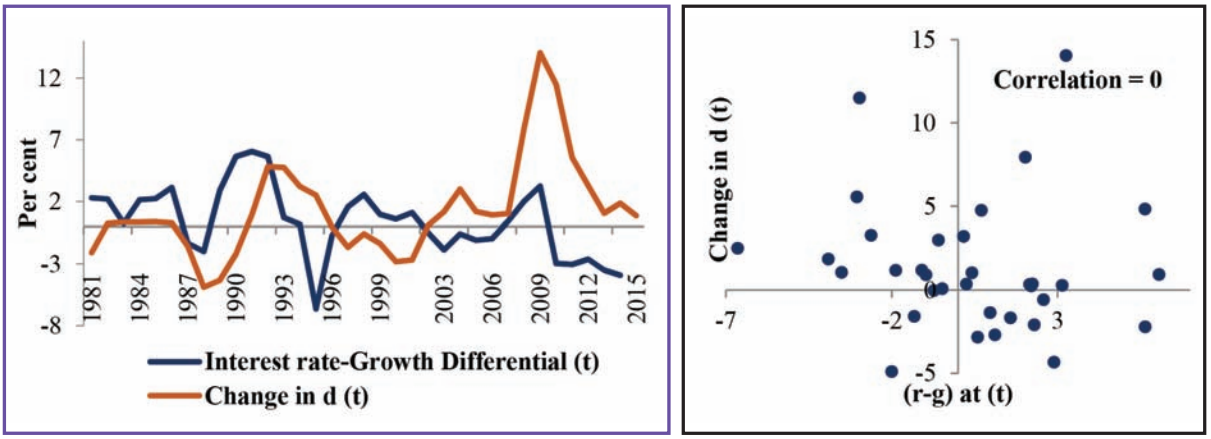
2.16 On examining the trends in IRGD and change in debt-to-GDP ratio for low growth economies like US and UK in Figure 10, no correlation is observed between the two variables. This indicates lack of evidence for direction of causality from real growth rate to government debt-to-GDP these countries.

**Figure 10: No correlation between IRGD and change in debt-to-GDP ratio for US and UK**

**10(a): *US***



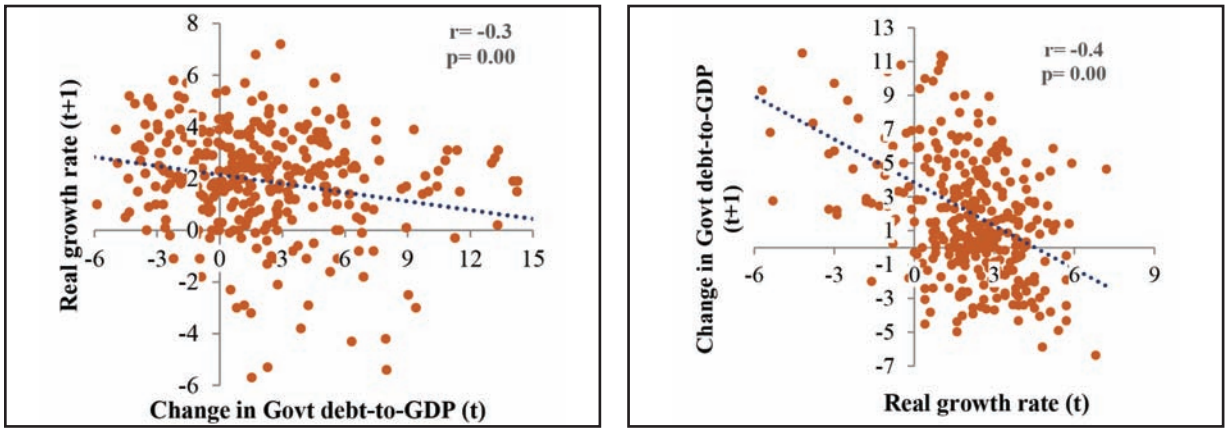

**10(b): *UK***




Source: IMF, World Bank
Notes: d: Change in General Government Debt as a per cent of GDP
r: Real interest rate; g: Real growth rate
Data on real interest for UK available upto 2014 with WB Data portal

2.17 Figure 11a shows the same time-series correlations as estimated for India above for the advanced economies – Canada, France, Germany, Greece, Italy, Spain, Japan, US and UK. These correlations are estimated by pooling the data for these countries over the last four decades. We notice that the correlation between real GDP growth rates and one-year-ahead change in general government debt-to-GDP levels is significantly negative. Similarly, the correlation between change in general government debt-to-GDP levels and one-year-ahead growth rates is also negative and statistically significant. Thus, unlike in the case of India, the time-series correlations do not suggest the direction of causality as both sets of correlations are statistically significant. This difference is extremely important to highlight because the implications for fiscal policy – especially during the current crisis – are starkly different for India when compared to policies that mimic those followed by advanced economies.

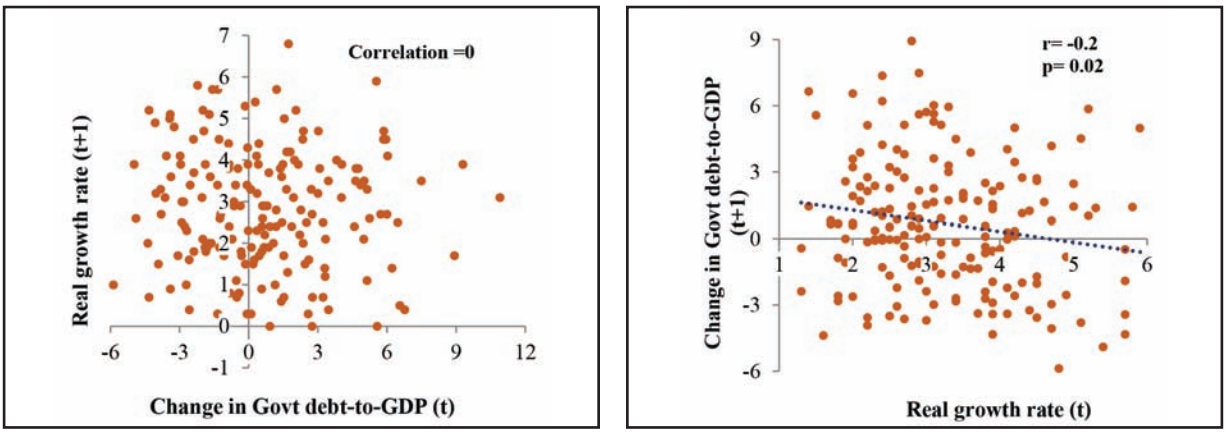
**Figure 11a: Unlike India, direction of causality between growth and debt cannot be inferred for the advanced economies**




Data on General Government that has been used. Countries include Canada, France, Germany, Greece, Italy, Spain, UK, USA, Japan
Source: IMF

2.18 However, when the above time-series correlations for the advanced economies is restricted to the high growth phases over the last two decades, i.e. growth greater than the average growth for the country over 1980-2018, the result is identical to that obtained for India. Specifically, higher growth leads to lower debt-to-GDP but not vice versa (Figure 11b). Of course, we see that the correlation from higher growth leads to lower debt-to-GDP is not very high, even though it is statistically significant, because the growth rates are not very high even during the high growth episodes in advanced economies. The inference remain clear that, even in the advanced economies where GDP growth has been significantly lower than that in a high growth country such as India, high growth phases lead to lowering of debt.

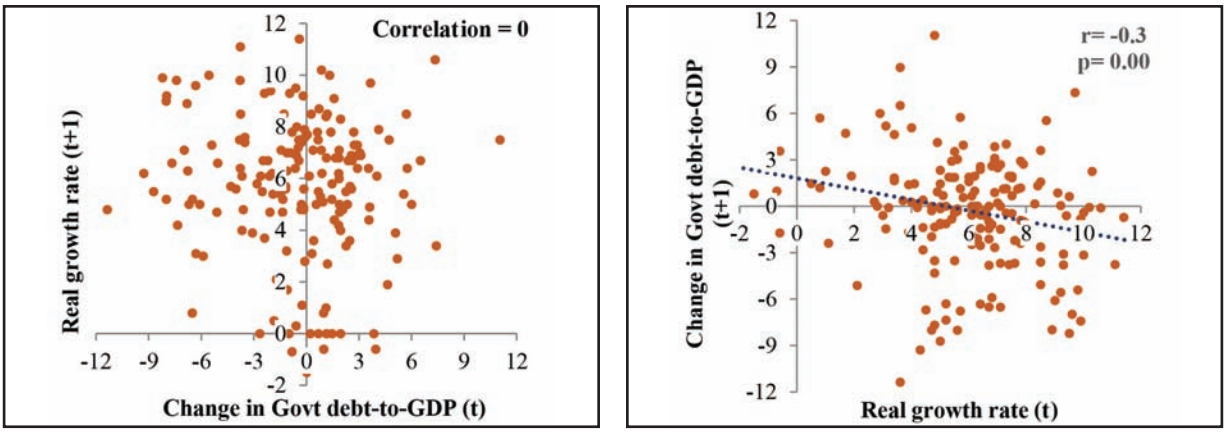
**Figure 11b: Direction of causality: Growth to Debt in high growth phases in advanced economies**




Data on General Government that has been used. Countries include Canada, France, Germany, Greece, Italy, Spain, UK, USA, Japan
Source: IMF

2.19 The evidence that the magnitude of GDP growth affects the direction of causality from growth to debt sustainability is buttressed by the evidence of this causal relationship for the all high growth EMEs put together, which include India, China, Indonesia, Malaysia, Thailand, Philippines, Vietnam and Turkey. Figure 12 shows that higher growth leads to lower debt-to-GDP ratios over the period 1980 to 2018 but not *vice versa*. This may be inferred from the statistically significant negative correlation observed between real growth rate and 1-year ahead change in general government debt-to-GDP, and statistically insignificant correlation between change in debt-to-GDP and one year ahead real growth rate.

**Figure 12: Direction of causality: Growth to Debt in high growth EMEs**




Data on General Government that has been used. Countries include India, China, Indonesia, Malaysia, Thailand, Philippines, Vietnam, Turkey

Based on availability of General Government debt data on IMF Debt database. The panel is unbalanced.

2.20 Thus, the evidence clearly points out that for countries growing their GDP at high rates, growth leads to lowering of their public debt as measured by their debt-to-GDP ratios but not vice versa. In contrast, when the GDP growth rate is low, no such causal relationship manifests between growth and public debt. This is seen through the following summary of the results demonstrated so far.

- For India and other EMEs, which have consistently grown their GDP at high rates over the last few decades, the relationship between debt and growth exhibits a clear direction of causality: Higher growth lowers debt-to-GDP ratios but lower debt does not necessarily lead to higher growth.
- The same phenomenon is obtained during the high growth phases for the advanced economies, which have otherwise grown at significantly lower GDP growth rates when compared to India and other EMEs.
- In contrast, across both the high and low growth episodes, in the advanced economies, where GDP growth rates have been low on average over the last few decades, this relationship does not manifest.
- A Granger causality test of this relationship for panel of advanced countries and EMEs including India, shows that while real GDP growth rate causes general government debt-to-GDP in EMEs, this relationship is not clearly seen in the advanced countries (see Box 6).

## Box 6: CAUSALITY TESTS ON PANEL DATA OF EMEs AND ADVANCED ECONOMIES

To confirm the direction of causality using formal statistical tests, pairwise Dumitrescu Hurlin Panel Causality Test was carried for the sample of EMEs and advanced economies. The test allows the coefficients to be different across countries. This test simply runs standard Granger Causality regressions for each cross-section individually. The lag order is assumed to be identical for all countries.

The test finds evidence of causality from Growth to Debt for the sample of EMEs. However, for the sample of Advanced countries, the test is not able to establish any causal relationship between Change in debt-to-GDP and growth.

**Sample 1- Emerging market Economies**

Time period: 1981-2018 (Unbalanced)

Countries: India, China, Indonesia, Malaysia, Thailand, Philippines, Vietnam, Turkey.

$H_0$: Real growth rate does not cause Change in Debt/GDP for all cross sections.

**Rejected at 5% level of significance**

$H_0$: Change in Debt/GDP does not cause Real growth rate for all cross sections.

**Not rejected**

Pairwise Dumitrescu Hurlin Panel Causality Tests
Date: 10/13/20 Time: 18:57
Sample: 1981 2018
Lags: 2

| Null Hypothesis: | W-Stat. | Zbar-Stat. | Prob. |
|---|---|---|---|
| REALG does not homogeneously cause DELD | 6.27806 | 3.47867 | 0.0005 |
| DELD does not homogeneously cause REALG | 1.86009 | -0.48300 | 0.6291 |

**Sample 2- Advanced economies**

Time period: 1981-2018

Countries: Canada, France, Germany, Greece, Italy, Spain, UK, USA, Japan

$H_0$: Real growth rate does not cause Change in Debt/GDP for all cross sections.

**Not rejected.**

$H_0$: Change in Debt/GDP does not cause Real growth rate for all cross sections.

**Not rejected.**

Pairwise Dumitrescu Hurlin Panel Causality Tests
Date: 10/13/20 Time: 18:49
Sample: 1981 2018
Lags: 2

| Null Hypothesis: | W-Stat. | Zbar-Stat. | Prob. |
|---|---|---|---|
| REALG does not homogeneously cause DELD | 2.98952 | 1.11521 | 0.2648 |
| DELD does not homogeneously cause REALG | 1.88412 | -0.33238 | 0.7396 |

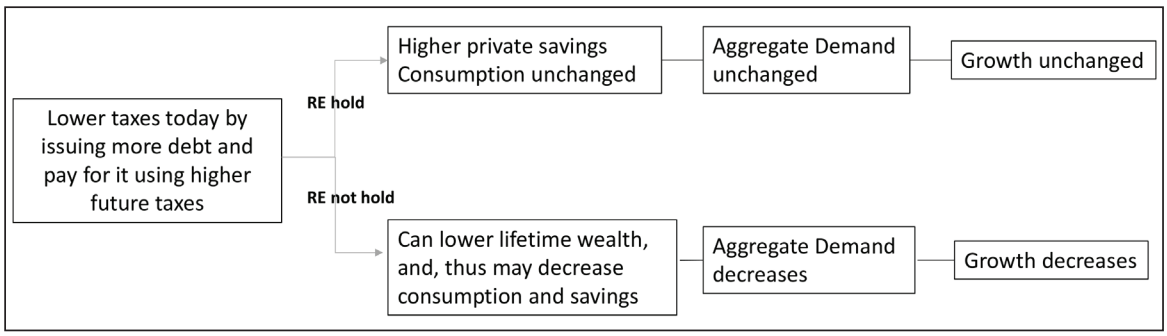
Data source: IMF

## CROWDING OUT DUE TO PUBLIC EXPENDITURE?

2.21 So far, we have established a clear direction of causality between growth and debt for countries where the growth rates are high; specifically, growth leads to debt sustainability and not vice versa in these countries. This direction of causality is, however, not clear in the case of countries where the growth rate is low. This is because higher growth enables the IRGD to be negative and thereby ensuring debt sustainability. We now examine the potential mechanisms that explain behind the causal effect from growth to debt sustainability and not vice versa for India.

2.22 Conceptually, the plausible link from higher incremental debt to lower growth rate is based on potential crowding out of private investment and the Ricardian Equivalence Proposition (REP). REP states that forward-looking consumers, who are also assumed to be

perfectly rational and perfectly capable, internalize the government's fiscal choices when making their consumption decisions. Specifically, for a given pattern of government spending, increases in government spending (or lowering of taxes) in the current period lead forward-looking consumers to anticipate future tax increases, thereby leading them to save in the current period to be able to pay for the future tax increases. As a result, aggregate demand remains unchanged in the current period (Barro, 1974, 1979). REP, however, breaks down in most economies because of the failure of the stringent assumptions – including lump-sum taxes – that are required for it to hold. When REP does not hold, for instance due to proportional taxes, higher public debt levels (lower public savings) may not be accompanied by increase in private savings, higher government spending (or lower taxes) in the current period may lead to lower national savings. This may put upward pressure on the interest rates, resulting in crowding out of investment and thus negatively impacting the growth rates. This section examines these mechanisms for India.




## Crowding Out?

2.23 The phenomenon of crowding out of private investment is based on the notion that supply of savings in the economy is fixed. Therefore, higher fiscal spending may increase the demand for loanable funds and hence exert an upward pressure on interest rates, thereby discouraging private investment (Blanchard, 2008).

2.24 However, for emerging economies such as India, an increase in public expenditure in areas that boost private sector's propensities to save and invest, may enable private investment rather than crowding it out. In other words, in an economy that has unemployed resources, an increase in government spending increases the aggregate demand in the economy, which may induce the private sector to increase their investment in new machinery to cater to the increased demand, and hence put the unused resources to productive uses. This may have multiplier effects on aggregate demand, resulting in higher growth rates (Eisner, 1994). In fact, if the public expenditure is directed to sectors where the fiscal multipliers are large – for instance for building infrastructure – such spending may significantly crowd in private investment as well.

2.25 Recent research puts further doubt on the phenomenon of crowding out in rapidly growing economies by showing that the supply of savings is not fixed but expands with

income growth. Sandri (2014) examines 62 episodes of growth spurts from 1960 to 2011 among non-OECD countries and shows that productivity growth across these episodes is combined with not only a rapidly rising investment rate but an even more steeply increasing savings rate. Carroll and Weil (1994), Attanasio, Picci and Scorcu (2000) and Rodrik (2000) show that savings and growth are not only positively correlated but their positive correlation is even stronger than that between growth and investment. Using a VAR framework, Kulkarni and Erickson (1995) find no statistically significant evidence of crowding out in India. Due to dynamic interdependencies between public investment and GDP, the literature has also resorted to using vector auto-regressions (VARs) to estimate the crowding out phenomenon. Mitra (2005) uses a structural VAR, and finds evidence that the impact of public investment on crowding out of private investment is less than one for one. These results broadly support the static, unconditional estimates provided below.

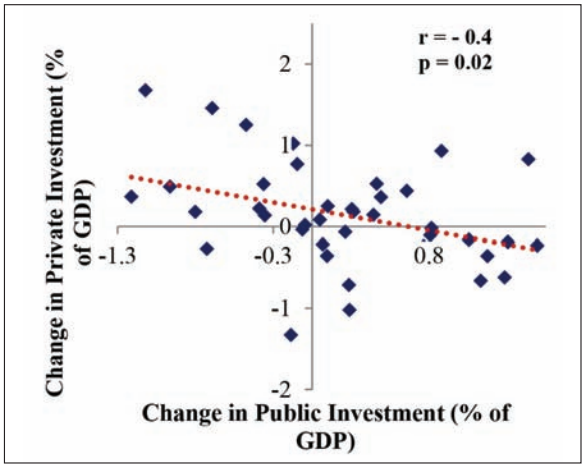
2.26 For a country such as India with an extremely young population, the role of demographics in fostering savings becomes crucial to understand possible crowding out due to government spending. Bosworth and Chowdorow-Reich (2007) show for Asia that both savings and investment rise with the proportion of the working population. Curtis, Lugauer and Mark (2011) find that jobs that pay meaningful wages drive savings rate in the economy. Lee, Mason and Miller (2000) and Bloom et al. (2007) show that savings increases as average life expectancy increases in a country. Thus, in an economy operating below full capacity, the supply of savings may grow from greater government spending through demand creation and thereby greater employment. This is because, as highlighted by recent research, favourable demographics – in the form of a large population of working age – would enhance savings through meaningful jobs.

2.27 Consistent with these arguments against crowding out, studies find no evidence of crowding out of private investment due to public investment for developing economies. Erden and Holcombe (2005) analyse the public and private investment in developing and developed economies, and conclude that while public investment is complementary to private investment in developing countries, the opposite holds for developed countries. Eisner (1994) argues that whether an increase in Government expenditure for goods and services 'crowds out' domestic private investment, may depend upon how close the economy is to full employment. Bahal et al. (2015) find no evidence of crowding out in India over the period 1980-2012.

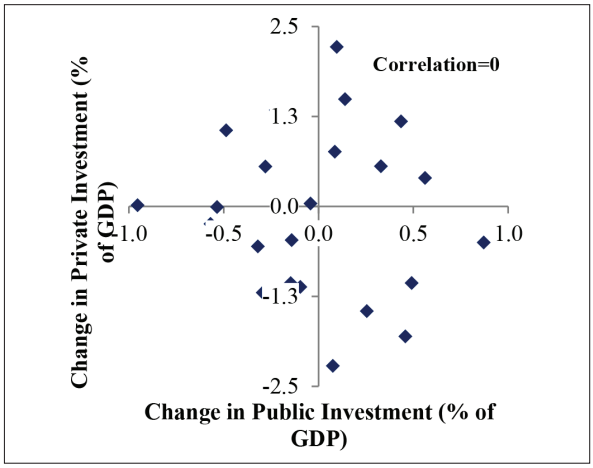
2.28 We analyse the relationship between changes in public investment and changes in private investment for the period FY 1991- FY 2019 and find the correlation to be insignificant (Figure 13b). Thus, consistent with the results in Bahal et al. (2015), we find no evidence of crowding out over the last three decades post liberalization. However, during the pre-liberalisation period of FY 1951-FY 1990, a negative correlation between changes in public investment and changes in private investment provides evidence consistent with the rationale of fixed loanable funds and possible crowding out (Figure 13a).

**Figure 13: Relationship between public investment and private investment**

**13a. FY 1951 to FY 1990**




**13b. FY 1991 to FY 2019**

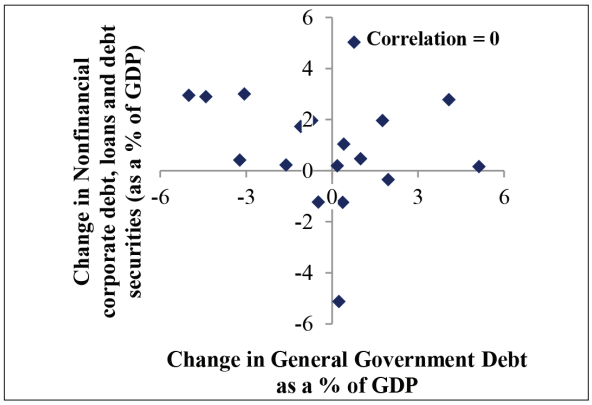



Source: MosPI
Investment and GDP upto FY2011 is 2004-05 series and from FY 2011 to FY 2019 is 2011-12 series

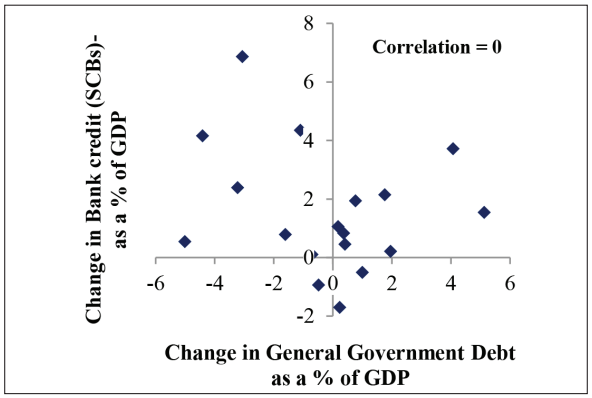
2.29 To examine the robustness of the above findings, we also analyse how non-financial corporate debt-to-GDP and bank credit change with changes in government debt-to-GDP. We find no evidence of crowding out during FY 2001 and FY 2019, indicated by no correlation between the two sets of variables (Figure 14).

**Figure 14: Does higher government debt lead to lower corporate debt over FY2001 to FY 2019?**

**14a: Relationship between change in government debt and change in corporate debt**




**14b: Relationship between change in government debt and change bank credit**

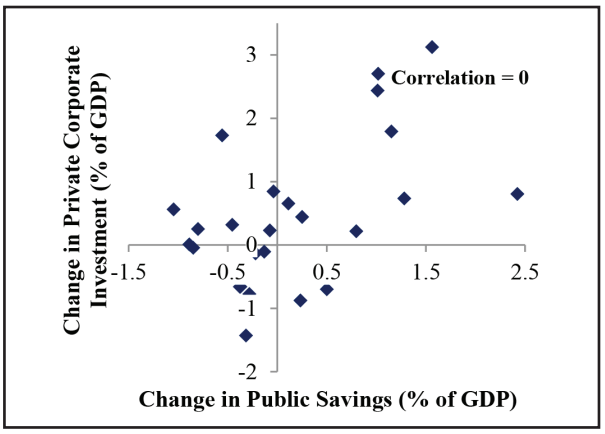



Source: RBI, IMF, MosPI

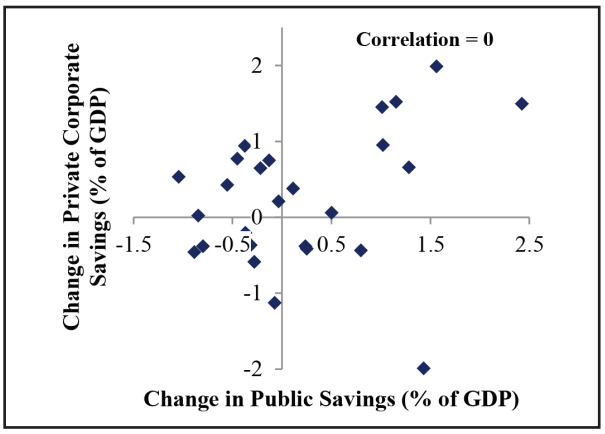
2.30 Similarly, we find no correlation between public sector savings and private investments by the corporate sector or between public sector savings and private savings by the corporate sector for the period FY1991 to FY2019 (Figure 15).

**Figure 15: No evidence of crowding out through savings channel (FY 1991- FY 2019)**

**15a: Correlation between change in Public Sector Savings with 1 year ahead change in Private Corporate Investment**




**15b: Correlation between change in Public Sector Savings with 1 year ahead change in Private Corporate Savings**



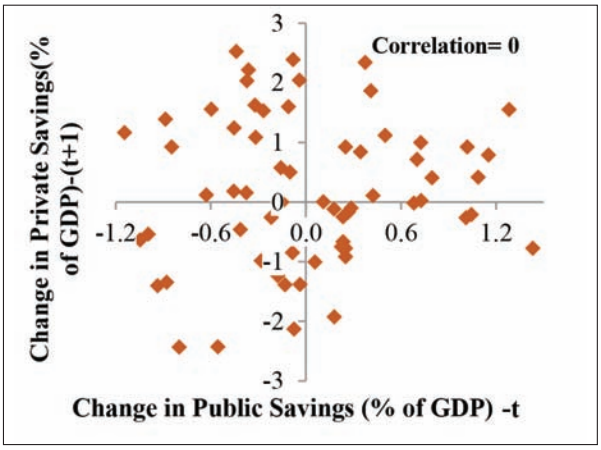

Source: MosPI
Savings, Investments and GDP upto FY2011 is 2004-05 series and from FY 2011 to FY 2019 is 2011-12 series

2.31 We also examine whether REP holds in the Indian context. Note that the validity of REP rests on a number of assumptions including (i) the representative citizen pays taxes; (ii) taxes are non-distortionary and are collected as a lump-sum; (iii) perfect capital markets with no borrowing constraints; (iv) future flows of income and future tax liabilities are certain; (v) representative citizen is infinite living, rational and forward looking. Numerous studies have found that REP does not hold in developing countries (see Haque and Montiel (1989), Khalid 1996). Leiderman and Blejer (1988) discuss the various channels that lead to possible deviations from the assumptions underlying REP. Ghatak & Ghatak (1996) test REP for the years 1950-1986 for India and find that REP does not hold in the Indian context.

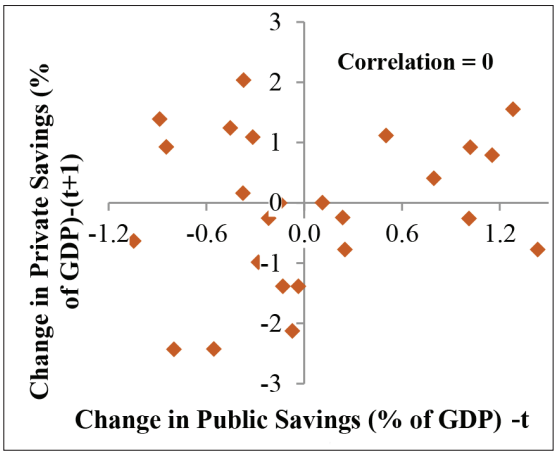
2.32 We examine the validity of REP for India for the time periods 1950-2019 and 1990-2019. Figure 16 exhibits that there is no significant correlation between change in public savings and 1-year ahead change in public savings for India for various time durations over the last 70 years. The variable 'change in private savings' is taken with a 1-year lead to factor in adaptive consumer expectations as the representative consumer may not immediately alter his savings behaviour in response to the government's budget announcements. The results remain similar when contemporaneous correlations are examined between these two variables.

**Figure 16: Correlations between change in public Savings and 1 year ahead change in Private savings**

**16a. FY 1951 – FY 2019**




**16b. FY 1991 – FY 2019**

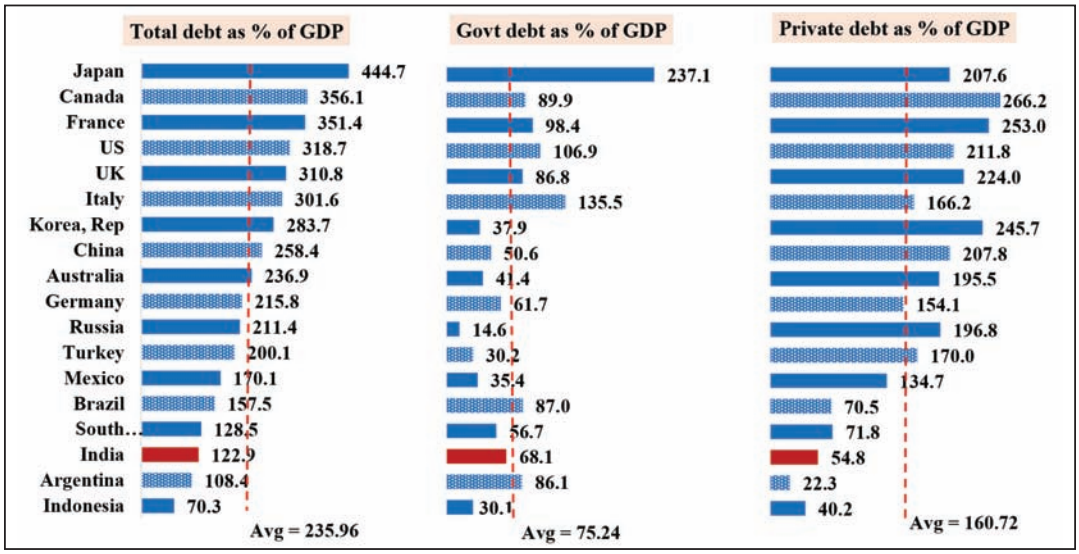



Source:MoSPI

## STRUCTURE OF INDIA'S DEBT

2.33 After analyzing the key parameters of debt dynamics and their implications, it is imperative to understand the structure and characteristics of India's public debt. India's public debt-to-GDP has been significantly low compared to high global debt levels (Figure 17). A cross-country comparison of debt levels points out that for India, the government debt level as a proportion of GDP is equal to the median in the group of G-20 OECD countries and in the group of BRICS nations. India's overall debt levels as a per cent of GDP are the lowest amongst the group of G-20 OECD countries and also among the group of BRICS nations (Figure 18). Moreover, public debt and overall debt level for India has declined since 2003 and has been stable since 2011.

**Figure 17: Debt-to-GDP ratio for India amongst the Rest of the world (2018)**

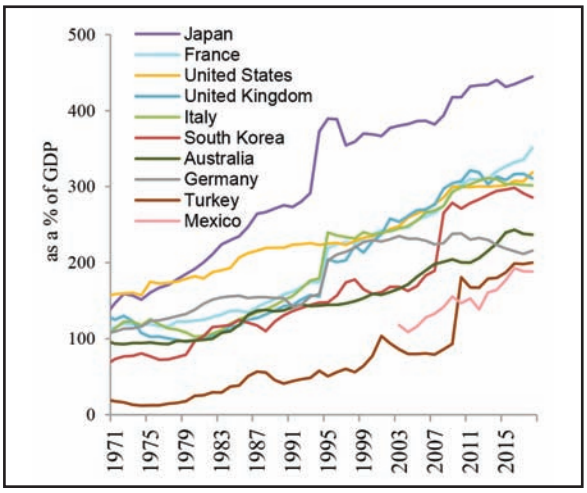



Source: IMF Debt database

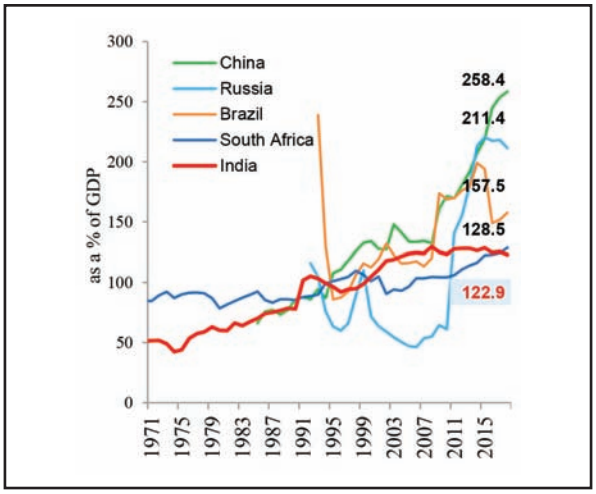
Private Debt Data: Japan, Canada, France, US, UK, Italy, Korea, Germany, Russia, Turkey, Mexico report Private debt for all instruments, and the remaining countries in the sample report Private debt (loans and debt securities). Private debt data for Turkey and Mexico is for 2017. General Government debt data is used except for Korea, South Africa, Argentina where Central Government debt has been used.

**Figure: 18: Trends in debt-to- GDP for India vis-à-vis other countries**

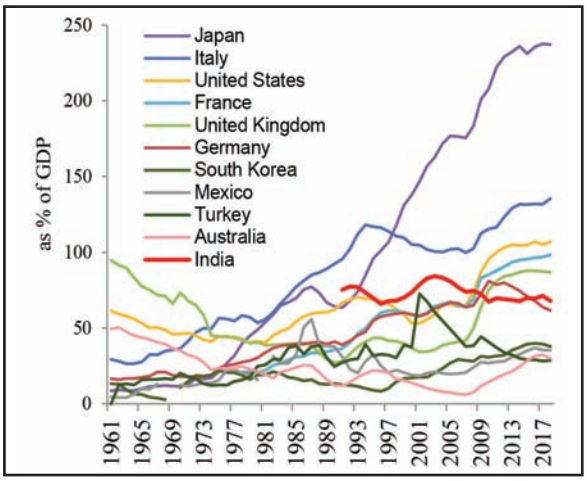
**18a. India lowest among G-20 OECD countries using Total Debt as per cent of GDP**



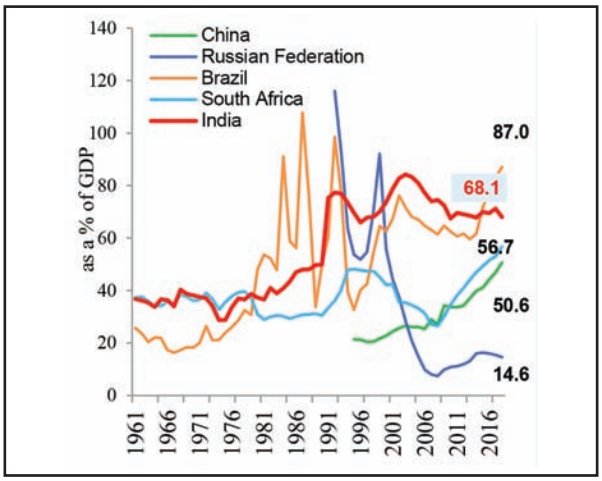

**18b. India lowest among G-20 BRICS countries using Total Debt as per cent of GDP**




**18c. India at median using Govt Debt as a per cent of GDP for G-20 OECD countries**




**18d. India at median using Govt Debt as a per cent of GDP for G-20 BRICS countries**




Source: IMF.

2.34 The Government's debt portfolio is characterized by very low foreign exchange risk as the external debt is only 2.7 per cent of GDP ( 5.9 per cent of total Central Government liabilities) (Figure 20). Of the total public debt, 70 per cent is held by the Centre (Figure 19). As the central government is entrusted with the responsibility of macro-economic management, this distribution of debt between the centre and states is desirable because of the incentive compatibility that it generates. The long maturity profile of India's public debt (issuance of longer tenure bonds) along with a small share of floating rate debt (floating rate debt of Central Government is less than 5 per cent of public debt) tends to limit rollover risks, and insulates the debt portfolio from interest rate volatility (Figure 21 and 22).[2]

[2] Source: Status Paper on Government Debt, Department of Economic Affairs, Ministry of Finance, April 2020.

**Figure 19: Composition of General Government public debt**

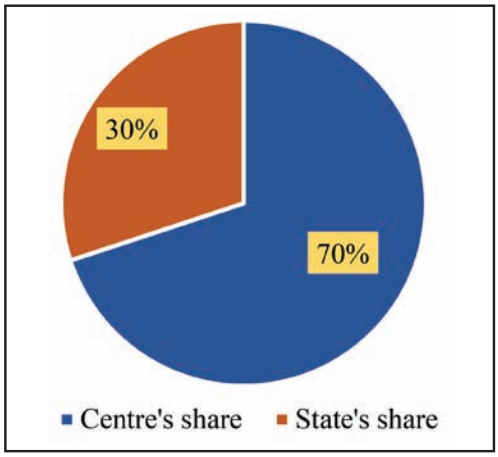



**Figure 20: Composition of Central Govt. debt**

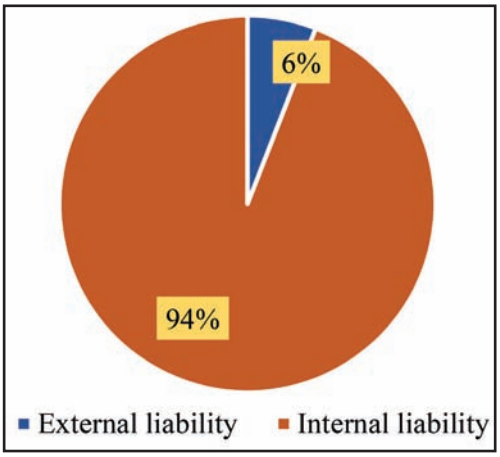



**Figure 21: Maturity Profile of dated Central Government securities (per cent of total)**

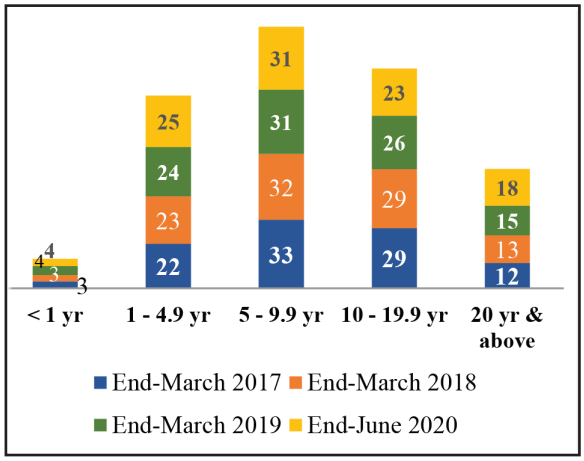
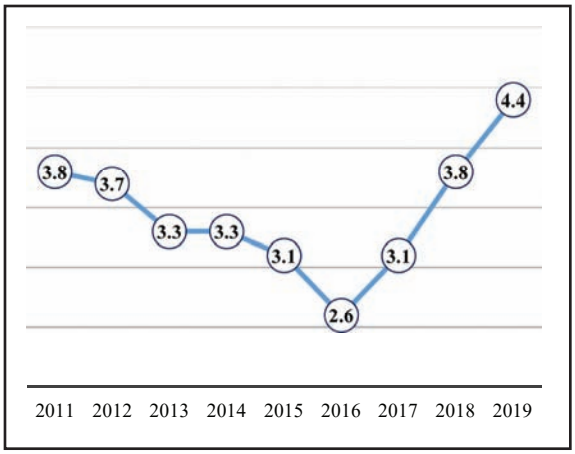



**Figure 22: Total floating rate debt of Central Government as a per cent of Public debt**




Source: Quarterly Report on Public Debt Management and Status Paper on Government Debt, Department of Economic Affairs, Ministry of Finance.

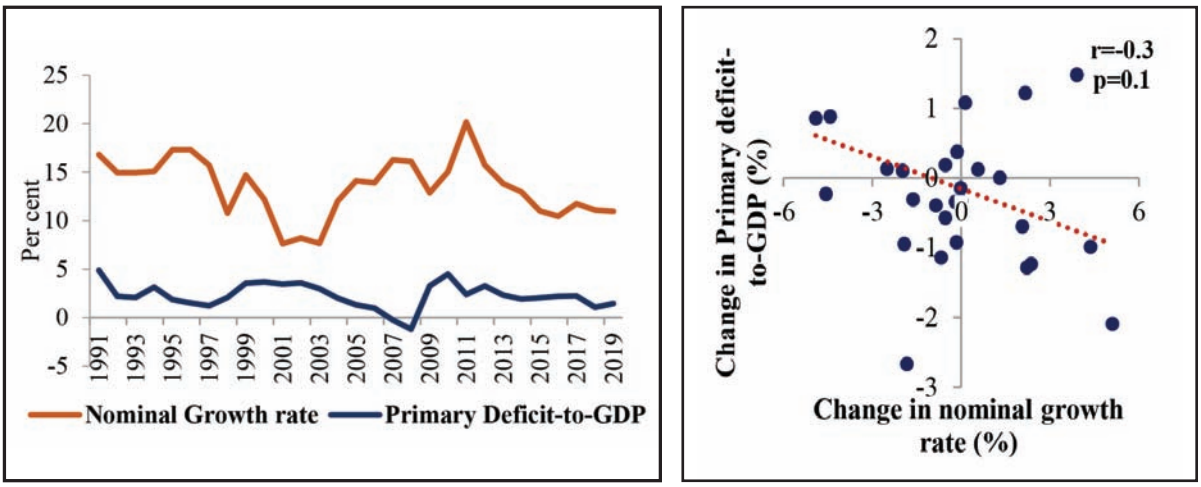
## SCENARIO ANALYSIS: IS INDIA'S CURRENT DEBT SUSTAINABLE?

2.35 We evaluate the sustainability of India's debt in this section through macroeconomic scenario-based simulations (to account for various worst case scenarios). To ensure debt sustainability, i.e. $d_t<d_{t-1}$, we use the identity for debt dynamics explained in Box 3. By denoting negative primary balances as primary deficit (pd), we get:

$$d_t < d_{t-1} \Leftrightarrow pd_t < (\gamma_t - i_t)\cdot d_{t-1}/(1+\gamma_t)$$

2.36 Thus, as long as the primary deficit is less than a maximum threshold, debt would remain sustainable. Note that the above inequality does not capture the fact that the primary deficit itself decreases with higher growth rate as seen in Figure 23. This is understandable as tax revenues increase with higher growth and thereby bring down the primary deficit. The decline in the primary deficit with growth increases the likelihood that the above inequality gets satisfied. This is because the right-hand-side of the inequality increases with growth and the left-hand-side of the inequality (pd) decreases with growth.

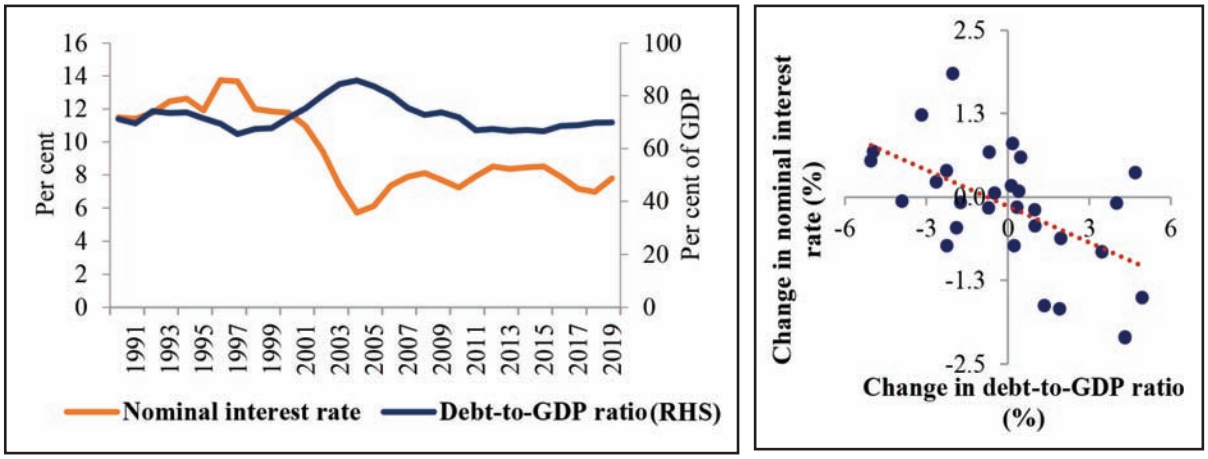
**Figure 23: Primary deficit-to-GDP declines with higher nominal growth**




Source: RBI, MoSPI.

2.37 Before undertaking the scenario analysis, it is important to examine the drivers for the nominal interest rate. If crowding out of private sector investment were the key phenomenon at play, an increase in the general government debt-to-GDP would increase the interest rate. However, Figure 24 below shows that an increase in the general government debt-to-GDP correlates with lower (not higher) nominal interest rates. This is, in fact, consistent with the evidence against the presence of crowding out demonstrated in Section V above.

**Figure 24: A higher debt-to-GDP ratio correlates with lower (not higher) nominal interest rates[3]**




Source: RBI

2.38 As discussed in the previous sections of this Chapter, negative IRGD plays a pivotal role in ensuring debt sustainability. To project the IRGD forward, we first have to estimate the interest rate that are expected to prevail going forward. In the last three decades, we observe a strong negative correlation between debt-to-GDP ratio and nominal interest rates in India (Figure 24). Further, as Figure 25 clearly shows, the 5-year forward interest rates for all maturities (1 year, 5 years, 10 years, 20 years and 30 years) have been trending down sharply over the last decade. Even the 10-year rate give years forward, which is the maximum among all the 5-year

[3] Nominal interest rate used is the annual weighted average interest rate on Central Government securities (published by RBI)

forward rates, is less than 7.5 per cent. Assuming the lower range in the inflation target of 4 per cent, this implies that even with a real growth rate of 3.4 per cent over the next five years, the IRGD is highly likely to be negative going forward. In fact, as the average rate of government borrowing is a weighted average of the rates over various maturities, the cost of borrowing is likely to be significantly lower. Therefore, the IRGD is very likely to be negative for India in a 5-year horizon.

**Figure 25a: Trends in 5-year Forward Rates For Different Maturities**

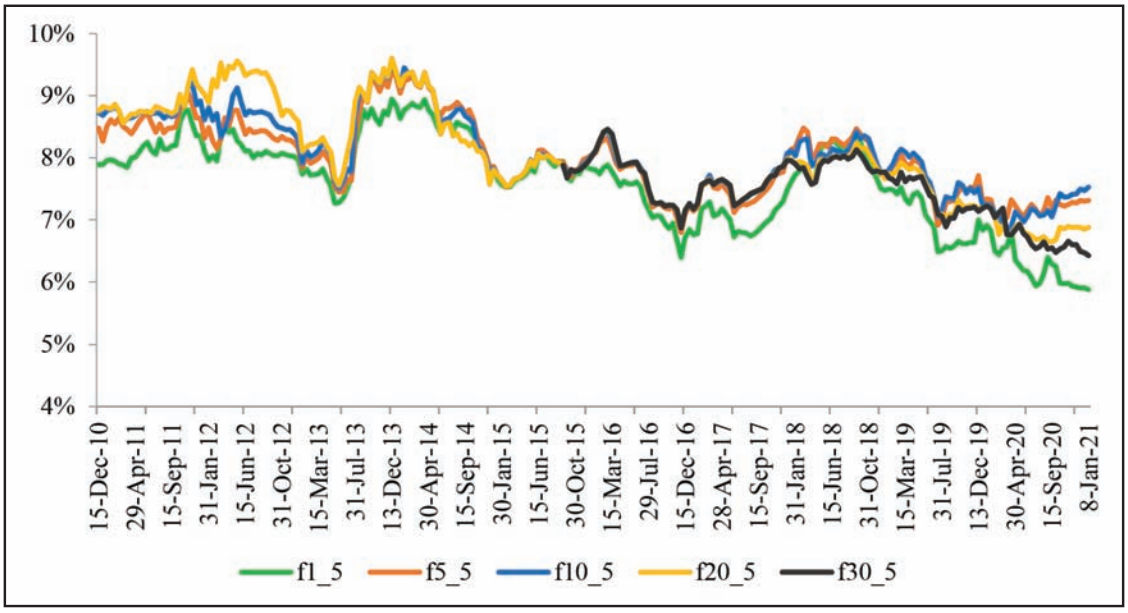
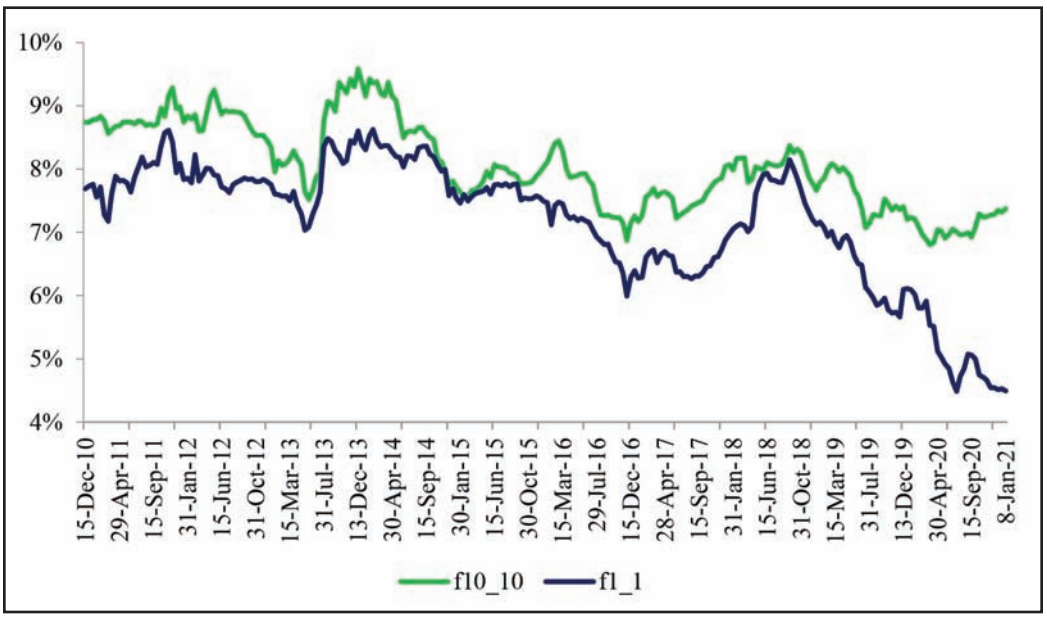



**Figure 25b: Trends in forward rates for different maturities**




Source: ZCYC data has been taken from CCIL at fortnightly frequency for the past 10 years
Notes: f1_5 denotes 5-yr forward rate of bonds with 1-yr maturity period.

2.39 Note that while estimating the expected interest rates going forward using the forward rates, the endogenous role of monetary policy is not being accounted for. Specifically, since monetary policy is endogenous, low growth is likely to be accompanied by expansionary monetary policy and lower financing costs. Thus, in the forward-looking analysis, the beneficial impact of monetary policy on IRGD must be factored in. As a result, even in the worst-case scenario where growth is anaemic over the medium-term, its impact on debt sustainably gets moderated by supportive monetary policy. Thus, even in the extremely worst case scenarios, IRGD is expected to remain negative for India, thereby ensuring sustainability of debt. We therefore do the scenario analysis factoring in the highly likely negative IRGD in the steady state (Figure 26).

## Box 7: Assumptions for Debt simulations

The debt simulations for worst-case debt analysis are based on the following assumptions:

(i) Real growth rate for FY21 is taken as -7.7 per cent (MoSPI) and real growth rate for FY22 is assumed as 11.5 per cent based on IMF estimates.

(ii) General Government debt for FY20 is taken as 73.8 per cent of GDP (Revised Estimates from RBI)[4]

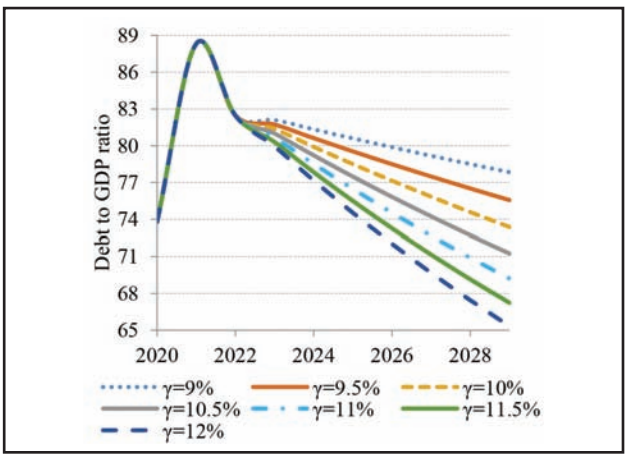
(iii) The primary deficit (Centre + States) for FY21 is assumed to be 6.8 per cent of GDP. This equals 1.3 per cent of GDP as baseline PD (0.4 per cent Centre + 0.9 per cent States) + 5.5 per cent of GDP increase both due to revenue shortfalls and the Atmanirbhar Bharat Package. Primary deficit for FY22 is assumed to be 2.5 per cent of GDP. The declining trajectory of primary deficit is assumed to reach 1.5 per cent of GDP (0.2 per cent Centre PD + 0.5 per cent States PD + 0.8 per cent EBR) by FY24, and it is assumed to stay at 1.5 per cent thereafter. This is inclusive of EBR.

(iv) Nominal interest rate is assumed to be 6 per cent. As on 26 January 2021, we estimate the weighted average cost of borrowing using the weights of General Government borrowing across maturities to be 6 per cent.

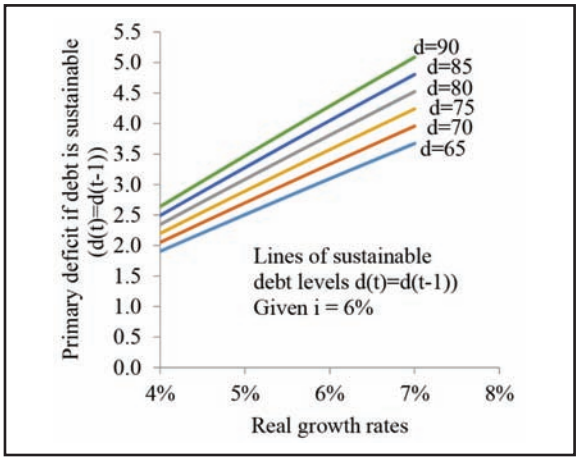
(v) Inflation is taken as 5 per cent, i.e. mid-point of the range of 4 per cent – 6 per cent.

**Figure 26: Simulations of the worst case Debt Dynamics**

**26a. Debt-to-GDP is sustainable in worst case in FY29**

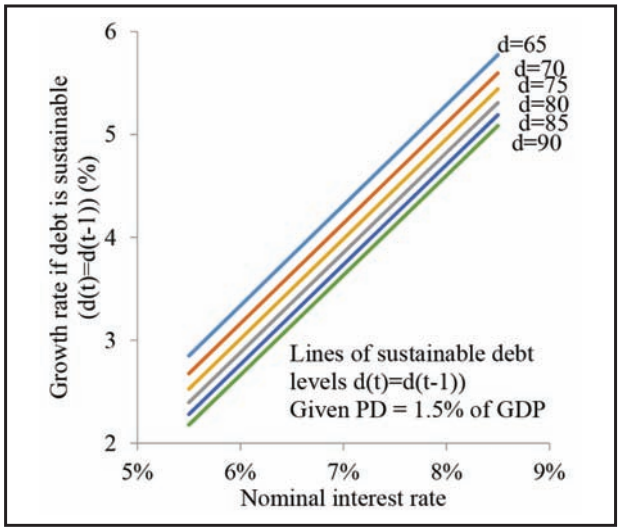



**26b. Maximum primary deficit from FY22 below which debt remains sustainable**

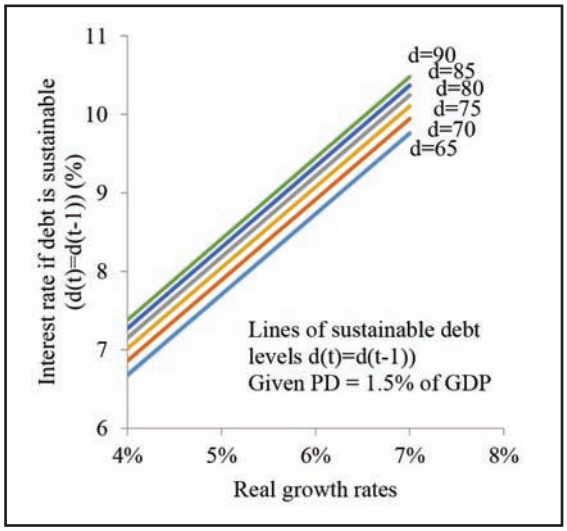



[4] Revised Estimate of General Government liabilities is taken as per cent of Provisional Estimate of GDP for FY 2019-20.

**26c. Minimum real growth rate from FY22, above which debt is sustainable**




**26d. Maximum interest rate from FY 22, below which debt is sustainable**




Source: RBI, MoSPI, Survey Estimates
Note: γ: nominal growth rate
Figure 31 c and 31 d show that for a given level of sustainable debt, the IRGD will remain negative

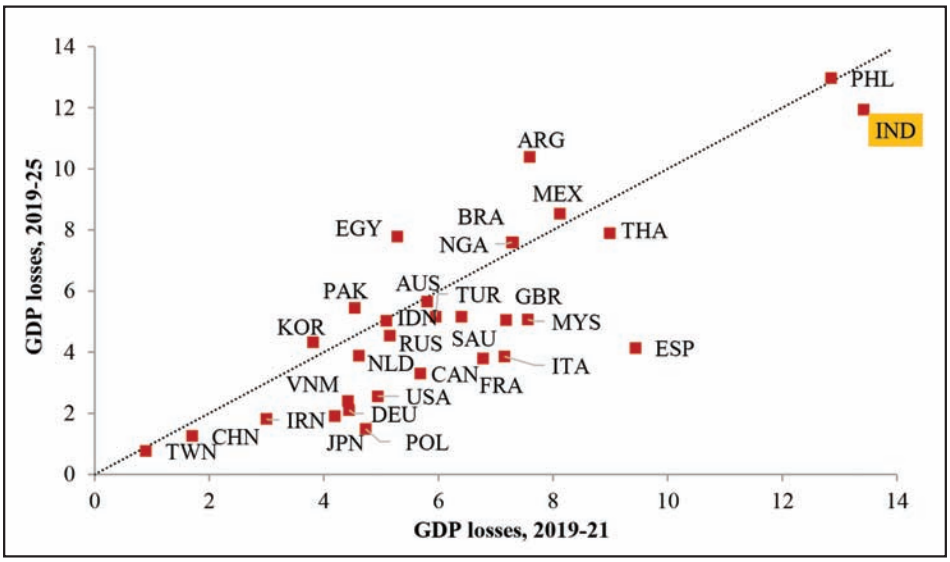
2.40 The results depicted in Figure 26a suggest that in a worst case scenario where the real growth is only 4 per cent in the next 10 years, public debt is sustainable. The results in Figure 26b-d also show that even at high primary deficits, low real growth and high nominal interest rates, India's debt will remain sustainable.

## POLICY IMPLICATIONS

2.41 As argued above, the COVID-19 pandemic has created a significant negative shock to demand. The various costs of financial distress that firms face even before potential bankruptcy (Andrade and Kaplan (1998), Hotchkiss et al. (2008), Senbet and Wang (2010)) combined with possible firm bankruptcies in a choked bankruptcy system, on the one hand, and the possibility that jobs lost during the lockdown may not get fully retrieved, on the other hand, create the possibility of economic hysteresis that must be avoided at all costs. The World Economic Outlook (October 2020) edition highlights this in the case of India (see Figure 27). To eliminate the possibility of growth being impacted in the medium to long run, the Government has been extremely pro-active in launching several seminal reforms. However, their impact will manifest in the medium to long-term. To ensure that the economy remains in good health to avail the full benefit of these significant reforms, the "economic bridge" to the medium and long-term has to be created. Only an active fiscal policy – one that recognises that the risks from doing too little are much more than the risks from doing too much – can ensure that this "economic bridge" is well laid out.

2.42 Central to this change in policy stance is the recognition that if we apply the old framework to today's reality, if we fail to stimulate the economy, we risk the temporary weakness in demand leading to lower potential growth (Blanchard et al. 2015). With the IRGD expected to be significantly negative for India in the foreseeable future, pro-cyclical fiscal policies may lead to higher, not lower, debt/GDP ratios.

**Figure 27: Potential for long-term impact of COVID-19 crisis on growth**




Source: IMF World Economic Outlook, October 2020

## Box 8: Fiscal rules for counter-cyclical fiscal policy

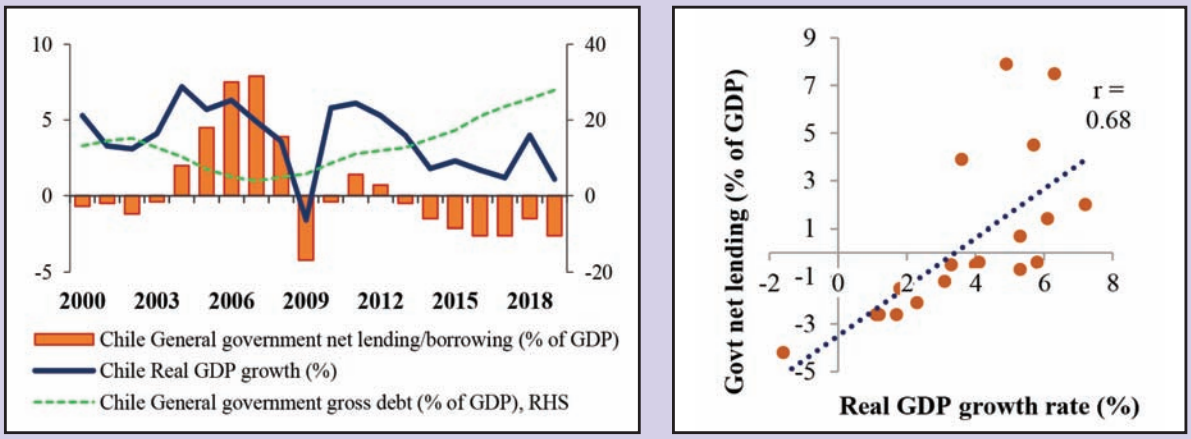
Fiscal rules are quantitative targets with respect to budgetary aggregates such as deficits, debt, expenditure or revenue, which impose a long-lasting constraint on the fiscal policy. Broadly they are referred to as "budgetary institutions" (Alesina and Perotti, 1999), i.e. a set of rules and regulations according to which budgets are prepared, approved and implemented. As per IMF, 78 countries had adopted some form of national fiscal rule by the year 2015, as part of the significant reforms in the fiscal framework. However, it is important to be cautious since some of these rules may entail a pro-cyclical stance in bad economic times.

In this context, the Chilean experience with fiscal rules that enable counter-cyclical fiscal policy provides important learnings. In 2000, Chilean Government adopted the structural surplus rule that targeted the overall central government's structural balance to be a surplus of 1 per cent of GDP every year. This target was subsequently revised to 0.5 per cent of GDP in 2007, and further to a simple balanced budget in 2009 (when the debt was almost paid off). Unlike the effective budget balance, which indicates the current fiscal position, structural balance reflects the medium-term fiscal outlook. The structural balance for Chile is estimated in the budget using forward-looking estimates of potential GDP and copper prices (since copper is the key driver of revenue in Chile-the largest exporter of copper). It therefore gives an estimate for the total maximum spending level allowed in the budget for the year. If the economy grows at a rate higher than the estimated potential GDP or if there is an increase in the copper prices over the medium term, more revenues are collected. However, since the government expenditure is capped for the fiscal year, the Government runs a surplus during economic booms. Similarly, in years when the output and revenues are below potential, the government runs a deficit since the fiscal rule does not allow spending cuts. Thus, the Chilean rule allows the automatic stabilizers to operate, and the overall budget balance to adjust with the state of the economy. This would thereby imply that with economic growth, the debt-to-GDP ratio should gradually fall.

The Chilean economy has benefited hugely from this budget rule, as the national savings rose from 20.6 per cent to 23.6 per cent between 2000 and 2005, leading to a sharp fall in central

government debt-to GDP ratio and improved sovereign debt ratings (Frankel, 2011). During the copper boom of 2003-2008, despite high copper prices leading to higher export earnings and economic growth, counter cyclical fiscal policy led to a budget surplus of almost 8 per cent and government debt reducing to mere 4 per cent of GDP. During the subsequent phase of Global recession when the copper prices had fallen, the government adopted unprecedented expansionary policy (using the surpluses accumulated during the copper boom) to mitigate the effects of the crisis (budget deficit crossed 4 per cent of GDP).

**Figure 28: Counter-cyclical fiscal policy by Government of Chile (2000 to 2019)**




Source: IMF

The strength of fiscal rules based upon potential GDP however, depends on the accuracy of estimated potential GDP. When potential GDP is estimated accurately, a structural balance rule ensures a counter-cyclical fiscal policy and leads to a gradual reduction in the debt-to-GDP ratio.

2.43 During economic crises, a well-designed expansionary fiscal policy stance can contribute to better economic outcomes in two ways. First, it can boost potential growth with multi-year public investment packages that raise productivity. The multi-year nature of public investment would contribute to credibly lifting growth expectations. With the National Infrastructure Pipeline (NIP) already laying out the agenda for ambitious public spending, fiscal policy catering to funding NIP in the first few years can boost growth and thereby be self-financing (DeLong and Summers, 2012). At a time of excessive risk aversion in the private sector, which is characteristic of any economic crisis, risk taking via public investment can catalyse private investment and unleash a virtuous circle. It will crowd in private investment, rather than crowd it out. Second, there is a risk of the Indian economy falling into a low wage-growth trap, as has happened in Japan during the last two decades. Implementing the NIP via front-ended fiscal spending could generate higher-paying jobs and boost productivity.

2.44 The experience of Chile in implementing fiscal rules that enable counter-cyclical fiscal policy is quite informative in this context (see Box 8 for details). As estimation of potential growth can become challenging to implement such fiscal rules, it would be practical in the Indian context to frame fiscal rules so as to allow space for fiscal policy to respond to slowdowns in growth. The National Bureau of Economic Research (NBER) defines a recession in the United States as two consecutive quarters of decline in GDP. Given the average growth and the standard deviation of growth in the United States, negative growth corresponds to a 1.5 standard deviation decline in growth. Similarly, a 1.65 standard deviation decline in growth, would *a priori* manifest once in ten quarters or with a probability of 10 per cent, equals 3.5 per cent.

Therefore, a practical fiscal rule should provide wriggle room for fiscal policy to be counter-cyclical by setting the trigger as a two-quarter slowdown in GDP growth of 3.5 per cent when compared to the average GDP growth over the previous 20 quarters (2/20 = 10 per cent). As the average and standard deviation of growth may change over time, this trigger of 3.5 per cent decline can be reviewed periodically say every five years.

2.45 A counterargument by critics – Paul Krugman's "deficit scolds"[5] – may be that governments have a natural tendency to spend. So, does the Survey give them arguments to misbehave? This represents an incorrect interpretation of the Survey findings. The right interpretation is not to pretend that debt is catastrophic if it is not. The Survey's effort is thus to provide the intellectual anchor for the government to be more relaxed about debt during a time of economic crisis such as the one we are witnessing. Thus, the Survey's call for a more active, counter-cyclical fiscal policy is not a call for fiscal irresponsibility. It is a call to break the intellectual anchoring that has created an asymmetric bias against fiscal policy. Once growth picks up in a sustainable manner, it will be the time for fiscal consolidation. But, for now, fiscal policy will have to remain centre-stage to support growth in the foreseeable future.

## CHAPTER AT A GLANCE

- This Chapter establishes clearly that growth leads to debt sustainability in the Indian context but not necessarily vice-versa. This is because the interest rate on debt paid by the Indian government has been less than India's growth rate by norm, not by exception. As Blanchard (2019) explains in his 2019 Presidential Address to the American Economic Association: "If the interest rate paid by the government is less than the growth rate, then the intertemporal budget constraint facing the government no longer binds." This phenomenon highlights that debt sustainability depends on the "interest rate growth rate differential" (IRGD), i.e. the difference between the interest rate and the growth rate in an economy.
- In advanced economies, the extremely low interest rates, which have led to negative IRGD, on the one hand, and have placed limitations on monetary policy, on the other hand, have caused a rethink of the role of fiscal policy. The same phenomenon of a negative IRGD in India – not due to lower interest rates but much higher growth rates – must prompt a debate on the saliency of fiscal policy, especially during growth slowdowns and economic crises.
- The confusion about causality – from growth to debt sustainability or vice-versa – is typical of several macro-economic phenomena, where natural experiments to identify causality are uncommon. In the specific context of growth and debt sustainability, this confusion also stems from the fact that the academic and policy literature focuses primarily on advanced economies, where causality is entangled by lower potential growth when compared to India. Indeed, the chapter studies the evidence across several countries to show that growth causes debt to become sustainable in countries with higher growth rates; such clarity about the causal direction is not witnessed in countries with lower growth rates. By integrating ideas from Corporate Finance into the macro-economics of Government debt a la Bolton (2016), the Survey lays the conceptual foundations to understand why these differences can manifest between high-growth emerging economies and low-growth advanced economies.

[5] https://www.nytimes.com/2016/07/11/opinion/cheap-money-talks.html

- As the COVID-19 pandemic has created a significant negative shock to demand, active fiscal policy – one that recognises that fiscal multipliers are disproportionately higher during economic crises than during economic booms – can ensure that the full benefit of seminal economic reforms is reaped by limiting potential damage to productive capacity. As the IRGD is expected to be negative in the foreseeable future, a fiscal policy that provides an impetus to growth will lead to lower, not higher, debt-to-GDP ratios. In fact, simulations undertaken till 2030 highlight that given India's growth potential, debt sustainability is unlikely to be a problem even in the worst scenarios. The chapter thus demonstrates the desirability of using counter-cyclical fiscal policy to enable growth during economic downturns.

- While acknowledging the counterargument from critics that governments may have a natural proclivity to spend, the Survey endeavours to provide the intellectual anchor for the government to be more relaxed about debt and fiscal spending during a growth slowdown or an economic crisis. The Survey's call for more active, counter-cyclical fiscal policy is not a call for fiscal irresponsibility. It is a call to break the intellectual anchoring that has created an asymmetric bias against fiscal policy.

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# Does India's Sovereign Credit Rating reflect its fundamentals No!

**03**
**CHAPTER**

চিত্ত যেথা ভয়শূন্য, উচ্চ যেথা শির...
ভারতেরে সেই স্বর্গে করো জাগরিত।

**"Where the mind is without fear and the head is held high …**
**Into that heaven of freedom, my Father, let my country awake".**

**— Rabindranath Thakur**

*Never in the history of sovereign credit ratings has the fifth largest economy in the world been rated as the lowest rung of the investment grade (BBB-/Baa3). Reflecting the economic size and thereby the ability to repay debt, the fifth largest economy has been predominantly rated AAA. China and India are the only exceptions to this rule – China was rated A-/A2 in 2005 and now India is rated BBB-/Baa3. Do the fundamentals that supposedly drive sovereign credit ratings rationalise this historical anomaly? In this chapter, the Survey asks this important question and answers a resounding No!*

*Within its sovereign credit ratings cohort – countries rated between A+/A1 and BBB-/Baa3 for S&P/ Moody's – India is a clear outlier on several parameters, i.e. a sovereign whose rating is significantly lower than mandated by the effect on the sovereign rating of the parameter. These include GDP growth rate, inflation, general government debt (as per cent of GDP), cyclically adjusted primary balance (as per cent of potential GDP), current account balance (as per cent of GDP), political stability, rule of law, control of corruption, investor protection, ease of doing business, short-term external debt (as per cent of reserves), reserve adequacy ratio and sovereign default history. The outlier status remains true not only now but also during the last two decades.*

*Credit ratings map the probability of default and therefore reflect the willingness and ability of borrower to meet its obligations. India's willingness to pay is unquestionably demonstrated through its zero sovereign default history. India's ability to pay can be gauged not only by the extremely low foreign currency denominated debt of the sovereign but also by the comfortable size of its foreign exchange reserves that can pay for the short term debt of the private sector as well as the entire stock of India's external debt including that of the private sector. India's non-government short term-debt as per cent of forex reserves stood at 19 per cent as of September 2020. India's forex reserves can cover an additional 2.8 standard deviation negative event, i.e. an event that can be expected to manifest with a probability of less than 0.1 per cent after meeting all short-term debt. India's forex reserves stood at US$ 584.24 as of January 15, 2021, greater than India's*

*total external debt (including that of the private sector) of US$ 556.2 bn as of September 2020. In corporate finance parlance, therefore, India resembles a firm that has negative debt, whose probability of default is zero by definition. Despite this compelling statistic, India is an inexplicable outlier in its ratings cohort. The Survey's findings are consistent with a large academic literature that highlights bias and subjectivity in sovereign credit ratings, especially against countries with lower ratings.*

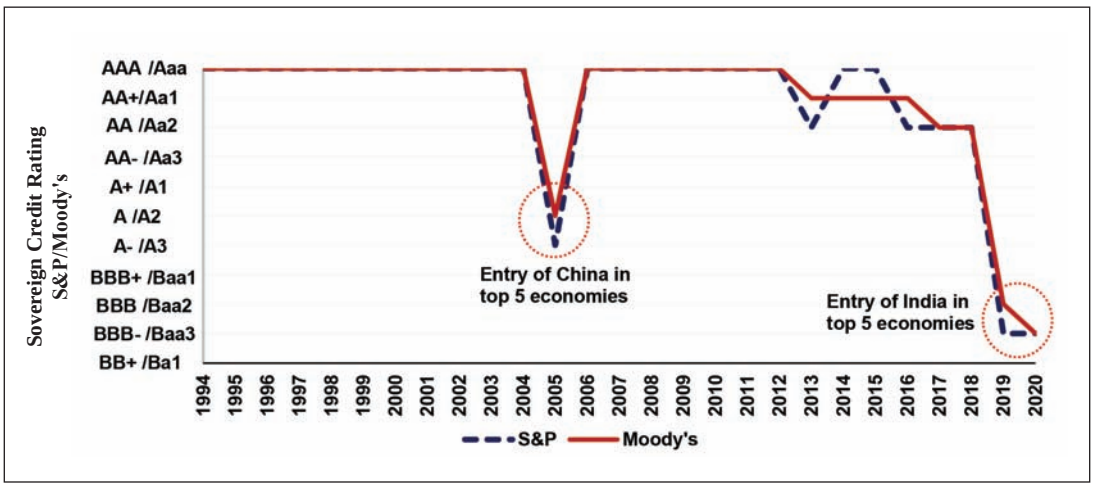
*As ratings do not capture India's fundamentals, it comes as no surprise that past episodes of sovereign credit rating changes for India have not had major adverse impact on select indicators such as Sensex return, foreign exchange rate and yield on government securities. Past episodes of rating changes have no or weak correlation with macroeconomic indicators.*

*India's fiscal policy, therefore, must not remain beholden to a noisy/biased measure of India's fundamentals and should instead reflect Gurudev Rabindranath Thakur's sentiment of a mind without fear. Despite ratings not reflecting fundamentals, noisy, opaque and biased credit ratings damage FPI flows. It is therefore imperative that countries engage with CRAs to make the case that their methodology must be corrected to reflect economies' ability and willingness to pay their external obligations. Moreover, the pro-cyclical nature of credit ratings and its potential adverse impact on economies, especially low-rated developing economies must be expeditiously addressed. India has already raised the issue of pro-cyclicality of credit ratings in G20. In response, the Financial Stability Board (FSB) is now focusing on assessing the pro-cyclicality of credit rating downgrades.*

## THE BIAS AGAINST EMERGING GIANTS IN SOVEREIGN CREDIT RATINGS

3.1. Never in history has the fifth largest economy in the world been rated a BBB-! Since 1994, the only times that the sovereign credit ratings of the fifth largest economy in current US$ terms has precipitously declined, has been when emerging giants China and India have come to occupy the position. Figure 1 shows that the sovereign credit rating of the fifth largest economy (current US$) by two credit ratings agencies (CRAs) declined steeply in 2005 following China's entry into the top five economies. Similarly, the sovereign credit rating of the fifth largest economy (current US$) by two CRAs declined steeply in 2019 following India's entry into the top five economies.

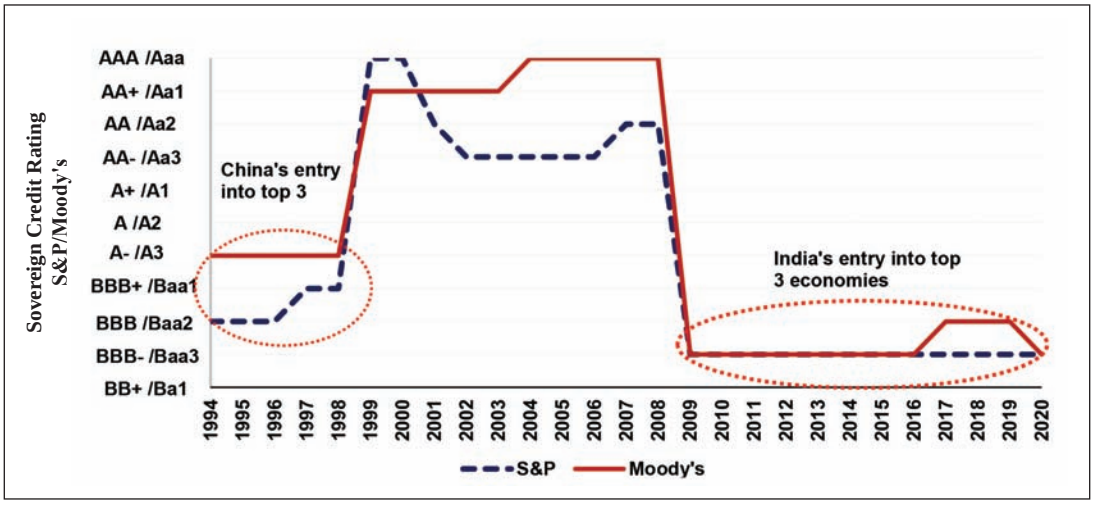
**Figure 1: Sovereign Credit Rating of Fifth Largest Economy (Current US $)**




Source: Bloomberg and World Bank

3.2. A similar trend is seen in PPP current international $ terms. Since 1994, the only times that the sovereign credit ratings of the third largest economy in PPP terms has steeply declined, has been when emerging giants China and India have become the third largest economy. Figure 2 shows that the sovereign credit rating of the third largest economy (PPP) declined sharply in 1994 by two CRAs, following China's entry into the top three economies. Similarly, the sovereign credit rating of the third largest economy (PPP) declined sharply in 2009 by two CRAs, following India's entry into the top three economies.

**Figure 2: Sovereign Credit Rating of Third Largest Economy (PPP Current International $)**




Source: Bloomberg and World Bank

## INDIA'S SOVEREIGN CREDIT RATINGS

3.3 This anomaly in sovereign credit ratings has continued for India. Currently, India is rated investment grade by three major CRAs – S&P, Moody's and Fitch. India's sovereign credit ratings during 1998-2020 are presented in Table 1. Rationale given for the same by these CRAs is depicted in Figure 3. India's sovereign credit rating downgrades during 1998-2018 are mainly confined to the 1990s on account of the post-Pokhran sanctions in 1998. India's sovereign credit ratings upgrades have mainly been witnessed in the second half of 2000s, in recognition of higher economic growth prospects and strengthened fundamentals of the Indian economy.

3.4 Further, during most of the 1990s and mid 2000s, India's sovereign credit rating was speculative grade. India's credit rating was upgraded to investment grade by Moody's in 2004, Fitch in 2006 and S&P in 2007 (Table 1). Notably, Indian economy grew at an average rate of over six per cent (Figure 4), and at approximately eight per cent in several years during this period. Hence, during most of the decade of 1990 and early 2000's, India's high rate of economic growth co-existed with a sovereign credit rating of "speculative grade".

**Table 1: India's Sovereign Credit Rating (1998-2020)**

| Date | S&P | Moody's | Fitch |
|---|---|---|---|
| June 1998 | | Ba2* | |
| October 1998 | BB* | | |
| March 2000 | | | BB+* |
| November 2001 | | | BB* |
| February 2003 | | Ba1* | |
| January 2004 | | | BB+* |
| January 2004 | | Baa3 | |
| February 2005 | BB+* | | |
| August 2006 | | | BBB- |
| January 2007 | BBB- | | |
| November 2017 | | Baa2 | |
| June 2020 | | Baa3 | |

*Speculative Grade; Green highlights ratings upgrade; Red highlights ratings downgrade, Black indicates first rating
Source: Compiled from S&P Global, Fitch and Moody's

## Box 1: What are Sovereign Credit Ratings?

Sovereign credit ratings seek to quantify issuers' ability to meet debt obligations. When favourable, these can facilitate countries access to global capital markets and foreign investment. Table below presents what three key CRAs – S&P, Moody's and Fitch, seek to measure.

**What Credit Ratings Measure**

| | |
|---|---|
| Fitch | "Credit ratings express risk in relative rank order, which is to say they are ordinal measures of credit risk and are not predictive of a specific frequency of default or loss. Fitch Ratings' credit ratings do not directly address any risk other than credit risk, ratings do not deal with the risk of a market value loss on a rated security due to changes in interest rates, liquidity and other market considerations." |
| Moody's | "There is an expectation that rating will, on average, relate to subsequent default frequency, although they typically are not defined as precise default rate estimates. Moody's ratings are therefore intended to convey opinions of the relative creditworthiness of issues and obligations...Moody's rating process also involves forming views about the likelihood of plausible scenarios, or outcomes—not forecasting them, but instead placing some weight on their likely occurrence and on the potential credit consequences. Normal fluctuations in economic activity are generally included in these scenarios, and by incorporating our views about the likehood of such scenarios, we give our ratings relative stability over economic cycles and a sense of horizon." |
| Standard & Poor's | "Standard & Poor's credit ratings are designed primarily to provide relative rankings among issues and obligations of overall creditworthiness; the ratings are not measures of absolute default probability. Creditworthiness encompasses likehood of default and also includes payment priority, recovery, and credit stability." |

Source: IMF (2010)

Sovereign credit ratings broadly rate countries as either investment grade or speculative grade, with the latter projected to have a higher likelihood of default on borrowings. The threshold of Investment grade is considered to be BBB- for S&P and Fitch and Baa3 for Moody's. Table below presents the rating scale comparison between S&P, Moody's and Fitch.

**Credit Rating Scale Comparison between some major CRAs**

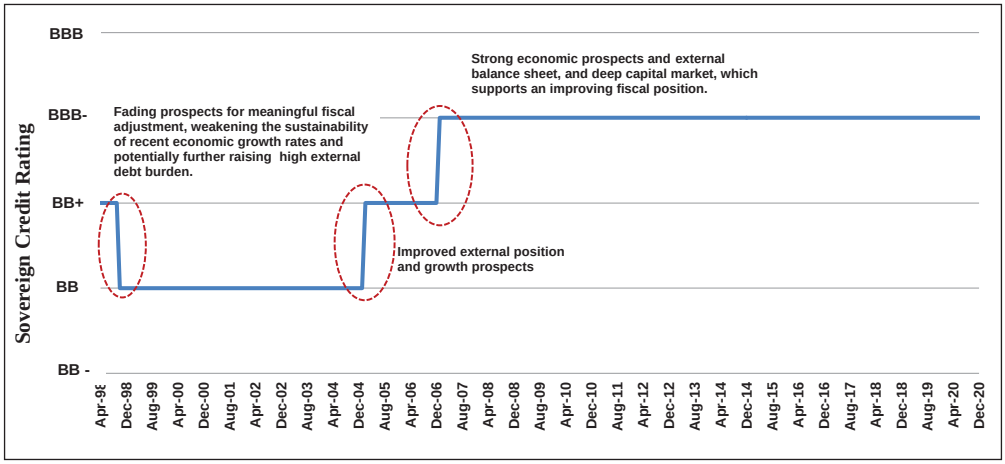
| Interpretation | Fitch and S&P | Moody's |
|---|---|---|
| Highest quality | AAA | Aaa |
| High quality | AA+ | Aa1 |
| | AA | Aa2 |
| | AA– | Aa3 |
| Strong payment capacity | A+ | A1 |
| | A | A2 |
| | A– | A3 |
| Adequate payment capacity | BBB+ | Baa1 |
| | BBB | Baa2 |
| | BBB– | Baa3 |
| Likely to fulfill obligations, on going uncertainty | BB+ | Ba1 |
| | BB | Ba2 |
| | BB– | Ba3 |
| High-risk obligations | B+ | B1 |
| | B | B2 |
| | B– | B3 |
| Vulnerable to default | CCC+ | Caa1 |
| | CCC | Caa2 |
| | CCC– | Caa3 |
| Near or in bankruptcy or default | CC | Ca |
| | C | C |
| | D | D |

Source: IMF (2010)

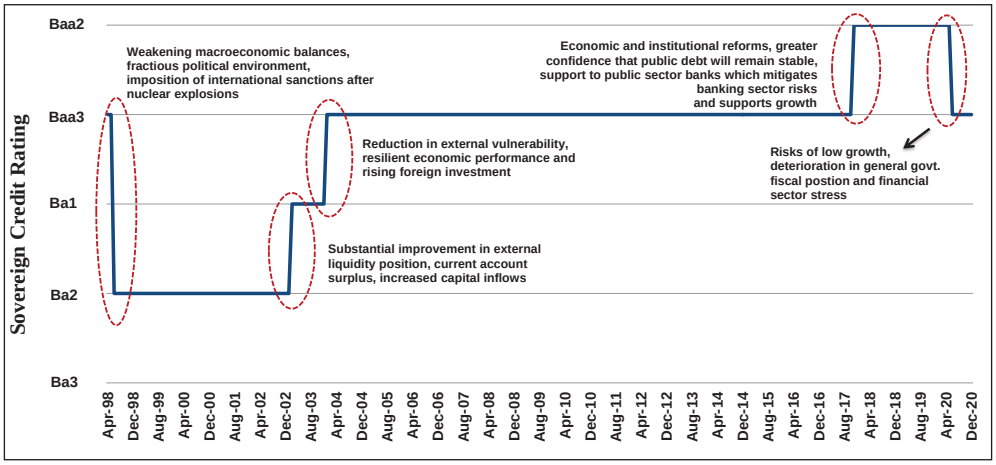
Examples of credit ratings methodologies employed by some CRAs may be seen in the Appendix, which presents the credit ratings methodology of Moodys' and Fitch.

**Figure 3: India's Sovereign Credit Rating by CRAs (1998-2020) and Rationale**

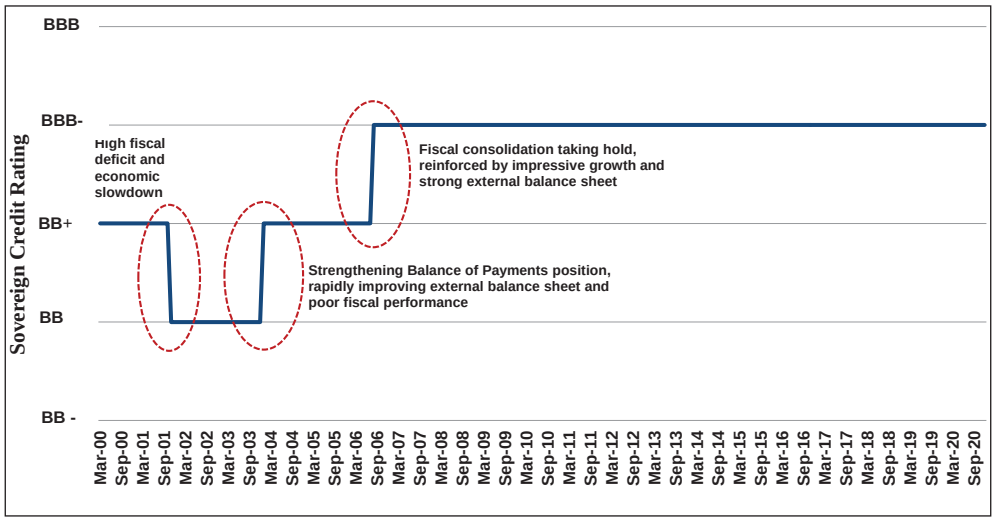
**(A) S&P**




**(B) Moody's**

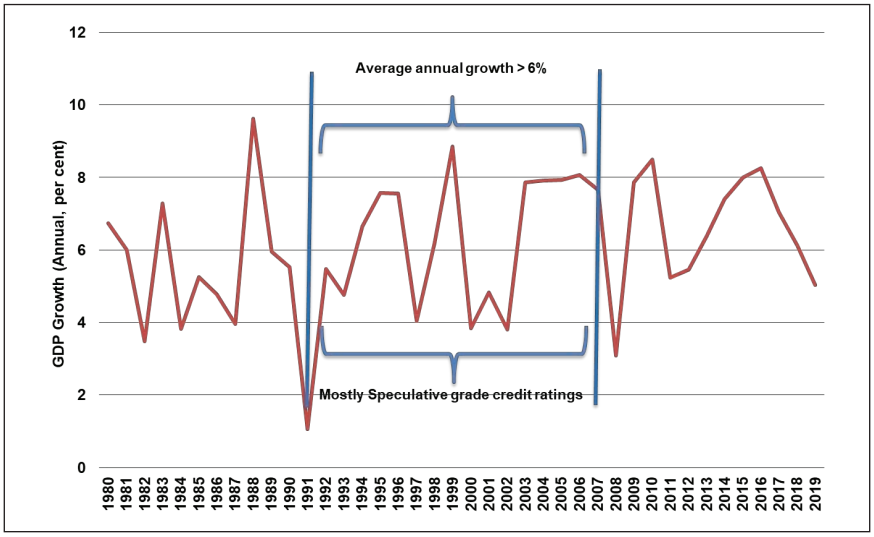



**(C) Fitch**




Source: S&P Global, Moody's and Fitch

**Figure 4: India's GDP Growth Annual (Per cent) (1990-2020)**




Source: MoSPI and RBI

## DOES INDIA'S SOVEREIGN CREDIT RATING REFLECT ITS FUNDAMENTALS? NO!

3.5 There is a large academic literature that highlights bias and subjectivity in sovereign credit ratings, especially against countries with lower ratings (see Box 2 for a select literature review). Do the fundamentals that supposedly drive sovereign credit ratings rationalise this historical anomaly of India's low ratings? In this chapter, the Survey asks this important question and answers a resounding No!

### Box 2: Select Literature on Bias and Subjectivity in Sovereign Credit Ratings

Ferri, Liu, and Stiglitz (1999) suggested that CRAs aggravated the East Asian crisis by first failing to predict its emergence and thereafter becoming excessively conservative. CRAs downgraded East Asian crisis countries more than what would have been justified by these countries' worsening economic fundamentals. This adversely affected the supply of international capital to these countries. Ferri, Liu, and Stiglitz (1999) also proposed an endogenous rationale for CRAs becoming excessively conservative after making errors in predicting the crisis – that of recovering from the damage caused by these errors and rebuilding their own reputation.

Reinhart (2002) found evidence of procyclicality in ratings through her study of 62 economies over the period 1979-1999. She observed that sovereign credit ratings tend to be reactive, especially for emerging market economies, with significantly higher probability of downgrade as well as higher size of downgrade as compared to developed economies.

Kaminsky and Schmukler (2002) also found evidence of procyclicality of credit ratings and that rating agencies may be contributing to financial market instability in emerging economies. They observed that rating upgrades take place after market rallies while downgrades take place after downturns. Further, they suggested that even "*if rating agencies do not behave procyclically, their announcements may still trigger market jitters because many institutional investors can hold only investment-grade instruments. Downgrading (or upgrading) sovereign debt below (or above) investment grade may thus*

*have a drastic impact on prices because these rating changes can affect the pool of investors. These effects are not confined to the pool of investors acquiring sovereign debt. When a credit rating agency downgrades a country's sovereign debt, all debt instruments in that country may have to be downgraded accordingly because of the sovereign ceiling doctrine. Commercial banks downgraded to subinvestment grade will find it costly to issue internationally recognized letters of credit for domestic exporters and importers, isolating the country from international capital markets. Downgrading corporate debt to subinvestment grade means that firms will face difficulties issuing debt on international capital markets*".

Gültekin-Karakaş, Hisarciklilar and Öztürk (2010) studied the sovereign credit ratings of 93 countries from 1999-2010 and found evidence that CRAs give higher ratings to developed countries regardless of their macroeconomic fundamentals. They suggested that macroeconomic fundamentals should be of core importance in assigning sovereign credit ratings since they indicate the ability and willingness to pay of countries.

Vernazza and Nielsen (2015) decomposed the sovereign credit ratings assigned by CRAs into objective and subjective components. They found that the objective component has explanatory power to predict defaults in the short and long run. However, they found that the "damaging bias" of sovereign credit ratings lies in its 'subjective' component, which biases default predictions in the wrong direction, with potentially dramatic consequences. Vernazza and Nielsen (2015) suggested that the "*biggest casualty of this was the Eurozone periphery, which was downgraded far too heavily during the 2009–2011 sovereign debt crisis as the rating committees repeatedly overruled the signal coming from fundamentals. In light of our findings, we suggest that credit rating agencies should be stripped of their regulatory powers and these transferred to an international body. Failing that, the ratings agencies should be forced to substantially increase transparency, including publishing a separate breakdown of the 'objective' and 'subjective' components of ratings, the minutes of the rating committees, and the voting records*".

De Moor, Luitel, Sercu and Vanpée (2018) found that the subjective component of S&P, Moody's and Fitch ratings tends to be large, especially for low-rated countries. Through their study of 23 developed and 80 emerging economies during 1995-2014, they observed that for the lowest-rated countries, the subjective component of sovereign credit ratings led to a downward adjustment of the objective rating by up to five notches while for the highest-rated countries, it led to an upward adjustment by one to four notches. They also found that this subjective component was uniform across credit rating agencies and varied mildly over time without following clear trends.

Tennant and Tracey (2016) observed scope for bias in sovereign credit ratings regarding choice of determinants and weights assigned to them, which is further enhanced given their opacity and subjectivity. Their study of 132 countries during 1997-2011 highlighted distinctions between ratings actions taken for high income and lower-middle and low income countries, as well as between regional grouping of poor countries. Their results provided clear empirical indications of bias – "*S&P, Moody's and Fitch all find it more difficult to upgrade poor countries relative to rich countries, for any given improvement in ability and willingness to repay debts. S&P and Fitch are further shown to find it more difficult to upgrade African countries relative to other developing countries, for any given improvement in ability and willingness to repay debts. These results are taken as a strong indication of bias, as they are highly significant even though we controlled for the key observed economic and*

*institutional determinants of sovereign debt ratings, unobserved country-specific fixed effects and the CRA's desire for rating stability*".

Fuchs and Gehring (2017) examined the evidence of "home bias" in sovereign credit ratings by CRAs based on data of 143 sovereigns from nine agencies based in six countries. Their findings suggested that respective home country, countries with linguistic and cultural similarity, and countries with higher home-bank exposures received higher ratings than justified by their political and economic fundamentals.

Hadzi-Vaskov and Ricci (2019), in their study of 106 countries during 1998-2014, found further evidence of bias and subjectivity in sovereign credit ratings. They observed a non-linear negative relation between public debt and sovereign credit ratings, which further depends on the rating grade. This non-linear effect is strongest in the low investment grades, smallest in the non-investment grades, and intermediate for high investment grades. For instance, through an ordered probit and logit model, they found that a debt increase by ten per cent of GDP was associated with a five per cent higher probability of being downgraded within a window of five adjacent grades for countries rated in the low investment grades while it was almost zero for countries with the lowest ratings in the non-investment grade, and three percent for best rated countries in the higher investment grade. They found that this non-linear relationship between public debt and sovereign credit ratings of advanced and emerging market economies explained the varied effect of debt on sovereign credit ratings between these countries, even when controlling for income and other macroeconomic parameters.

Tennant, Tracey and King (2020), through a heterogeneous middle-inflated ordered model, found a statistical bias in sovereign credit ratings against poor countries whenever their fundamentals change, highlighting a cause of concern since such biases can have self-fulfilling consequences as suggested by second-generation crisis models.

3.6 Figure 1 and 2 suggest evidence of bias in sovereign credit ratings (see Box 2) against emerging giants. It may be seen that sovereign credit ratings of the fifth largest economy in current US$ terms and that of the third largest economy in PPP $, dip sharply with the entry of China and India in this category.

## Box 3: Cohort for Examining whether Sovereign Credit Ratings reflects India's Fundamentals

A cohort of 33 countries (including India) is used for examining whether sovereign credit ratings reflect India's fundamentals across different dimensions. This cohort has sovereign credit ratings between A+/A1 to BBB-/Baa3 for S&P/ Moody's.

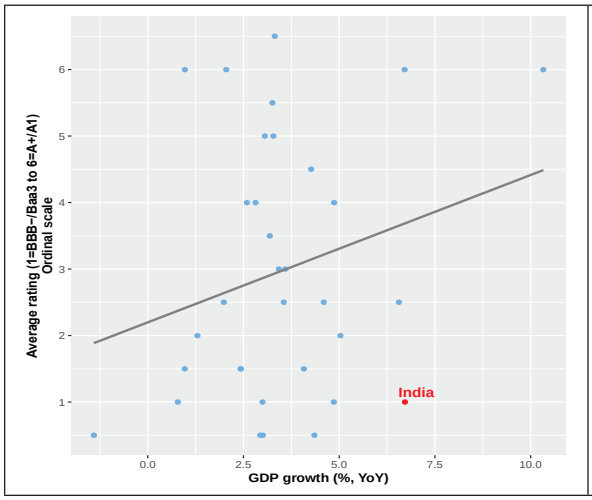
For purposes of graphical analysis, we use average sovereign credit rating across S&P and Moody's, where we set ratings below BBB-/Baa3 = 0, BBB-/Baa3 = 1, BBB/Baa2 = 2, BBB+/Baa1 = 3, A-/A3 = 4, A/A2 = 5, A+/A1 = 6 and ratings above A+/A1 = 7.

3.7 Figures 5-16 show correlations between sovereign credit ratings and different parameters for India's sovereign credit ratings cohort (see Box 3). Figure 5 shows a positive correlation between sovereign credit ratings and GDP growth rate across India's cohort. India is clearly a negative outlier i.e. it is currently rated much below expectation for its level of GDP growth.

3.8 A negative correlation is observed between sovereign credit ratings and Consumer Price

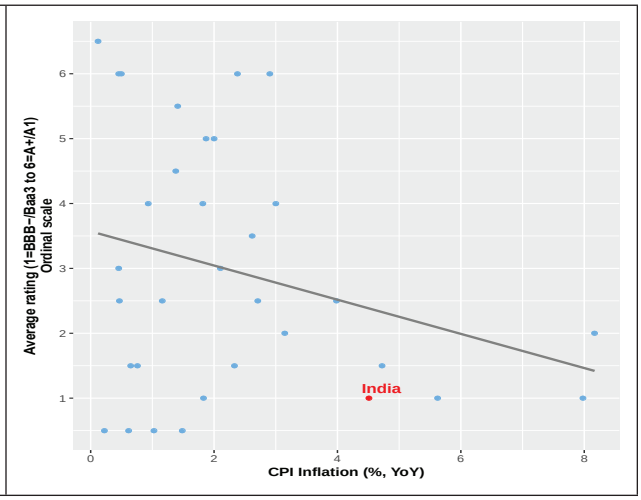
Index (CPI) inflation (Figure 6) across India's sovereign credit ratings cohort. It may be seen that India is a negative outlier, rated much below expectation for its level of CPI inflation.

**Figure 5: Sovereign Credit Ratings and GDP Growth Annual (Per cent)**




Source: Bloomberg and IMF

**Figure 6: Sovereign Credit Ratings and CPI Inflation (Per cent)**

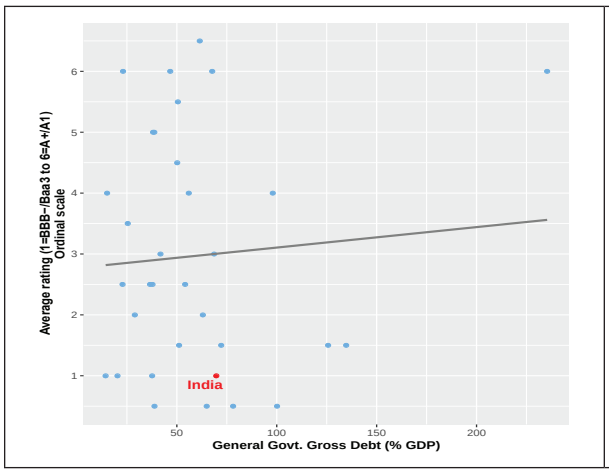



Source: Bloomberg and IMF

3.9 Figure 7 shows a negative correlation between sovereign credit ratings and general government gross debt (as per cent of GDP) across India's sovereign credit ratings cohort. India is a negative outlier and is currently rated much below expectation for its level of general government gross debt (as per cent of GDP).

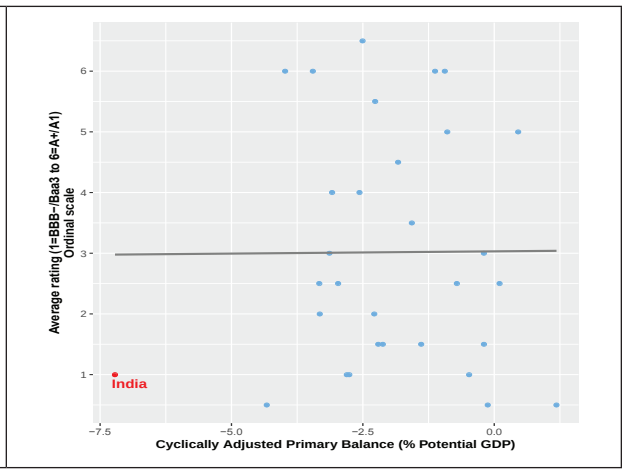
3.10 No clear correlation is observed between sovereign credit ratings and cyclically adjusted primary balance (per cent of potential GDP) across India's sovereign credit ratings cohort (Figure 8). India remains a negative outlier, currently rated much below expectation for its level of cyclically adjusted primary balance (per cent of potential GDP).

**Figure 7: Sovereign Credit Ratings and General Government Gross Debt (per cent of GDP)**




Source: Bloomberg and IMF

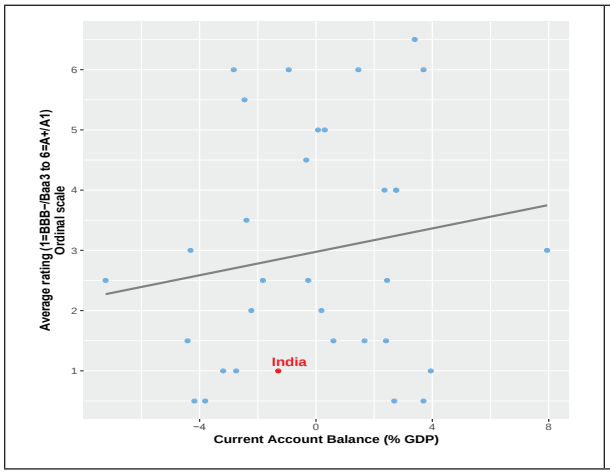
**Figure 8: Sovereign Credit Ratings and Cyclically Adjusted Primary Balance (per cent of Potential GDP)**




Source: Bloomberg and IMF

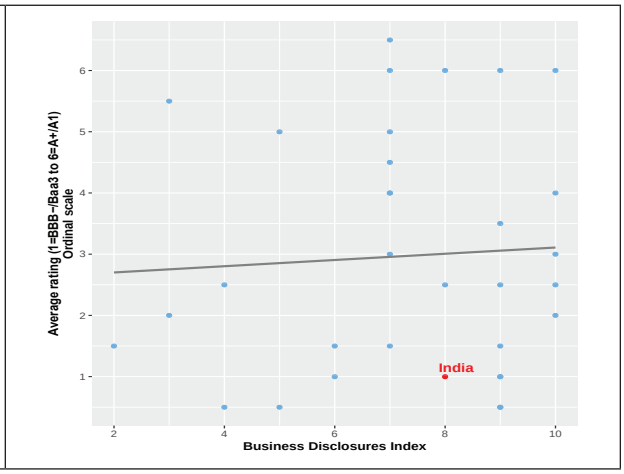
3.11 Figure 9 shows a positive correlation between sovereign credit ratings and current account balance (as per cent of GDP) across India's sovereign credit ratings cohort. However, India is a negative outlier, currently rated much below expectation for its level of current account balance (as per cent of GDP).

**Figure 9: Sovereign Credit Ratings and Current Account Balance (per cent of GDP)**




Source: Bloomberg and IMF

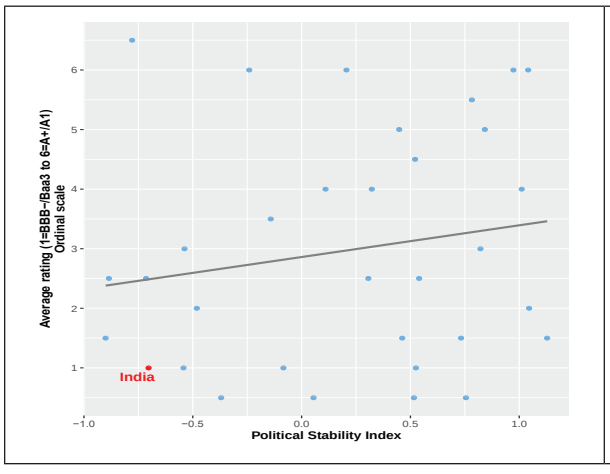
**Figure 10: Sovereign Credit Ratings and Investor Protection (Business Extent of Disclosure Index)**




Source: Bloomberg and World Bank

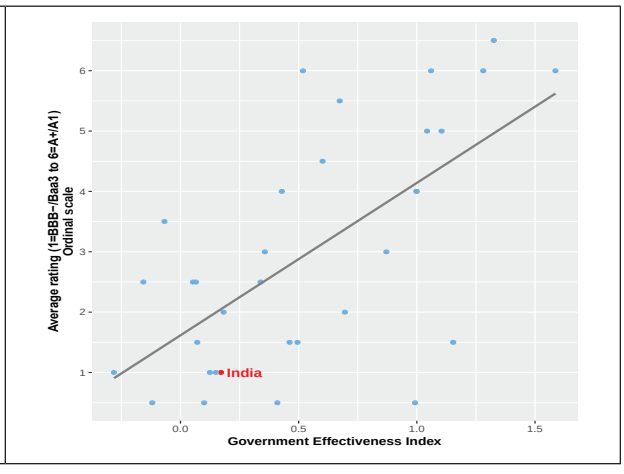
3.12 There is no clear pattern of correlation between sovereign credit ratings and investor protection, measured through the Business Extent of Disclosure Index, across India's sovereign credit ratings cohort (Figure 10). India remains a negative outlier, currently rated much below expectation for its level of investor protection.

**Figure 11: Sovereign Credit Ratings and Political Stability**




Source: Bloomberg and World Bank

**Figure 12: Sovereign Credit Ratings and Government Effectiveness**

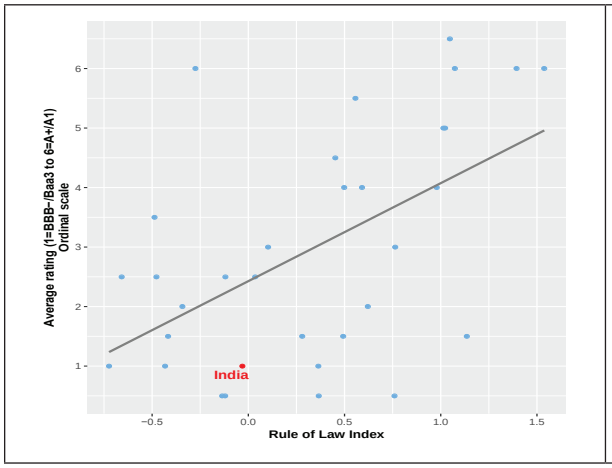



Source: Bloomberg and World Bank

3.13 Figure 11 shows a positive correlation between sovereign credit ratings and political stability across India's sovereign credit ratings cohort. It may be seen that India is a negative outlier and is currently rated much below expectation for its level of political stability.

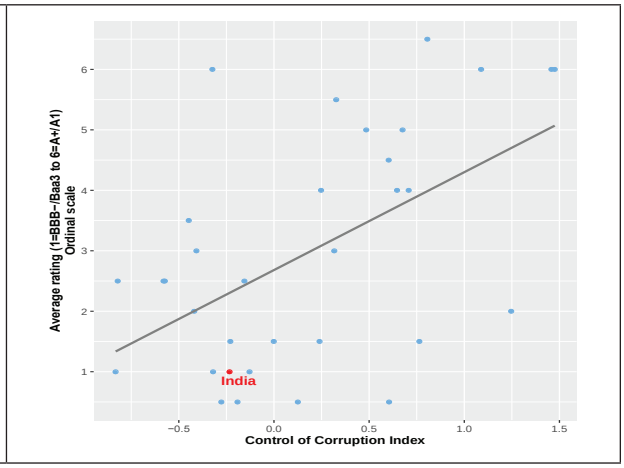
3.14 A positive correlation is observed between sovereign credit ratings and government effectiveness (Figure 12) across India's sovereign credit ratings cohort. India remains a negative outlier, rated much below expectation for its level of government effectiveness.

**Figure 13: Sovereign Credit Ratings and Rule of Law**




Source: Bloomberg and World Bank

**Figure 14: Sovereign Credit Ratings and Control of Corruption**

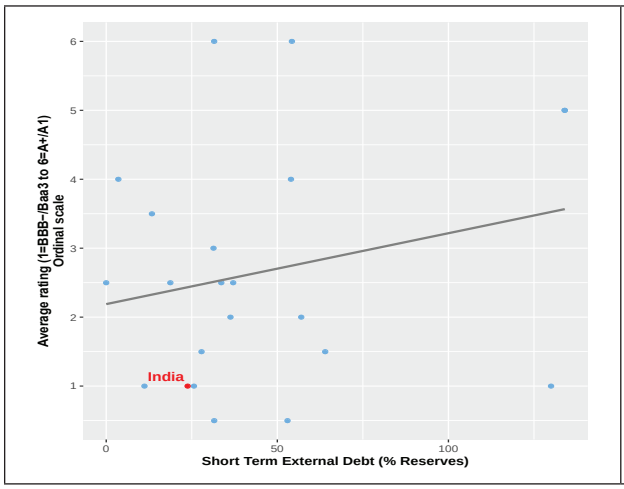



Source: Bloomberg and World Bank

3.15 Figure 13 shows a positive correlation between sovereign credit ratings and rule of law across India's sovereign credit ratings cohort. India is again a negative outlier, currently rated much below expectation for its level of rule of law.

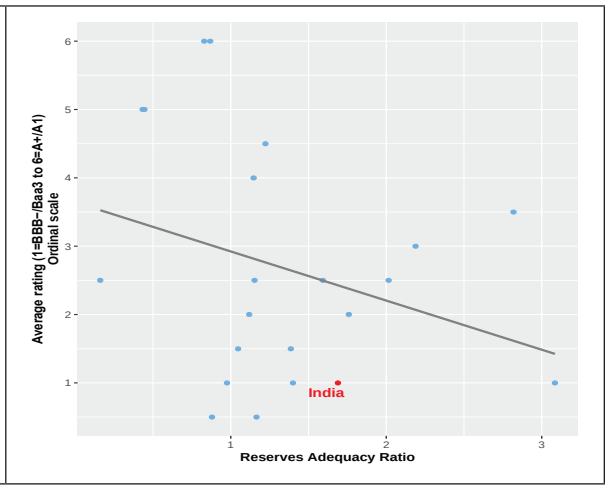
3.16 A positive correlation is observed between sovereign credit ratings and control of corruption (Figure 14) across India's sovereign credit ratings cohort. India is a negative outlier and is rated much below expectation for its level of control of corruption.

**Figure 15: Sovereign Credit Ratings and Short Term External Debt (as per cent of Reserves)**




Source: Bloomberg and World Bank

**Figure 16: Sovereign Credit Ratings and Reserves Adequacy Ratio**




Source: Source: Bloomberg and IMF

3.17 Sovereign credit ratings, as a reliable measure of economies' ability to pay, would be expected to be lower for countries with higher short-term debt as per cent of reserves. However, this is not the case for India's cohort! Figure 15 shows a positive correlation between sovereign

credit ratings and short-term external debt (as per cent of reserves) across countries with partial capital account convertibility in India's sovereign credit ratings cohort. India continues to be a negative outlier and is currently rated much below expectation for its level of short-term external debt (as per cent of reserves).

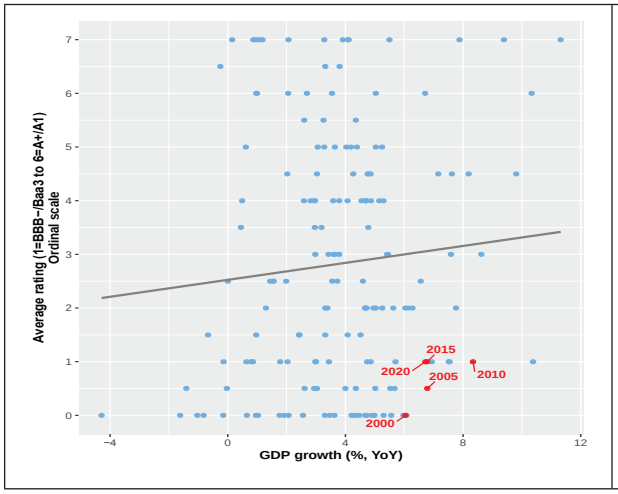
3.18 A negative correlation is observed between sovereign credit ratings and reserves adequacy ratio (Figure 16) across India's sovereign credit ratings cohort. India is a negative outlier and is rated much below expectation for its level of reserves adequacy ratio.

## HAVE INDIA'S SOVEREIGN CREDIT RATINGS REFLECTED ITS FUNDAMENTALS IN THE PAST? NO!

3.19 India's negative outlier status w.r.t. its sovereign credit ratings vis-à-vis performance on several parameters remains true not only now but also during the last two decades. India has consistently been rated below expectation as compared to its performance on various parameters during the period 2000-20. Figure 17 shows that within its sovereign credit ratings cohort, India has consistently been rated much below expectation for its level of GDP growth rate during the period 2000-20.

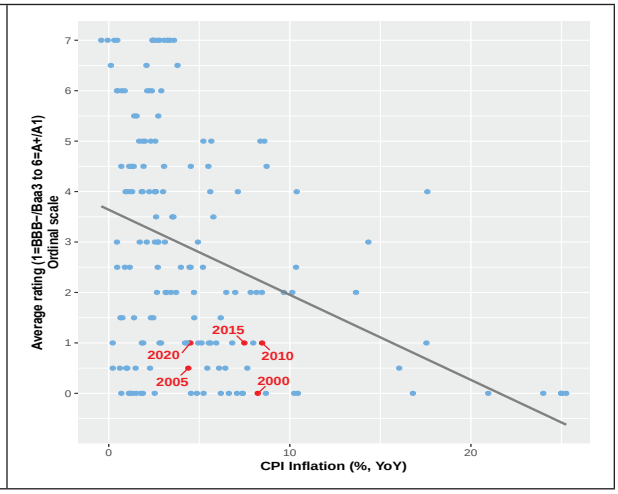
3.20 Figure 18 shows that during 2000-20, India has consistently been a negative outlier, rated much below expectation for its level of inflation within its sovereign credit ratings cohort.

**Figure 17: Sovereign Credit Ratings and GDP Growth Annual (Per cent)**




Source: Bloomberg, Datastream and IMF
Note: Red shows India's rating during 2000-20

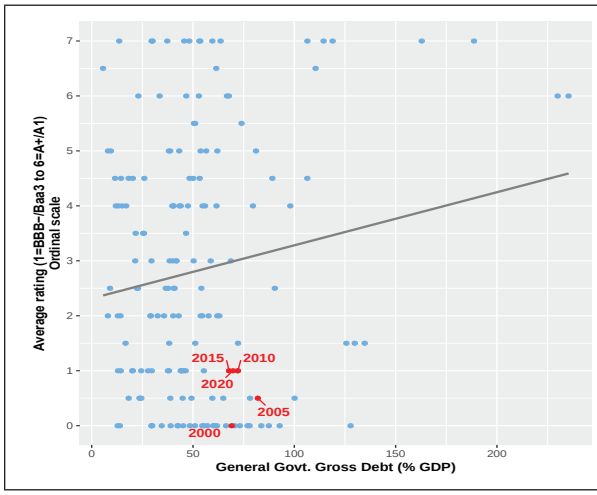
**Figure 18: Sovereign Credit Ratings and CPI Inflation**




Source: Bloomberg, Datastream and IMF
Note: Red shows India's rating during 2000-20

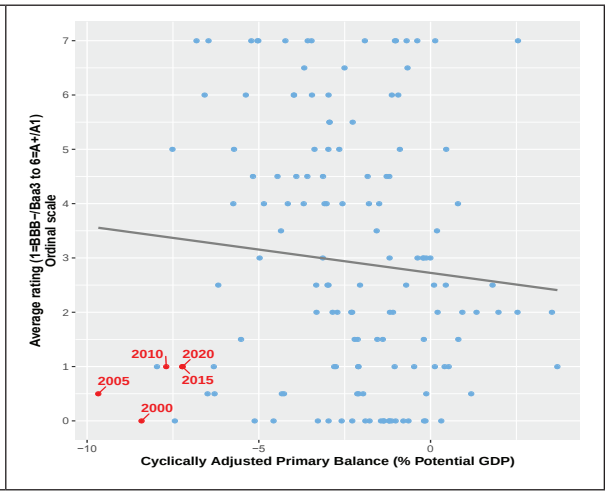
3.21 Figure 19 shows that within its sovereign credit ratings cohort, India has been a negative outlier and has consistently been rated much below expectation for its level of general government gross debt (per cent of GDP) during the period 2000-20.

**Figure 19: Sovereign Credit Ratings and General Government Gross Debt (per cent of GDP)**




Source: Bloomberg, Datastream and IMF
Note: Red shows India's rating during 2000-20

**Figure 20: Sovereign Credit Ratings and Cyclically Adjusted Primary Balance (per cent of Potential GDP)**

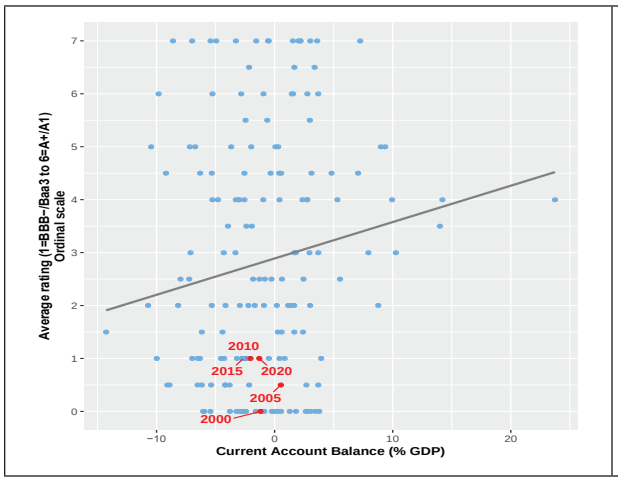



Source: Bloomberg, Datastream and IMF
Note: Red shows India's rating during 2000-20

3.22 Figure 20 shows that within its sovereign credit ratings cohort, India has consistently been rated much below expectation for its level of cyclically adjusted primary balance (per cent of potential GDP) and has been a negative outlier throughout the period 2000-20.

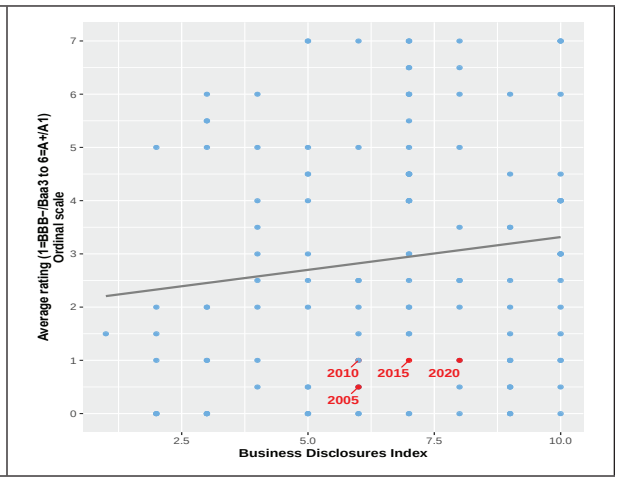
3.23 During 2000-20, India has consistently been a negative outlier, rated much below expectation for its level of current accent balance (per cent of GDP) within its sovereign credit ratings cohort (Figure 21).

**Figure 21: Sovereign Credit Ratings and Current Account Balance (per cent of GDP)**




Source: Bloomberg, Datastream and IMF
Note: Red shows India's rating during 2000-20

**Figure 22: Sovereign Credit Ratings and Investor Protection (Business Extent of Disclosure Index)**

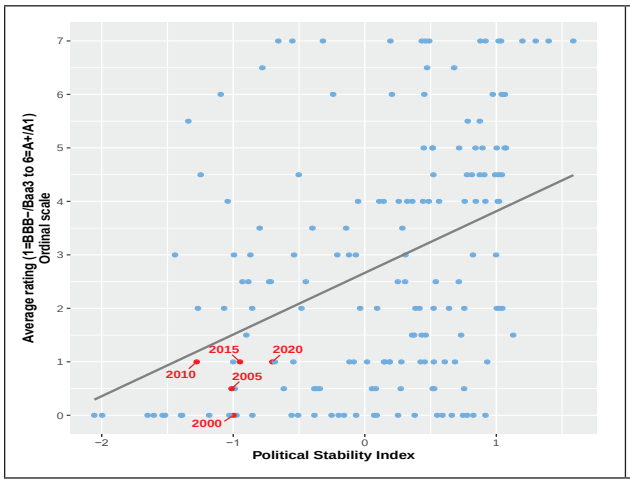



Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2005-20

3.24 Figure 22 shows that within its sovereign credit ratings cohort, India has consistently been rated much below expectation for its level of investor protection, as measured through

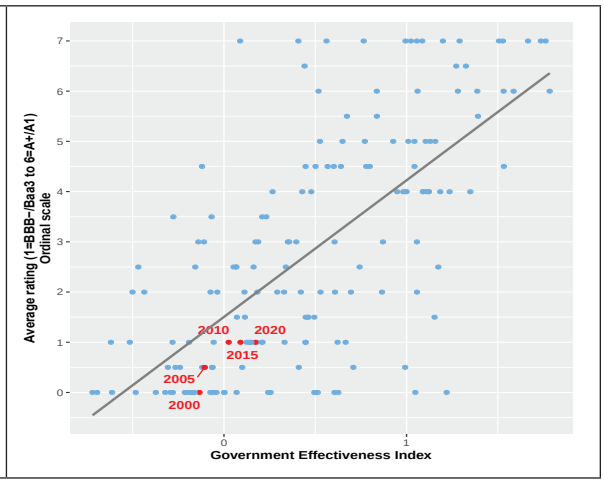
the Business Extent of Disclosure Index and has been a negative outlier throughout the period 2005-20.

**Figure 23: Sovereign Credit Ratings and Political Stability**




Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2000-20

**Figure 24: Sovereign Credit Ratings and Government Effectiveness**



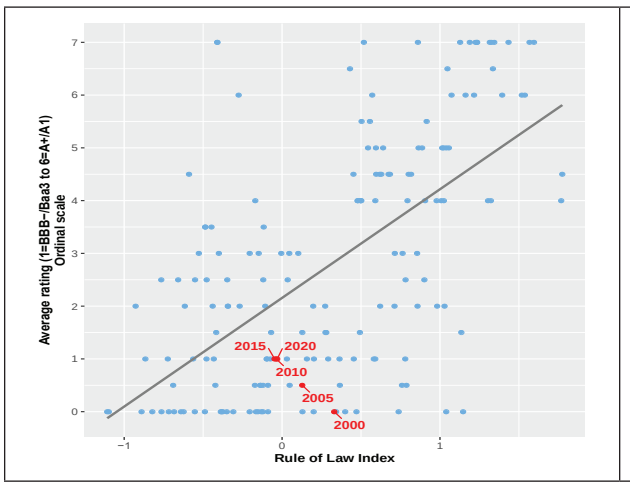

Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2000-20

3.25 Figure 23 shows that within its sovereign credit ratings cohort, India has consistently been a negative outlier, rated below expectation for its level of political stability during the period 2000-20.

3.26 During 2000-20, India has consistently been rated below expectation for its level of government effectiveness within its sovereign credit ratings cohort and has been a negative outlier (Figure 24).

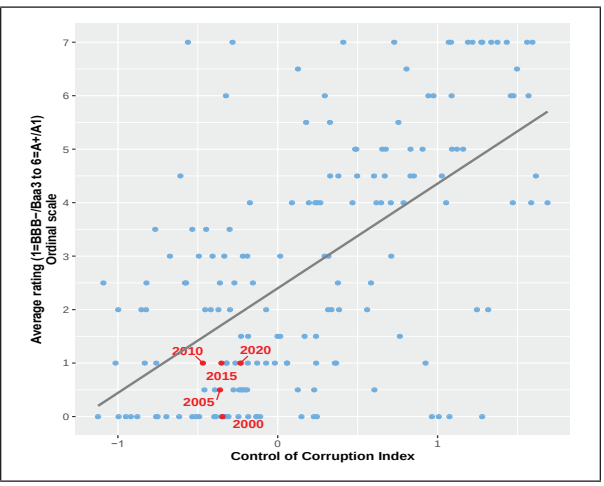
3.27 Figure 25 shows that within its sovereign credit ratings cohort, India has consistently been a negative outlier, rated much below expectation for its level of rule of law during the period 2000-20.

**Figure 25: Sovereign Credit Ratings and Rule of Law**




Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2000-20

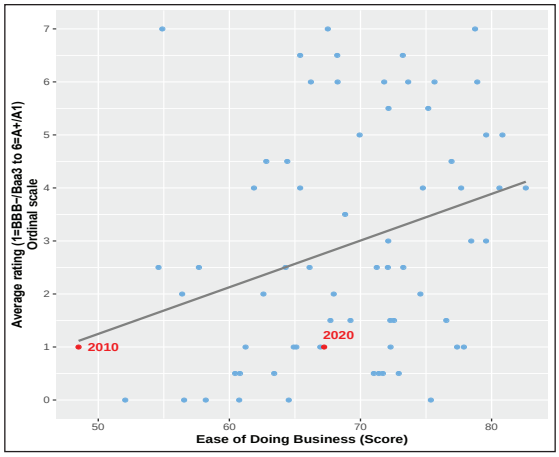
**Figure 26: Sovereign Credit Ratings and Control of Corruption**




Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2000-20

3.28 During 2000-20, India has consistently been rated below expectation for its level of control of corruption within its sovereign credit ratings cohort and been a negative outlier (Figure 26).

**Figure 27: Sovereign Credit Ratings and Ease of Doing Business**



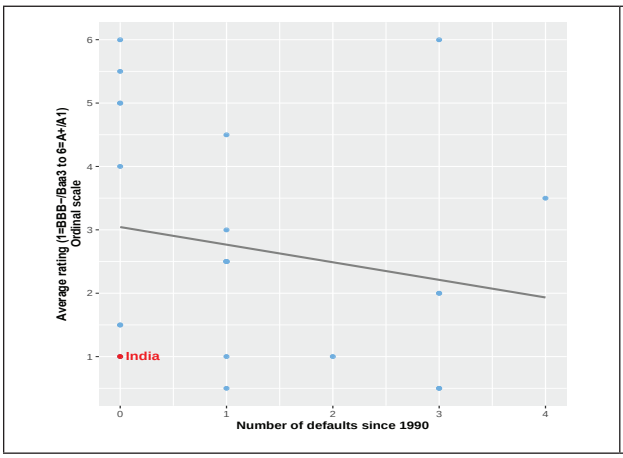

Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2010-20

3.29 Figure 27 shows that India has consistently been a negative outlier, rated below expectation for its level of ease of doing business within its sovereign credit ratings cohort during 2010-20.

## DOES INDIA'S SOVEREIGN CREDIT RATING REFLECT ITS WILLINGNESS AND ABILITY TO PAY? NO!

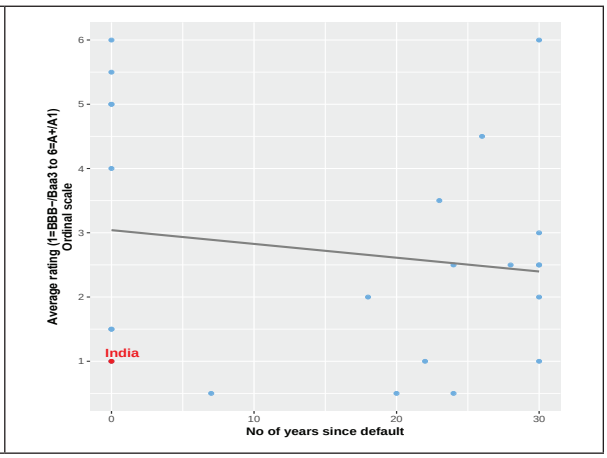
3.30 Credit ratings map the probability of default and therefore reflect the willingness and ability of borrower to meet its obligations. India's willingness to pay is unquestionably demonstrated through its zero sovereign default history. Yet as Figure 28 shows, within India's sovereign credit ratings cohort, India is rated much below expectation for its number of sovereign defaults since 1990 (which is zero for India), making it a negative outlier.

**Figure 28: Sovereign Credit Ratings and Number of Sovereign Defaults**




Source: Bloomberg; Datastream; S&P; Reinhart and Rogoff (2009)

**Figure 29: Sovereign Credit Ratings and Number of Years Since Last Sovereign Default**



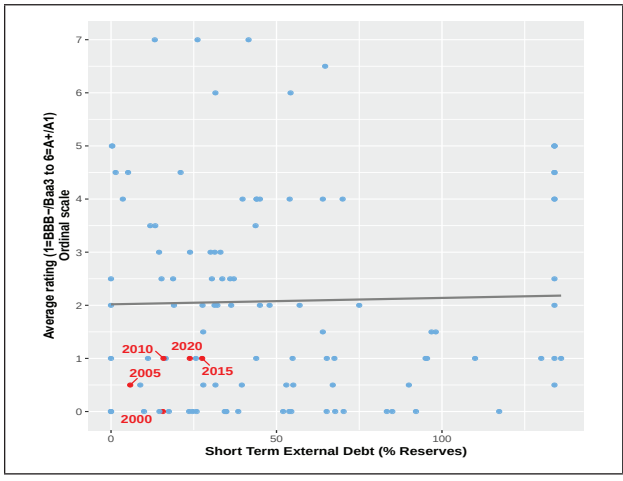

Source: Bloomberg; Datastream; S&P; Reinhart and Rogoff (2009)

3.31 India is again a negative outlier, rated below expectation for the numbers of years since last sovereign default (which is zero for India) within its sovereign credit ratings cohort (Figure 29). Unlike several of its cohort countries, India has never defaulted during the period.

3.32 India's ability to pay can be gauged not only by the extremely low foreign currency denominated debt of the sovereign but also by the comfortable size of its foreign exchange reserves that can pay for the short term debt of the private sector as well as the entire stock of India's sovereign and non-sovereign external debt. India's sovereign external debt as per cent of GDP stood at a mere four per cent as of September 2020 (DEA). Moreover, 54 per cent of India's sovereign external foreign currency denominated debt was owed to multilaterals and IMF as of end-March 2020 (DEA), which is not expected to impact credit rating assessments. Since India does not have full capital account convertibility, the private sector has to repay its foreign currency denominated debt by exchanging rupees through the forex reserves. India's non-government short term-debt as per cent of forex reserves stood at 19 per cent as of September 2020 (DEA). India's forex reserves stood at US$ 584.24 as of January 15, 2021 (RBI), greater than India's total external debt (sovereign and non-sovereign) of US$ 556.2 bn as of September 2020 (DEA). In corporate finance parlance, therefore, India resembles a firm that has negative debt, whose probability of default is zero by definition. Despite this compelling statistic, India is an inexplicable negative outlier in its ratings cohort. Figure 30 shows that within countries with partial capital account convertibility in India's sovereign credit ratings cohort, India has consistently been rated much below expectation for its level of short-term external debt (per cent of reserves) during the period 2000-20, emerging as a negative outlier.

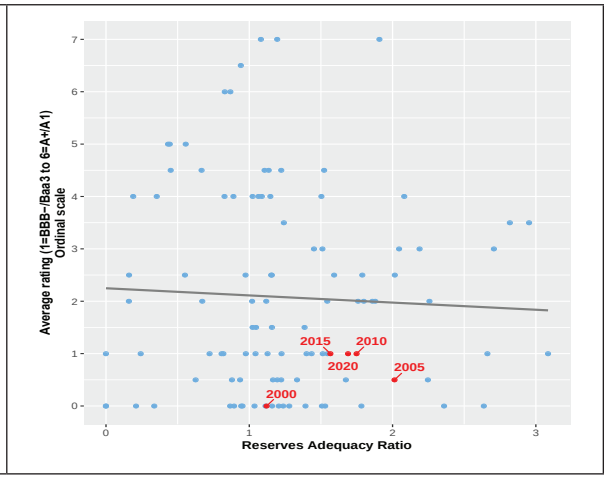
3.33 Similarly, India has consistently been a negative outlier, rated below expectation for its level of reserves adequacy ratio within its sovereign credit ratings cohort during 2000-20, (Figure 31).

**Figure 30: Sovereign Credit Ratings and Short Term External Debt (per cent of reserves)**




Source: Bloomberg, Datastream and World Bank
Note: Red shows India's rating during 2000-20

**Figure 31: Sovereign Credit Ratings and Reserves Adequacy Ratio**




Source: Bloomberg, Datastream and IMF
Note: Red shows India's rating during 2000-20

## Box 4: Methodology for Stress Test

We conducted a stress test on forex reserves amongst countries which have partial capital account convertibility and availability of data in India's sovereign credit ratings cohort.

Firstly, we calculated the country-wise coefficient of variation (CoV) of month-end forex reserves across the period February 2008 – November 2020. Secondly, we calculated the standard deviation (SD) of forex reserves for these countries by multiplying the CoV with current foreign exchange reserves (end-November 2020). Thirdly, we calculated forex reserves net of short term debt. Finally, we divided the forex reserves net of short term debt by SD to arrive at a stress test estimate.

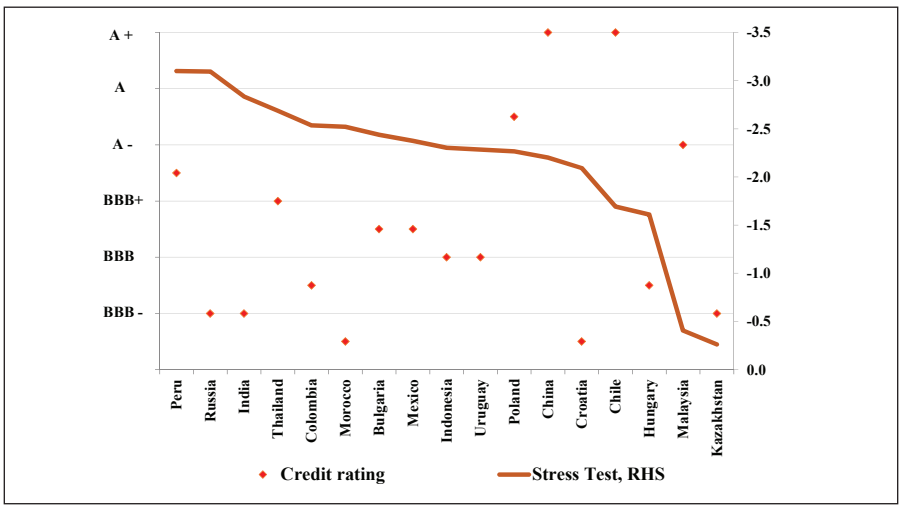
$$\text{Stress Test estimate} = (-)\frac{\text{Forex Reserves Net of Short Term Debt}}{\text{Standard Deviation of Forex Reserves}}$$

Countries with more comfortable forex reserves can withstand larger negative standard deviation shocks. Hence larger negative value of stress test estimate suggests better forex reserve position.

This stress test estimate is reported in Figure 32 for select countries in India's sovereign credit ratings cohort with partial capital account convertibility and where forex reserves net of short term debt is positive.

3.34 India's sovereign foreign denominated debt is met through India's forex reserves. Since India has partial capital account convertibility, this implies that private foreign denominated debt also needs to be met by either private export earnings or India's forex reserves. Figure 32 shows a negative correlation between sovereign credit rating and the stress test (see Box 4) amongst selected countries with partial capital account convertibility in India's sovereign credit ratings cohort. India is rated much lower as compared to its stress test estimate of -2.8, which is third highest in its cohort. This implies that India's forex reserves can withstand a negative 2.8 standard deviation shock even after meeting its short-term debt obligations, including those of the private sector, validating its ability to pay debt obligations. Given private export earnings, India's large forex reserves are in fact an underestimation of its ability to repay its short-term obligations. Yet India's sovereign credit rating is BBB-/Baa3, failing to capture this high ability to pay debt obligations!

**Figure 32: Sovereign Credit Ratings and Stress Test**




Source: Bloomberg, Datastream, World Bank and Survey Calculations

## EFFECT OF SOVEREIGN CREDIT RATING CHANGES ON SELECT INDICATORS

3.35 Changes in sovereign credit ratings can affect economies (see Box 5 for a select review of literature). From 1998 till date, India has witnessed four instances of a sovereign credit ratings downgrade and seven instances of a sovereign credit ratings upgrade. As ratings do not capture India's fundamentals, it comes as no surprise that past episodes of sovereign credit rating changes for India have not had major adverse impact on select indicators such as Sensex return, foreign exchange rate and yield on government securities.

### Box 5: Select Review of Literature on Effect of Sovereign Credit Ratings

Jaramillo and Tejada (2011) used a panel of 35 emerging market economies for the period 1997-2010 and observed that investment grade status reduced spreads by 36 per cent over and above that implied by macroeconomic fundamentals. They found that upgrades within the investment grade reduced spreads by five-ten per cent while there was no impact of changes within the speculative grade.

Kaminsky and Schmukler (2002), through their study of 16 emerging market economies during 1990-2000, found that changes in sovereign credit ratings significantly affect bond and stock markets, with average yield spreads increasing two percentage points and average stock returns decreasing one percentage point after downgrade. They observed that rating changes had stronger effects during crises in both domestic and foreign financial markets.

Afonso, Furceri and Gomes (2011) observed significant changes in government bond yields to changes in ratings and outlook, especially negative announcements. They found evidence of spill over of rating announcement from lower rated countries to higher rated countries.

Norden and Webber (2004) examined the response of stock markets to rating announcements made by credit agencies during 2000-02, and found that markets anticipate ratings downgrades and reviews for ratings downgrades. Li, Jeon, Cho and Chiang (2008) found sovereign rating changes to affect both, domestic as well as cross-country stock market returns, in five Asian countries during January 1990 to March 2003. Martell (2005) examined the effect of sovereign credit rating changes on emerging stock markets and found that local stock markets react to news of credit rating downgrades. They observed that in more developed emerging economies, firms experienced smaller stock price declines post a sovereign credit rating downgrade.

Cai, Gan and Kim (2018) examined foreign direct investment (FDI) from 31 OECD donors to 72 recipient economies during 1985-2012, and found that donors' as well as recipients' credit ratings impact FDI flows. They observed that countries in high rated regions receive more FDI and that lower rated non-OECD and higher rated OECD recipients received more FDI. De, Mohapatra and Ratha (2020) studied sovereign credit ratings and private capital flows to emerging market economies during 1998-2017, and found that post the 2008 global financial crisis, relative ratings affect portfolio flows.

Alsakka and ap Gwilym (2012) studied the impact of sovereign credit ratings on foreign exchange spot markets during 1994-2010 and found that ratings affect own-country exchange rates as well as have strong regional spill over effect on exchange rates.

**Box 6: Methodology for Examining Effect of Changes in India's Sovereign Credit Ratings on Select Indicators**

We examine the effect of changes in India's sovereign credit ratings during 1998-2018 on select indicators – stock market return, foreign exchange rate, yield on government securities and foreign portfolio investment flows.

We use Sensex return as change in stock market indicator; changes in INR/USD exchange rate as the foreign exchange rate indicator; 5 Year G-Sec yield, 10 Year G-Sec yield and Spread (RHS) as the government securities indicators; and FPI Equity and FPI Debt flows as FPI indicators. Sensex return and changes in exchange rate (INR/USD), G-Sec yields and spread (difference between 10 year and 5 year yield) and FPI (Equity and Debt) are defined as change over previous period.

The potential effects of credit ratings changes are examined over three time periods:

**(i) Short Term:** This analysis is based on the occurrence of a ratings change (downgrade/upgrade) on day "T=0", and examines the average change in select indicators during a period of ten working days preceding and succeeding the event. In other words, assuming that a credit ratings change takes place on day "T", we examine the average change in indicators during "T-10" and "T+10" days.

**(ii) Medium Term:** This analysis is based on the occurrence of a ratings change (downgrade/upgrade) in month "T=0", and examines the average change in select indicators during a period of six months preceding and succeeding the event. In other words, assuming that a credit ratings change takes place in month "T", this section examines the average change in indicators during "T-6" and "T+6" months.

**(iii) Long Term:** This analysis is based on the occurrence of a ratings change (downgrade/upgrade) in year "T=0", and examines the average change in select indicators during a period of one year preceding and succeeding the event. In other words, assuming that a credit ratings change takes place in year "T", this section examines the average change in indicators during "T-1" and "T+1" years.

We also examine the effect of India's threshold sovereign credit ratings changes on select indicators. **Threshold changes** are defined as sovereign rating changes from investment grade to speculative grade and vice versa.

Daily, monthly and annual data for Sensex return is available for the entire period of analysis (1998-2018). Daily exchange rate data is available from August 1998 onwards while monthly and annual exchange rate data is available for the entire period 1998-2018. Monthly data for G-Sec yields (5 year and 10 year) and annual data for FPI Equity and FPI Debt (₹ Crore) is available for the entire period of analysis (1998-2018).

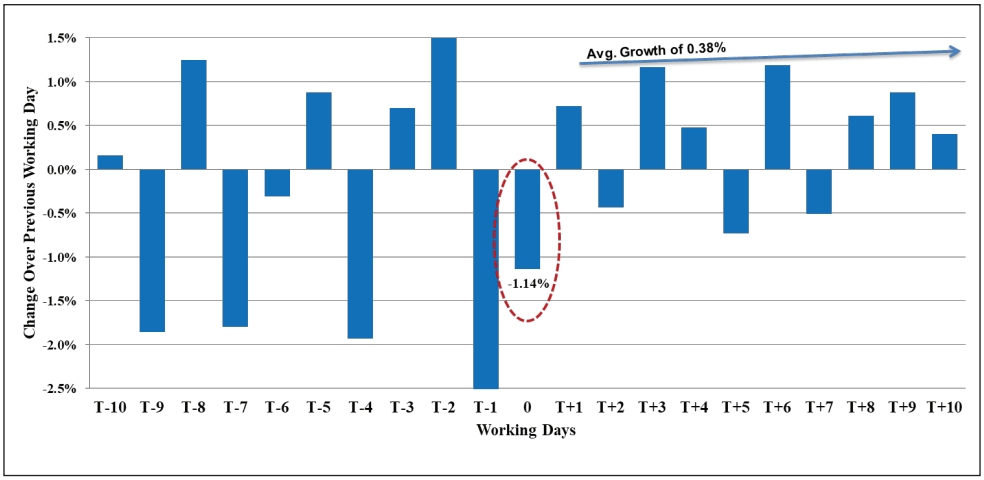
## Short-Term Effect of India's Sovereign Credit Rating Downgrades

3.36 Figure 33 shows the correlations between a credit ratings downgrade and Sensex return as well as exchange rate (INR/USD), averaged across downgrade episodes from 1998-2018. It may be seen in Figure 33 (i), that during the rating downgrade, Sensex return, on average, fell by

around one per cent over the previous day, and recovered to grow at 0.38 per cent over the next two weeks. Figure 33 (ii) shows that during the rating downgrade, exchange rate (INR/USD), on average, appreciated by around 0.01 per cent over the previous day, and appreciated by 0.01 per cent over the next two weeks.

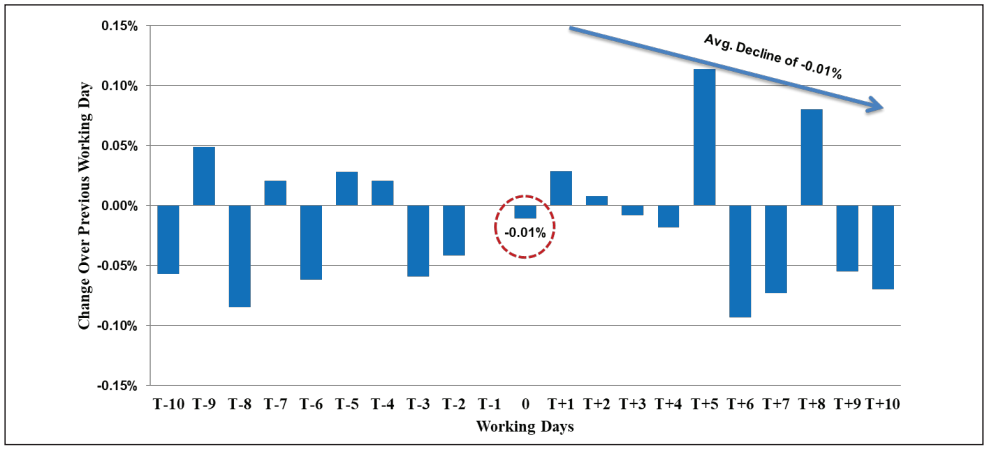
**Figure 33: Short-Term Average Change in Select Indicators during and after India's Sovereign Credit Ratings Downgrade (1998-2018)**

**(i) Sensex Return**




Note: 0 signifies day of change in credit ratings
Source: BSE and Survey calculations

**(ii) Exchange Rate (INR/USD)**




Note: 0 signifies day of change in credit ratings
Source: RBI and Survey calculations

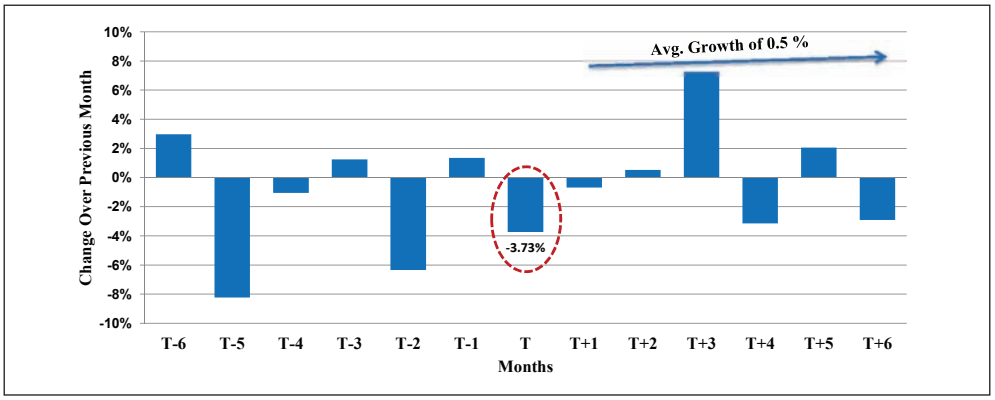
## Medium-Term Effect of India's Sovereign Credit Rating Downgrades

3.37 Figure 34 shows the correlations between a credit ratings downgrade and Sensex return, exchange rate (INR/USD) and G-Sec yields (5 year and 10 year) and spread in the medium term, averaged across downgrade episodes from 1998-2018. It may be seen in Figure 34 (i), that during ratings downgrade, Sensex return, on average, fell by around four per cent over

the previous month, and recovered to grow at 0.5 per cent over the next six months. Figure 34 (ii) shows that during ratings downgrade, exchange rate (INR/USD), on average, depreciated by around one per cent over the previous month and depreciated by 0.2 per cent over the next six months. Figure 34 (iii) shows that during ratings downgrade, yield on G-Sec (5 year), on average, fell by 1.4 per cent over the previous month, and grew at 0.1 per cent over the next six months. Yield on G-Sec (10 year), on average, fell by 3.3 per cent over the previous month, and declined by 0.29 per cent over the next six months. Spread (RHS), on average, fell by 22 per cent over the previous month, and grew at one per cent over the next six months.

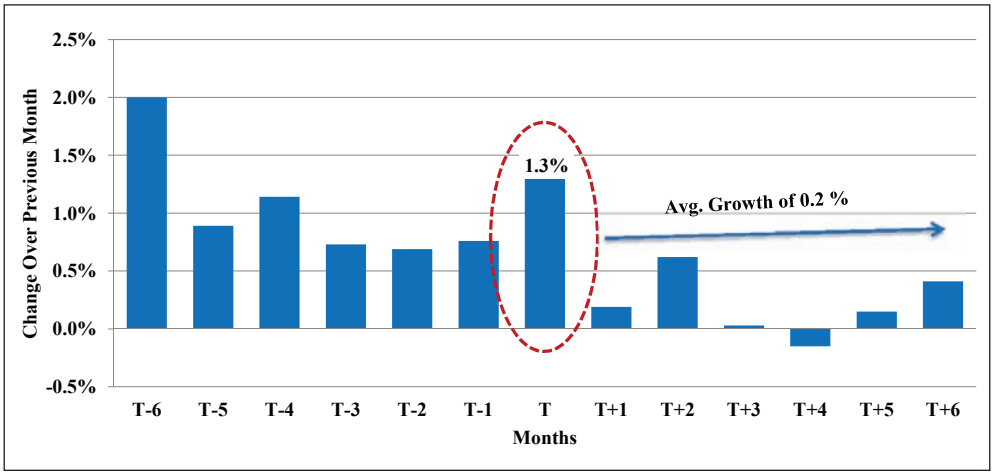
**Figure 34: Medium-Term Average Change in Select Indicators during and after India's Sovereign Credit Ratings Downgrade (1998-2018)**

**(i) Sensex Return**



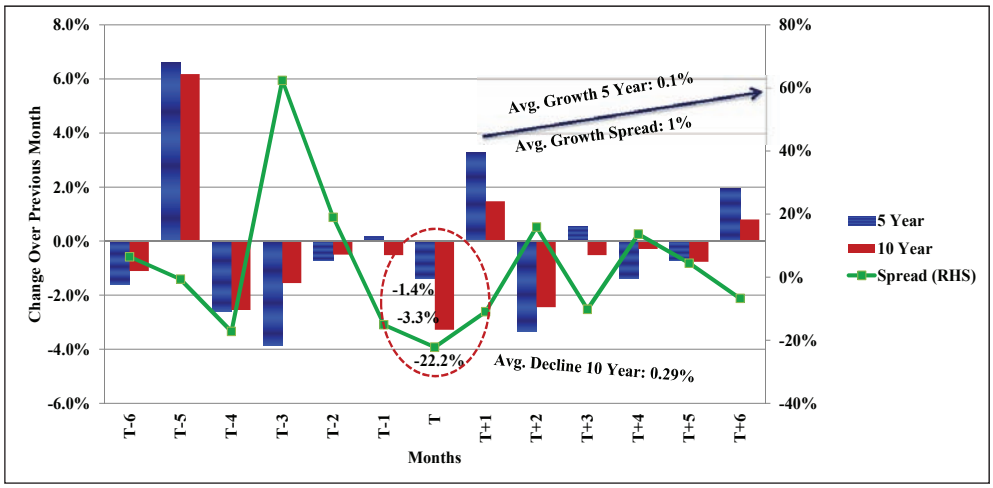

Note: 0 signifies month of change in credit ratings
Source: BSE and Survey calculations

**(ii) Exchange Rate (INR/USD)**




Note: 0 signifies month of change in credit ratings
Source: RBI and Survey calculations

**(iii) G-Sec Yield and Spread**



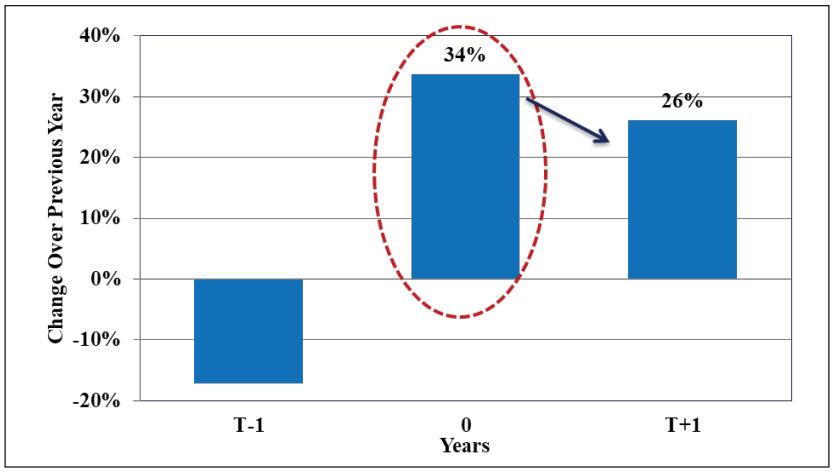

Note: 0 signifies month of change in credit ratings
Source: RBI and Survey calculations

## Long-Term Effect of India's Sovereign Credit Rating Downgrades

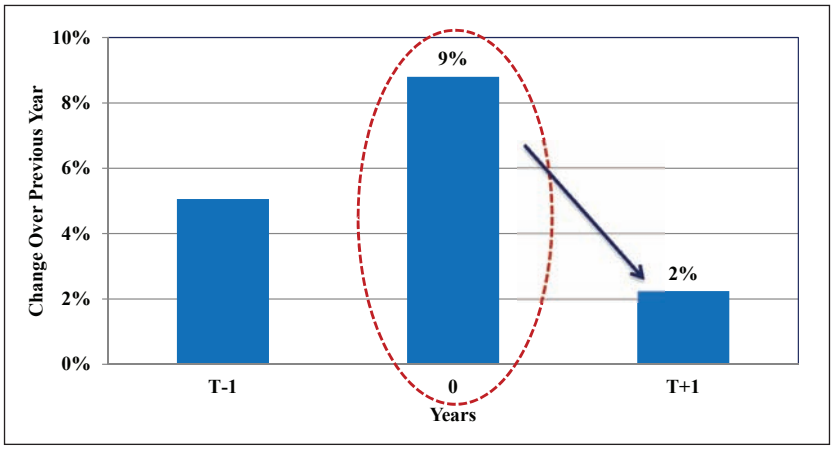
3.38 Figure 35 shows the correlations between a credit ratings downgrade and Sensex return, exchange rate (INR/USD) and FPI (Equity and Debt) in the long term, averaged across downgrade episodes from 1998-2018. It may be seen in Figure 35 (i) that during the year of ratings downgrade, on average, Sensex return rose by around 34 per cent over the previous year, and grew at 26 per cent the next year. Figure 35 (ii) shows that during the year of ratings downgrade, on average, exchange rate (INR/USD) depreciated by around nine per cent over the previous year, and depreciated by two per cent the next year. Figure 35 (iii) shows that during the year of the rating downgrade, on average, FPI Equity fell by 67 per cent over the previous year, and fell by 759 per cent in the next year. Average FPI Debt too followed a similar pattern, declining by 289 per cent, on average, during the year of rating downgrades, and declining by 114 per cent in the next year.

**Figure 35: Long-Term Average Change in Select Indicators during and after India's Sovereign Credit Ratings Downgrade (1998-2018)**

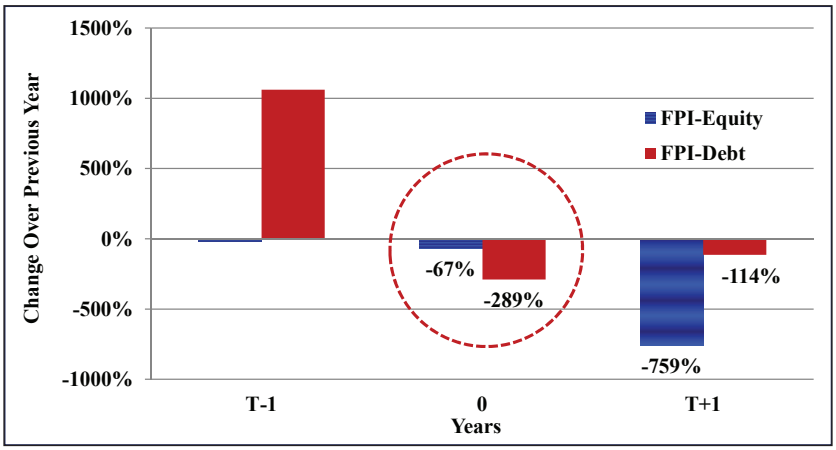
**(i) Sensex Return**




**(ii) Exchange Rate (INR/USD)**




**(iii) FPI (Equity & Debt)**




Note: 0 signifies year of change in credit ratings
Source: BSE, RBI, NSDL and Survey calculations

## Summary of Average Changes in Select Indicators during Credit Ratings Downgrades

3.39 Table 2 summarises the average changes observed in selected indicators during and after episodes of sovereign ratings downgrades between 1998-2018. It may be seen that ratings downgrade, on average, do not appear to have strong negative correlation with Sensex return and exchange rate (INR/USD) in the short, medium and long term. G-Sec yields and spread, on average, do not appear to be negatively correlated with ratings downgrades in the medium term. Rating downgrades, on average, appear to have a negative correlation with FPI (Equity and Debt) in the long term.

**Table 2: Summary of Average Changes in Select Indicators during India's Sovereign Credit Rating Downgrades (1998-2018)**

| Indicator | During/Post event | Short Term | | | Medium Term | | | Long Term | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sensex return | During event | -1.14% | | | -3.73% | | | 34% | | |
| | Post event | 0.38% | | | 0.5% | | | 26% | | |
| Exchange Rate | During event | -0.01% | | | 1.3% | | | 9% | | |
| | Post event | -0.01% | | | 0.2% | | | 2% | | |
| G Sec Yield | | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread |
| | During event | - | - | - | -1.4% | -3.3% | -22% | - | - | - |
| | Post event | - | - | - | 0.1% | -0.3% | 1% | - | - | - |
| FPI Flows | | Equity | | Debt | Equity | Debt | Equity | | Debt | |
| | During event | - | | - | - | - | -67% | | -289% | |
| | Post event | - | | - | - | - | -759% | | -114% | |

Note: Green indicates positive economic outcome, Red indicates negative economic outcome

## Effect of India's Sovereign Credit Rating Upgrades

3.40 Table 3 summarises the average changes in select indicators during and after India's sovereign credit ratings upgrade between 1998-2018. In the short run, during India's sovereign credit rating upgrades, Sensex return on average fell by around 0.7 per cent over the previous day, and grew at 0.2 per cent over the next two weeks. Exchange rate (INR/USD), on average, appreciated by around 0.05 per cent over the previous day during the rating upgrade, and appreciated by 0.03 per cent over the next two weeks.

3.41 Over the medium term, during India's sovereign credit ratings upgrade, Sensex return on average rose by around two per cent over the previous month and grew at an average rate of 1.8 per cent over the next six months. Exchange rate (INR/USD), on average, appreciated by around 0.3 per cent over the previous month during the rating upgrade, and appreciated by 0.4 per cent over the next 6 months. During ratings upgrade, yield on G-Sec (5 year), on average, increased by 0.2 per cent over the previous month, and grew at 0.6 per cent over the next six months. Yield on G-Sec (10 year), on average, fell by 0.5 per cent over the previous month, and grew at an average rate of 0.7 per cent over the next six months. Spread (RHS), on average, declined by five per cent over the previous month, and grew at an average rate of five per cent over the next six months (Table 3).

**Table 3: Summary of Average Changes in Select Indicators during India's Sovereign Credit Rating Upgrades (1998-2018)**

| Indicator | During/Post event | Short Term | | | Medium Term | | | Long Term | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sensex return | During event | -0.7% | | | 2% | | | 36% | | |
| | Post event | 0.2% | | | 1.8% | | | 13% | | |
| Exchange Rate | During event | -0.05% | | | -0.29% | | | -1.5% | | |
| | Post event | -0.03% | | | -0.36% | | | -2.3% | | |
| G Sec Yield | | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread |
| | During event | - | - | - | 0.2% | -0.5% | -5% | - | - | - |
| | Post event | - | - | - | 0.6% | 0.7% | 5% | - | - | - |
| FPI Flows | | Equity | | Debt | Equity | | Debt | Equity | | Debt |
| | During event | - | | - | - | | - | 264% | | 286% |
| | Post event | - | | - | - | | - | 303% | | 578% |

Note: Green indicates positive economic outcome, Red indicates negative economic outcome

3.42 In the long term, during India's sovereign credit ratings upgrade, Sensex return on average rose by around 36 per cent over the previous year and grew at an average rate of 13 per cent in the next year. Exchange rate (INR/USD), on average, appreciated by around 1.5 per cent over the previous year during the rating upgrade, and appreciated by two per cent in the next year. FPI Equity, on average, increased by 264 per cent over the previous year during the rating upgrade, and grew by 303 per cent the next year. Average FPI Debt too followed a similar pattern, increasing by 286 per cent, on average, during the rating upgrades, and grew at an average rate of 578 per cent the next year (Table 3).

## Effect of India's Threshold Sovereign Credit Rating Changes

3.43 India witnessed one instance of credit rating downgrade from the investment grade to speculative grade during the period 1998-2018. This coincided with the period of international sanctions following the Pokhran nuclear tests in 1998. India witnessed three instances of credit ratings upgrade from the speculative grade to the investment grade. These were in mid 2000s, as testament to India's higher economic growth prospects and strong fundamentals.

3.44 Table 4 presents a summary of average change in indicators during India's threshold sovereign credit rating downgrade (investment grade to speculative grade) between 1998-2018. In the short term, this downgrade was negatively correlated with Sensex return, which declined by five per cent during the downgrade and declined by 0.2 per cent over the next two weeks. In the medium term, Sensex return declined by 12 per cent during the event and declined by 0.8 per cent over the next six months. Exchange rate depreciated by four per cent during the downgrade and depreciated by 0.1 per cent over the next six months. Yield on 5-year government securities increased by 0.7 per cent during the downgrade and 0.1 per cent over the next six months. Yield on 10-year government securities fell by 0.2 per cent during the downgrade and increased by 0.2 per cent over the next six months. Spread (RHS) fell by 21 per cent during the downgrade and increased by 2.5 per cent over the next six months. In the long term, exchange rate depreciated by 13 per cent during the downgrade and depreciated by three per cent next year. Sensex return

increased by 64 per cent during the downgrade and fell by 21 per cent next year. Equity and Debt FPI fell sharply during the downgrade and the next year.

**Table 4: Summary of Average Changes in Select Indicators during India's Threshold Sovereign Credit Rating Downgrades (Investment Grade to Speculative Grade) (1998-2018)**

| Indicator | During/Post event | Short Term | | | Medium Term | | | Long Term | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sensex return | During event | -4.53% | | | -12% | | | 64% | | |
| | Post event | -0.15% | | | -0.8% | | | -21% | | |
| Exchange Rate | During event | - | | | 4.4% | | | 13% | | |
| | Post event | - | | | 0.12% | | | 3% | | |
| G Sec Yield | | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread |
| | During event | - | - | - | 0.7% | -0.2% | -21% | - | - | - |
| | Post event | - | - | - | 0.1% | 0.2% | 2.5% | - | - | - |
| FPI Flows | | Equity | Debt | | Equity | Debt | | Equity | Debt | |
| | During event | - | - | | - | - | | -114% | -225% | |
| | Post event | - | - | | - | - | | -1449% | -152% | |

Note: Green indicates positive economic outcome, Red indicates negative economic outcome

3.45 Table 5 presents a summary of average changes in select indicators during India's threshold credit rating upgrades (speculative grade to investment grade) between 1998-2018. Threshold upgrades were correlated with increase in Sensex returns in the medium term and with FPI (Equity and Debt) in the long term.

**Table 5: Summary of Average Changes in Select Indicators during India's Threshold Credit Rating Upgrades (Speculative Grade to Investment Grade) (1998-2018)**

| Indicator | During/Post event | Short Term | | | Medium Term | | | Long Term | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sensex return | During event | -1.2% | | | 2.88% | | | 30% | | |
| | Post event | 0.4% | | | 0.76% | | | -5.1% | | |
| Exchange Rate | During event | 0.03% | | | -0.3% | | | -1.4% | | |
| | Post event | -0.02% | | | -0.7% | | | -6.6% | | |
| G Sec Yield | | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread | 5 yr | 10 yr | Spread |
| | During event | - | - | - | 0.4% | -0.3% | 6% | - | - | - |
| | Post event | - | - | - | 1.2% | 1.2% | 8% | - | - | - |
| FPI Flows** | | Equity | Debt | | Equity | Debt | | Equity | Debt | |
| | During event | - | - | | - | - | | 717% | 1654% | |
| | Post event | - | - | | - | - | | 61% | 29% | |

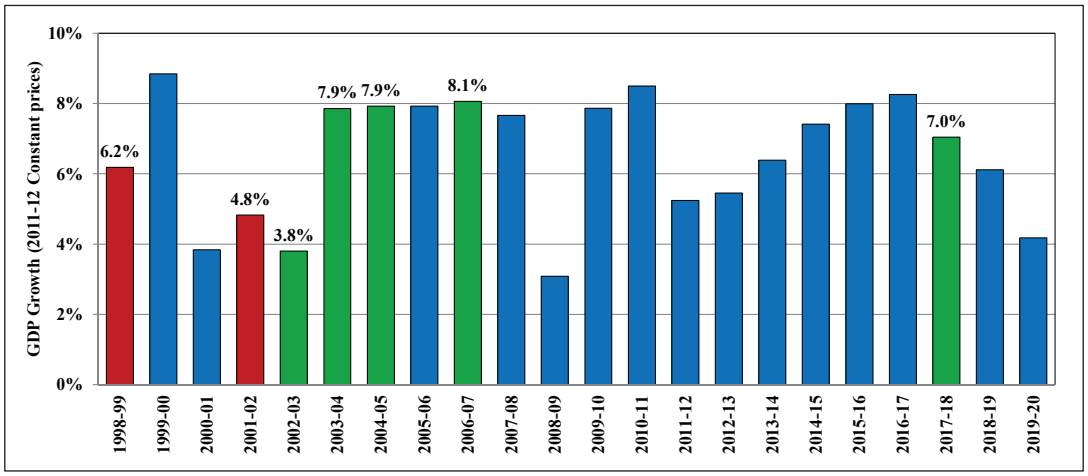
Note: Green indicates positive economic outcome, Red indicates negative economic outcome

## MACROECONOMIC INDICATORS AS DETERMINANTS OF SOVEREIGN CREDIT RATING CHANGES

3.46 We further examine the correlation between select fiscal and macro-economic indicators of India and episodes of sovereign credit ratings changes. Past episodes of rating changes have

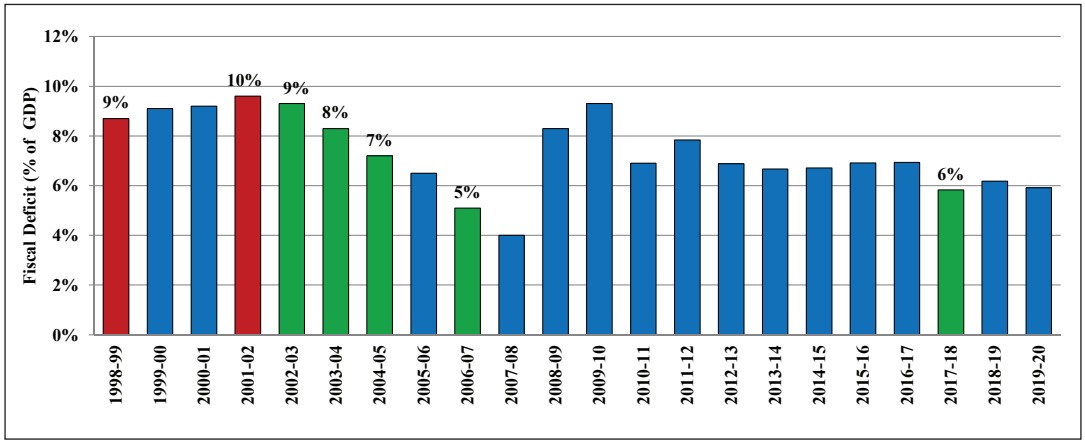
no or weak correlation with macroeconomic indicators. Figure 36 shows India's GDP Growth (at constant 2011-12 prices) in relation to sovereign credit rating changes during 1998-2020. There is no clear pattern between changes in GDP growth and sovereign credit rating changes.

**Figure 36: India's GDP Growth (2011-12 Constant Prices) and Sovereign Credit Rating Changes**




Note: Red signifies year of rating downgrade. Green signifies year of rating upgrade.
Source: MoSPI and RBI

**Figure 37: India's Fiscal Deficit (as per cent of GDP) and Sovereign Credit Rating Changes**

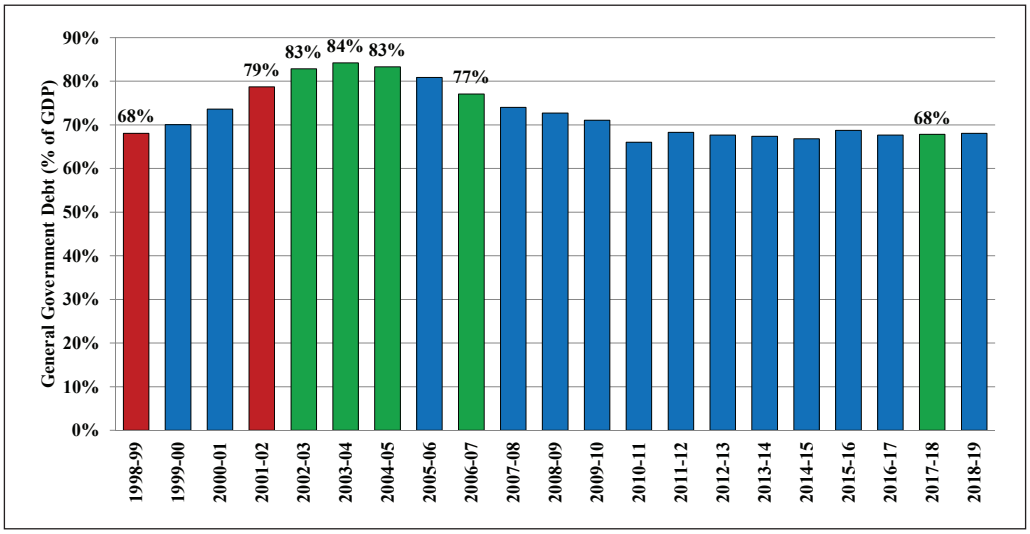



Note: Red signifies year of rating downgrade. Green signifies year of rating upgrade.
Source: RBI

3.47 Figure 37 shows India's Fiscal Deficit (as per cent of GDP) for Central and State Governments in relation to sovereign credit ratings changes during 1998-2020. All sovereign credit ratings upgrades occurred in years that witnessed lower fiscal deficit as compared to the previous year.

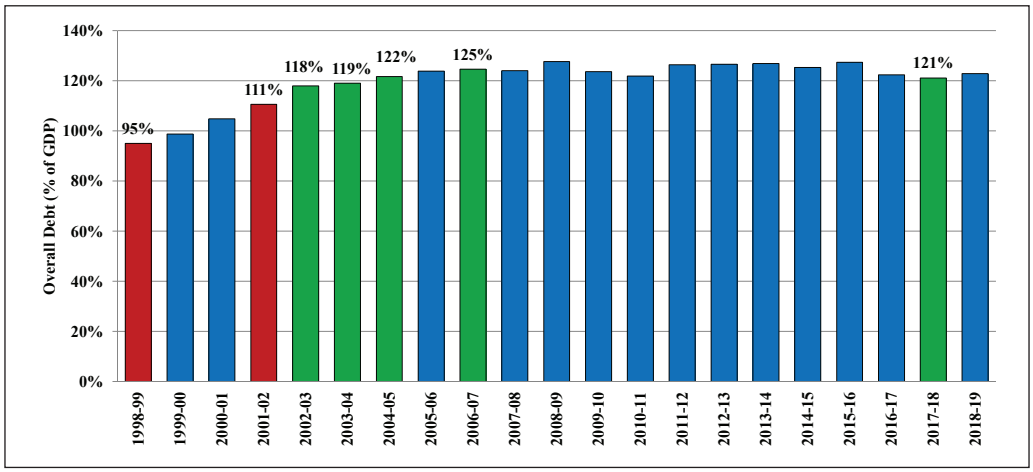
3.48 Figure 38 shows India's general government debt (as per cent of GDP) in relation to sovereign credit ratings changes during 1998-2019. Most sovereign credit rating upgrades occurred in years that witnessed higher or similar level of general government debt (as per cent of GDP) as the previous year.

**Figure 38: India's General Government Debt (as % of GDP) and Sovereign Credit Rating Changes**




Note: Red signifies year of rating downgrade. Green signifies year of rating upgrade.
Source: IMF

**Figure 39: India's Overall Debt (as per cent of GDP) and Sovereign Credit Rating Changes**

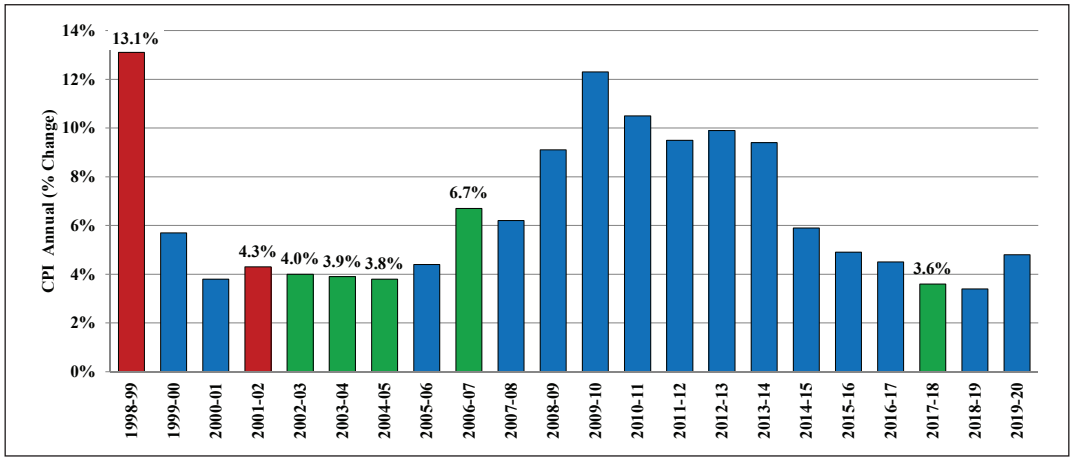



Note: Red signifies year of rating downgrade. Green signifies year of rating upgrade.
Source: IMF

3.49 Figure 39 shows India's overall debt (as per cent of GDP) in relation to sovereign credit ratings changes during 1998-2019. Most credit ratings upgrades occurred in years that witnessed higher overall debt as compared to the previous year.

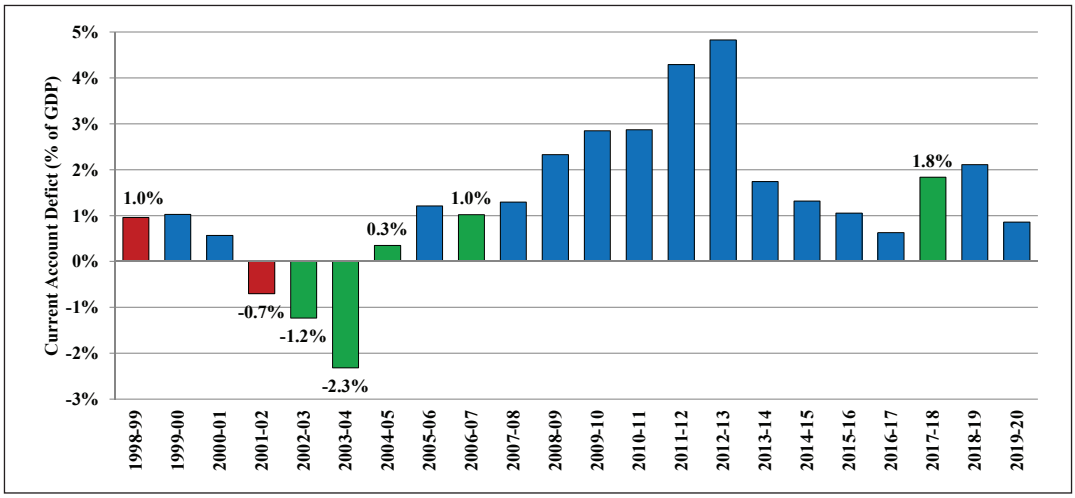
3.50 Figure 40 shows India's consumer price inflation (annual per cent change) in relation to sovereign credit ratings changes during 1998-2020. The pattern of correlation between inflation and changes in sovereign credit ratings is not clear.

**Figure 40: India's Consumer Price Inflation (Annual per cent Change) and Sovereign Credit Rating Changes**




Note: Red signifies year of rating downgrade. Green signifies year of rating upgrade.
Source: RBI and IMF

**Figure 41: India's Current Account Deficit (as per cent of GDP) and Sovereign Credit Rating Changes**

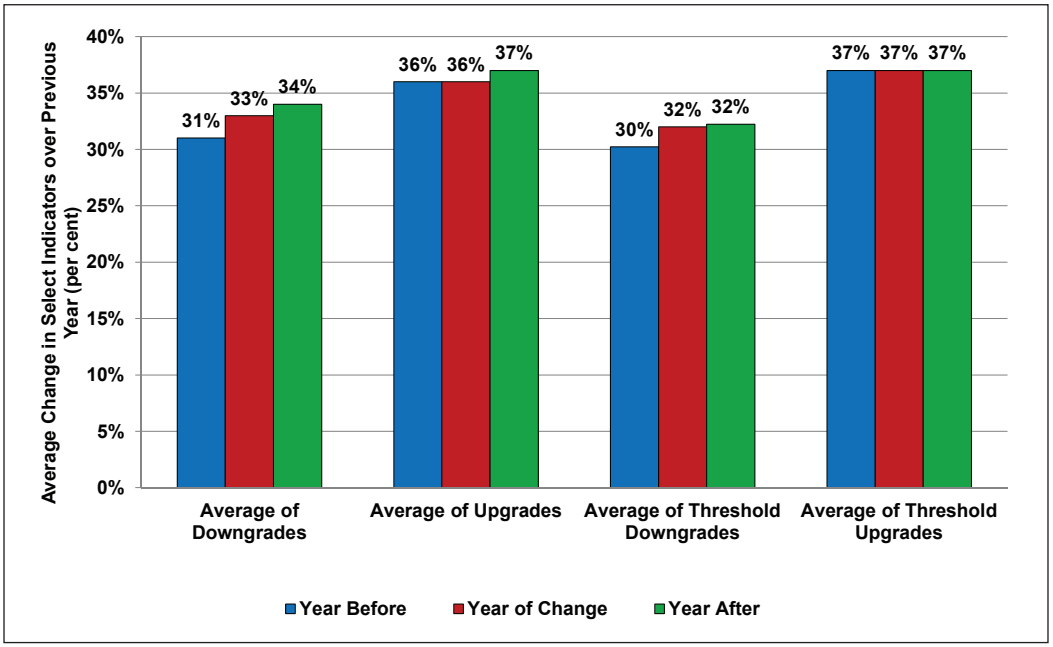



Note: Red signifies year of rating downgrade. Green signifies year of rating upgrade.
Source: RBI

3.51 Figure 41 shows India's current account deficit (as per cent of GDP) in relation to sovereign credit ratings changes during the period 1998-20. The pattern of correlation between sovereign credit rating changes and current account deficit is not clear.

3.52 Figure 42 shows the average change in annual performance of these macroeconomic indicators (GDP growth, fiscal deficit, general government debt, overall debt, inflation and current account deficit) before, during and after a sovereign credit ratings change. It may be seen that during years of India's sovereign credit rating changes, the average performance of macroeconomic indicators was better than or similar to the previous year. The average performance of macroeconomic indicators further improved or was similar in the year after the sovereign credit rating change.

**Figure 42: Average Change in Annual Macroeconomic Indicators and India's Sovereign Credit Rating Changes (1998-2018)**




Source: RBI, MoSPI, IMF and Survey Calculations

## Box 7: Methodology for Probit Regression of Determinants of India's Sovereign Credit Rating Upgrades and Downgrades

Using data from 1998-2019, we performed two probit regressions, one each for the event of a sovereign credit ratings downgrade and upgrade for India.

Table 6 below reports results for the following probit regression for India's sovereign credit ratings changes:

***Ratings Downgrade = $\beta_1$ Real GDP Growth Rate* (quarter-on-quarter growth) + $\beta_2$ Fiscal Deficit (annual, per cent of GDP) + $\beta_3$ Consumer Price Inflation (annual change, per cent)***

***Ratings Upgrade = $\beta_1$ Real GDP Growth Rate* (quarter-on-quarter growth) + $\beta_2$ Fiscal Deficit (annual, per cent of GDP) + $\beta_3$ Consumer Price Inflation (annual change, per cent)***

Where Ratings Downgrade = 1 for years when India's sovereign credit rating was downgraded by either S&P, Moody's or Fitch, and 0 otherwise

and Ratings Upgrade = 1 for years when India's sovereign credit rating was upgraded by either S&P, Moody's or Fitch, and 0 otherwise

*GDP quarterly data from RBI. Base year 2011-12 for 2011-19, base year 2004-05 for 2004-11 and base year 1999-2000 for 1998-04

3.53 Table 6 reports coefficients of probit regression for the event of a ratings downgrade and ratings upgrade based on three explanatory variables: GDP growth rate (quarter-on-quarter), fiscal deficit (annual, as per cent of GDP) and consumer price inflation (annual, per cent change). Of the three explanatory variables, fiscal deficit and consumer price inflation are found significant

in explaining India's sovereign credit ratings downgrades during 1998-2019. Only consumer price inflation is found significant in explaining India's sovereign credit ratings upgrades during 1998-2019.

**Table 6: Probit Regression Credit Ratings Downgrade and Upgrade**

| VARIABLES | (1) Dependant variable: Credit Rating Downgrade | (2) Dependant variable: Credit Rating Upgrade |
|---|---|---|
| **Real GDP Growth** | -0.0036 | 0.0135 |
| | (0.0274) | (0.0219) |
| **Fiscal Deficit** | 1.422*** | -0.135 |
| | (0.520) | (0.108) |
| **Consumer Price Inflation** | 0.150** | -0.391*** |
| | (0.0747) | (0.104) |
| **Constant** | -14.72*** | 2.356** |
| | (4.777) | (0.938) |
| **Observations** | 84 | 84 |
| **Wald chi2 (3)** | 9.325 | 16.47 |
| **Prob > chi2** | 0.0253 | 0.0009 |
| **Pseudo R2** | 0.4257 | 0.2334 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## POLICY IMPLICATIONS

3.54 The Survey questioned whether India's sovereign credit ratings reflect its fundamentals, and found evidence of a systemic under-assessment of India's fundamentals as reflected in its low ratings over a period of at least two decades. India's fiscal policy must, therefore, not remain beholden to such a noisy/biased measure of India's fundamentals and should instead reflect Gurudev Rabindranath Thakur's sentiment of a mind without fear. In other words, India's fiscal policy should be guided by considerations of growth and development rather than be restrained by biased and subjective sovereign credit ratings.

3.55 While sovereign credit ratings do not reflect the Indian economy's fundamentals, noisy, opaque and biased credit ratings damage FPI flows. Sovereign credit ratings methodology must be amended to reflect economies' ability and willingness to pay their debt obligations by becoming more transparent and less subjective. Developing economies must come together to address this bias and subjectivity inherent in sovereign credit ratings methodology to prevent exacerbation of crises in future.

3.56 The pro-cyclical nature of credit ratings and its potential adverse impact on economies, especially low-rated developing economies must be expeditiously addressed. India has already raised the issue of pro-cyclicality of credit ratings in G20. In response, the Financial Stability Board (FSB) is now focusing on assessing the pro-cyclicality of credit rating downgrades.

## CHAPTER AT A GLANCE

- Never in the history of sovereign credit ratings has the fifth largest economy in the world been rated as the lowest rung of the investment grade (BBB-/Baa3). Reflecting the economic size and thereby the ability to repay debt, the fifth largest economy has been predominantly rated AAA. China and India are the only exceptions to this rule – China was rated A-/A2 in 2005 and now India is rated BBB-/Baa3.

- India's sovereign credit ratings do not reflect its fundamentals. Within its sovereign credit ratings cohort – countries rated between A+/A1 and BBB-/Baa3 for S&P/ Moody's – India is a clear outlier on several parameters, i.e. it is rated significantly lower than mandated by the effect on the sovereign rating of the parameter. These include GDP growth rate, inflation, general government debt (as per cent of GDP), cyclically adjusted primary balance (as per cent of potential GDP), current account balance (as per cent of GDP), political stability, rule of law, control of corruption, investor protection, ease of doing business, short-term external debt (as per cent of reserves), reserve adequacy ratio and sovereign default history. This outlier status remains true not only now but also during the last two decades.

- Credit ratings map the probability of default and therefore reflect the willingness and ability of borrower to meet its obligations. India's willingness to pay is unquestionably demonstrated through its zero sovereign default history. India's ability to pay can be gauged not only by the extremely low foreign currency denominated debt of the sovereign but also by the comfortable size of its foreign exchange reserves that can pay for the short term debt of the private sector as well as the entire stock of India's sovereign and non-sovereign external debt. India's forex reserves can cover an additional 2.8 standard deviation negative event, i.e. an event that can be expected to manifest with a probability of less than 0.1 per cent after meeting all short-term debt.

- As ratings do not capture India's fundamentals, it comes as no surprise that past episodes of sovereign credit rating changes for India have not had major adverse impact on select indicators such as Sensex return, foreign exchange rate and yield on government securities. Past episodes of rating changes have no or weak correlation with macroeconomic indicators.

- India's fiscal policy, therefore, must not remain beholden to a noisy/biased measure of India's fundamentals and should instead reflect Gurudev Rabindranath Thakur's sentiment of a mind without fear.

- Despite ratings not reflecting fundamentals, they can however be pro-cyclical and can affect equity and debt FPI flows of developing countries, causing damage and worsening crisis. It is therefore imperative that sovereign credit ratings methodology be made more transparent, less subjective and better attuned to reflect economies' fundamentals.

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# APPENDIX

## Moody's Credit Ratings Methodology

**Sovereign Bond Ratings Sector Scorecard Overview**

| Factor | Sub-factor | Sub-factor Weighting | Metric/Sub-sub-factor | Metric / Sub-sub-Factor Weighting |
|---|---|---|---|---|
| Factor: Economic Strength | Growth Dynamics | 35% | Average Real GDP Growth $_{t-4\ to\ t+5}$ | 25% |
| | | | Volatility in Real GDP Growth $_{t-9\ to\ t}$ | 10% |
| | Scale of the Economy | 30% | Nominal GDP (US$ bn) $_t$ | 30% |
| | National Income | 35% | GDP per Capita (PPP, Int. USD) $_t$ | 35% |
| | Adjustment to Factor Score | 0 - 9 notches | Other | |
| Factor: Institutions and Governance Strength | Quality of Institutions | 40% | Quality of Legislative and Executive Institutions | 20% |
| | | | Strength of Civil Society and the Judiciary | 20% |
| | Policy Effectiveness | 60% | Fiscal Policy Effectiveness | 30% |
| | | | Monetary and Macroeconomic Policy Effectiveness | 30% |
| | Adjustment to Factor Score | 0 - 3 notches | Government Default History and Track Record of Arrears | |
| | | 0 - 3 notches | Other | |
| Factor: Fiscal Strength | Debt Burden | 50%[1] | General Government Debt / GDP $_t$ | 25% |
| | | | General Government Debt / Revenue $_t$ | 25% |
| | Debt Affordability | 50%[1] | General Government Interest Payments / Revenue $_t$ | 25% |
| | | | General Government Interest Payments / GDP $_t$ | 25% |
| | Adjustments to Factor Score | 0 - 6 notches | Debt Trend $_{t-4\ to\ t+1}$ | |
| | | | General Government Foreign Currency Debt / General Government Debt $_t$ | |
| | | | Other Non-Financial Public Sector Debt / GDP $_t$ | |
| | | | Public Sector Financial Assets and Sovereign Wealth Funds / General Government Debt $_t$ | |
| | | 0 - 3 notches | Other | |
| Factor: Susceptibility to Event Risk | Political Risk | Minimum Function[2] | Domestic Political and Geopolitical Risk | |
| | Government Liquidity Risk | Minimum Function[2] | Ease of Access to Funding | |
| | | | 0 - 2 scoring categories | Adjustment to Sub-factor Score High Refinancing Risk |
| | Banking Sector Risk | Minimum Function[2] | Risk of Banking Sector Credit Event (BSCE) | |
| | | | Total Domestic Bank Assets / GDP $_t$ | |
| | | | 0 - 2 scoring categories | Adjustment to Sub-factor Score |
| | External Vulnerability Risk | Minimum Function[2] | External Vulnerability Risk | |
| | | | 0 - 2 scoring categories | Adjustment to Sub-factor Score |
| | Adjustment to Factor Score | 0-2 scores | | |

Source: Moody's

**Fitch's Credit Ratings Methodology**

## Sovereign Analytical Pillars – SRM Weights

| Analytical pillar | Structural features | Macroeconomic performance, policies & prospects | Public finances | External finances |
|---|---|---|---|---|
| SRM weights (%) | 53.7 | 10.9 | 18.0 | 17.4 |

| SRM variables | Measure | Impact | Weight (%) | Coefficient |
|---|---|---|---|---|
| Governance indicators | Latest | Positive | 20.4 | 0.075 |
| GDP per capita | Latest | Positive | 12.3 | 0.040 |
| Share in world GDP | Latest | Positive correlation with size | 13.2 | 0.607 |
| Years since default or restructuring event | Latest | Negative | 6.4 | -2.481 |
| Broad money supply (% of GDP) | Latest | Positive | 1.4 | 0.185 |
| **Overall weight in SRM** | | | 53.7 | |

| SRM variables (%) | Measure | Impact | Weight (%) | Coefficient |
|---|---|---|---|---|
| Real GDP growth volatility | Latest | Negative | 4.9 | -0.767 |
| Consumer price inflation | 3-year centred average | Negative | 3.1 | -0.056 |
| Real GDP growth | 3-year centred average | Positive | 2.9 | 0.093 |
| **Overall weight in SRM** | | | 10.9 | |

| SRM variables | Measure | Impact | Weight (%) | Coefficient |
|---|---|---|---|---|
| Gross general govt debt/GDP | 3-year centred avg | Negative | 8.0 | -0.021 |
| General govt interest (% of revs) | 3-year centred avg | Negative | 4.7 | -0.046 |
| General govt fiscal bal./GDP | 3-year centred avg | Directional | 3.0 | 0.055 |
| FC govt debt/gross govt debt (%) | 3-year centred avg | Negative | 2.4 | -0.006 |
| **Overall weight in SRM** | | | 18.0 | |

| SRM variables | Measure | Impact | Weight (%) | Coefficient |
|---|---|---|---|---|
| Reserve currency flexibility | Latest | Positive | 7.8 | 0.551 |
| Sovereign net foreign assets (% of GDP) | 3-year centred avg. | Positive | 6.7 | 0.011 |
| Commodity dependence | Latest | Negative | 0.8 | -0.003 |
| Foreign exchange reserves (months of CXP)[a] | Latest | Positive | 1.3 | 0.027 |
| External interest service (% of CXR) | 3-year centred avg. | Negative | 0.7 | -0.012 |
| Current account balance + foreign direct investment (% of GDP) | 3-year centred avg. | Directional | 0.2 | 0.002 |
| **Overall weight in SRM** | | | 17.4 | |

Source: Fitch

# Inequality and Growth: Conflict or Convergence?

04
CHAPTER

**Poverty is the parent of revolution and crime.**

**—Aristotle**

*The Economic Survey 2019-20 argued that ethical wealth creation – by combining the invisible hand of markets with the hand of trust – provides the way forward for India to develop economically. An often-repeated concern expressed with this economic model pertains to inequality. Some commentary, especially in advanced economies post the Global Financial Crisis, argues that inequality is no accident but an essential feature of capitalism. Such commentaries, thus, highlight a potential conflict between economic growth and inequality. Could the fact that both the absolute levels of poverty and the rates of economic growth are low in advanced economies generate this conflict? If so, could it be that a developing economy such as India can avoid this conflict – at least in the near future – because of the potential for high economic growth, on the one hand, and the significant scope for lifting millions out of poverty, on the other hand? This question becomes pertinent especially because of the inevitable focus on inequality following the COVID-19 pandemic.*

*In this chapter, the Survey examines if inequality and growth conflict or converge in the Indian context. By examining the correlation of inequality and per-capita income with a range of socio-economic indicators, including health, education, life expectancy, infant mortality, birth and death rates, fertility rates, crime, drug usage and mental health, the Survey highlights that both economic growth – as reflected in the income per capita at the state level –and inequality have similar relationships with socio-economic indicators. Thus, unlike in advanced economies, in India economic growth and inequality converge in terms of their effects on socio-economic indicators. Furthermore, this chapter finds that economic growth has a far greater impact on poverty alleviation than inequality. Therefore, given India's stage of development, India must continue to focus on economic growth to lift the poor out of poverty by expanding the overall pie. Note that this policy focus does not imply that redistributive objectives are unimportant, but that redistribution is only feasible in a developing economy if the size of the economic pie grows.*

## INTRODUCTION

4.1 The Economic Survey 2019-20 argued that ethical wealth creation – by combining the invisible hand of markets with the hand of trust – provides the way forward for India to develop economically. An often repeated concern expressed with this economic model pertains to inequality. In the advanced economies, Wilkinson and Pickett (2009), Atkinson (2014) and Piketty (2020) show that higher inequality leads to adverse socio-economic outcomes but income per capita, a measure that reflects the impact of economic growth, has little impact. Some commentary, especially in advanced economies post the Global Financial Crisis, argues that inequality is no accident but an essential feature of capitalism. Such commentaries, thus, highlight a potential conflict between economic growth and inequality[1]. The significant reduction in poverty that high economic growth has delivered in India and China presents the most striking challenge to this notion of conflict between economic growth and inequality. Could the fact that both the absolute levels of poverty and the rates of economic growth are low in advanced economies generate this conflict? If so, could it be that a developing economy such as India can avoid this conflict because of the potential for high levels of economic growth, on the one hand, and the significant scope for poverty reduction, on the other hand, ? This question becomes pertinent especially because of the inevitable focus on inequality following the COVID-19 pandemic.

4.2 The question remained important for India even before the pandemic. Choices in economic policy always present inherent trade-offs. Resolving these trade-offs in a manner that suits the specific economic context of the day is, therefore, critical to lay out clear policy objectives. The advanced economies may choose to focus on alleviating inequality given their stage of development, their potential rate of economic growth and the absolute levels of poverty that they face. Thus, they may resolve the trade-off between growth and inequality by leaning towards alleviating inequality. However, despite facing the same trade-off, the policy objective of focusing on inequality may not apply in the Indian context given the differences in the stage of development, India's higher potential rate of economic growth and the higher absolute levels of poverty. Given these motivations, in this chapter, the Survey examines if inequality and growth conflict or converge in the Indian context in an effort to identify the correct policy objective for India.

4.3 By examining the correlation of inequality and per-capita income, which reflects the impact of economic growth, with a range of socio-economic indicators, the Survey highlights that both economic growth and inequality have similar relationships with socio-economic indicators. Thus, unlike in advanced economies, in India economic growth and inequality converge in terms of their effects on socio-economic indicators. Furthermore, this chapter finds that economic growth has a far greater impact on poverty alleviation than inequality. Therefore, given India's stage of development, India must continue to focus on economic growth to lift the poor out of poverty by expanding the overall pie. Note that this policy focus does not imply that

[1]See Wilkinson and Pickett, 2009; Picketty, 2013 among others for the research on inequality, mostly focused on advanced economies.

redistributive objectives are unimportant, but that redistribution is only feasible in a developing economy if the size of the economic pie grows. In sum, for a developing country such as India, where the growth potential is high and the scope for poverty reduction is also significant, the focus must continue on growing the size of the economic pie rapidly at least for the foreseeable future.

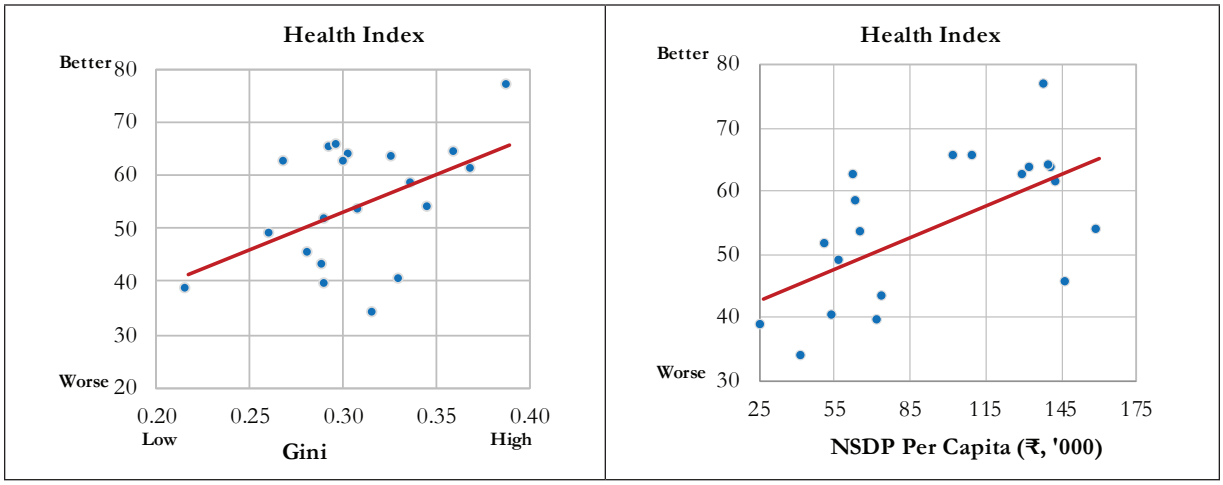
## GROWTH, INEQUALITY, AND SOCIO-ECONOMIC OUTCOMES: INDIA VERSUS THE ADVANCED ECONOMIES

4.4 In the advanced economies, Wilkinson and Pickett (2009), Atkinson (2014) and Piketty (2020) show that higher inequality leads to adverse socio-economic outcomes but income per capita, a measure of economic growth, has little impact. This section examines whether these findings apply to India. For this purpose, Figures 1-7 display simultaneously the correlation of socio-economic outcomes with inequality and income per capita across advanced economies and across Indian states. In each figure, the top panel displays these correlations for the Indian states while the bottom panel displays the same for the advanced economies; the chart on the left displays the correlation with inequality while the chart on the right displays the same with income per capita. These figures demonstrate clearly across a range of socio-economic outcomes the stark contrast between India and the advanced economies in the correlation of socio-economic outcomes with inequality and income per capita. Across the Indian states, it is observed that both inequality and income per capita correlate similarly with socio-economic outcomes. In these figures, inequality across Indian states is measured as the Gini coefficient of consumption. As it is demonstrated in the Appendix to the chapter, the results remain robust to using other measures of inequality.

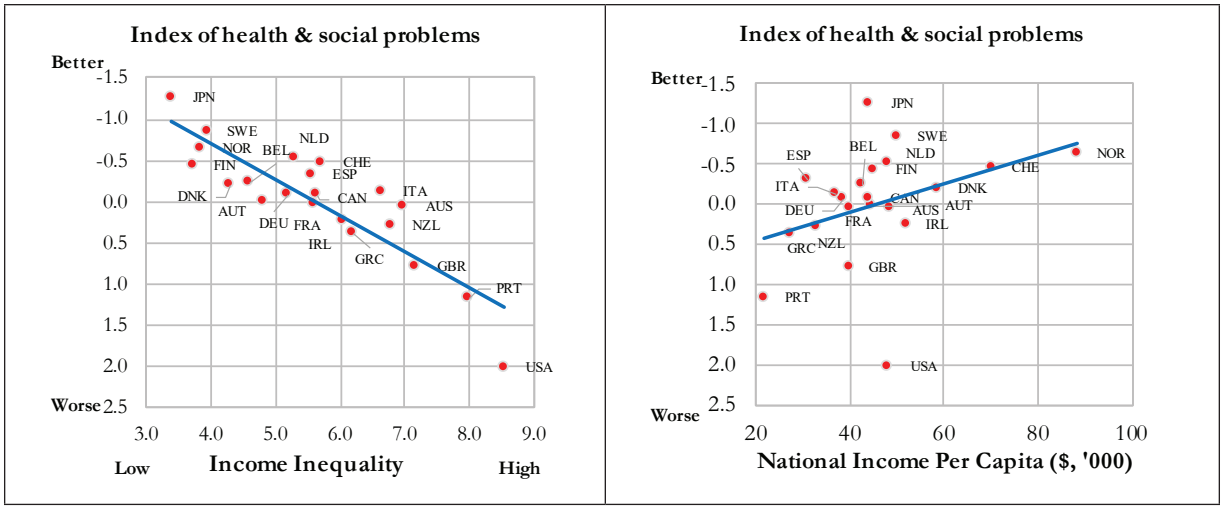
4.5 Figure 1 shows clearly that the index of health outcomes correlates positively with both inequality and income per capita across the Indian states. However, across the advanced economies, inequality correlates negatively with the index of health and social outcomes while income per capita correlates positively. Thus, while the conflict between growth and inequality is clearly seen across the advanced economies, inequality and growth converge in their effects on health among Indian states. Figures 2-5 show the same result using the index of education, life expectancy, infant mortality and crime respectively. It is clearly evident from Figure 6 that neither inequality nor income per capita among Indian states correlate strongly with drug usage; however, inequality correlates strongly with drug usage in the advanced economies. On mental health, Figure 7 shows that the effects of inequality and income per capita remain similar across the Indian states and the advanced economies.

**Figure 1: Correlation of inequality and growth (as reflected in income per capita) with health outcomes: India versus Advanced Economies**

*States in India*



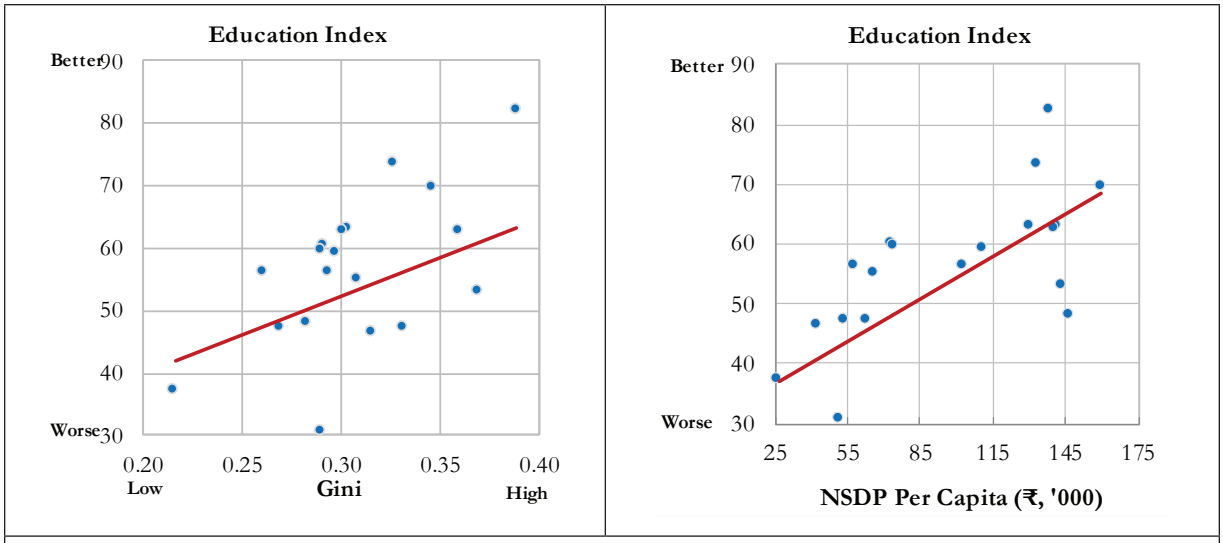

*Advanced Economies*



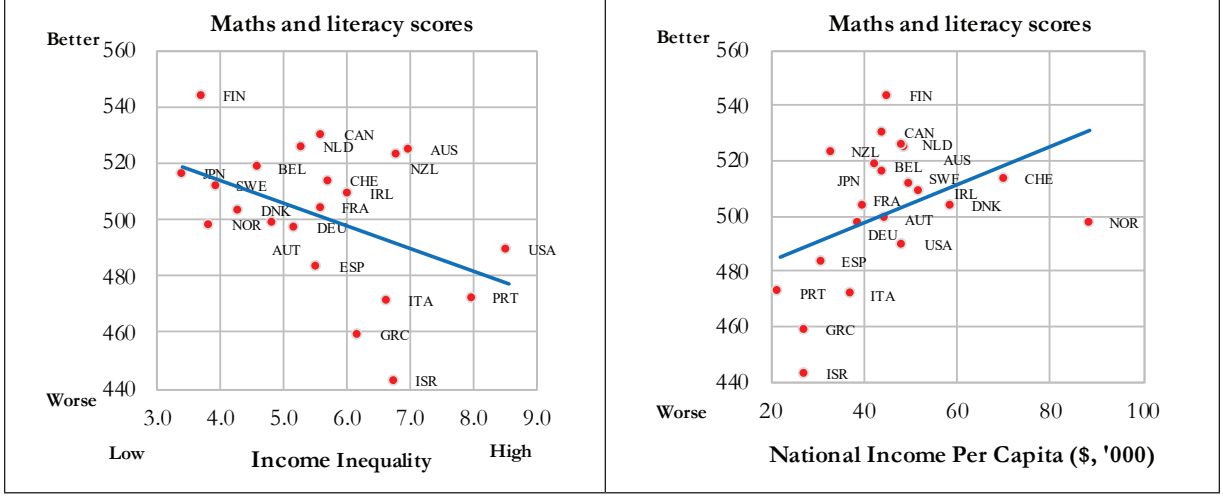

Source: States in India: Health Index (2017-18) is from NITI Aayog, Inequality is measured by the Gini coefficient based on consumption (from NSS database 2011) and growth by per capita Net State Domestic Product (NSDP) 2017-18 in Rupees at constant prices, MoSPI. (Note: Health Index is a composite score incorporating 23 indicators covering key aspects of health sector performance., measured on a scale of 0-100, higher score indicating better performance). Advanced Economies: The index of health and social problems is a composite index including components like distrust, mental illness, life expectancy, and obesity etc (Data for each component is collected from a distinct source, http://www.equalitytrust.org.uk/why/evidence/methods for details on the construction of the Index, and references for all components listed above), Inequality is measured by Average of the 20:20 (the ratio of top 20 per cent to bottom 20 per cent) income inequality published in the United Nations Development Program. Human development reports for years 2003, 2004, 2005, 2006, Oxford University Press: New York.

**Figure 2: Correlation of inequality and growth (as reflected in income per capita) with education outcomes: India versus Advanced Economies**

*States in India*




*Advanced Economies*

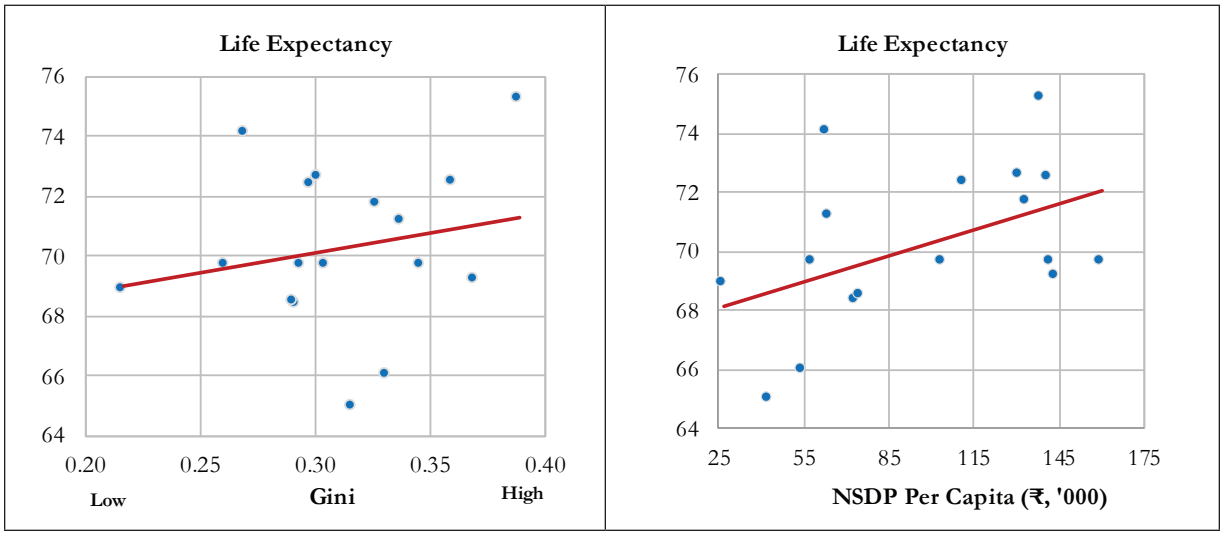



Source: States in India: Education Index (2016-17) from NITI Aayog, (Note: SEQI (School education Quality Index) is based on a set of indicators that measure the overall effectiveness, quality and efficiency of the Indian school education system, measured on a scale of 0-100, higher score indicating better performance). Advanced Economies: Maths and literacy scores (2003) from OECD, Education at a glance 2003, in OECD Indicators. 2004, OECD: Paris.

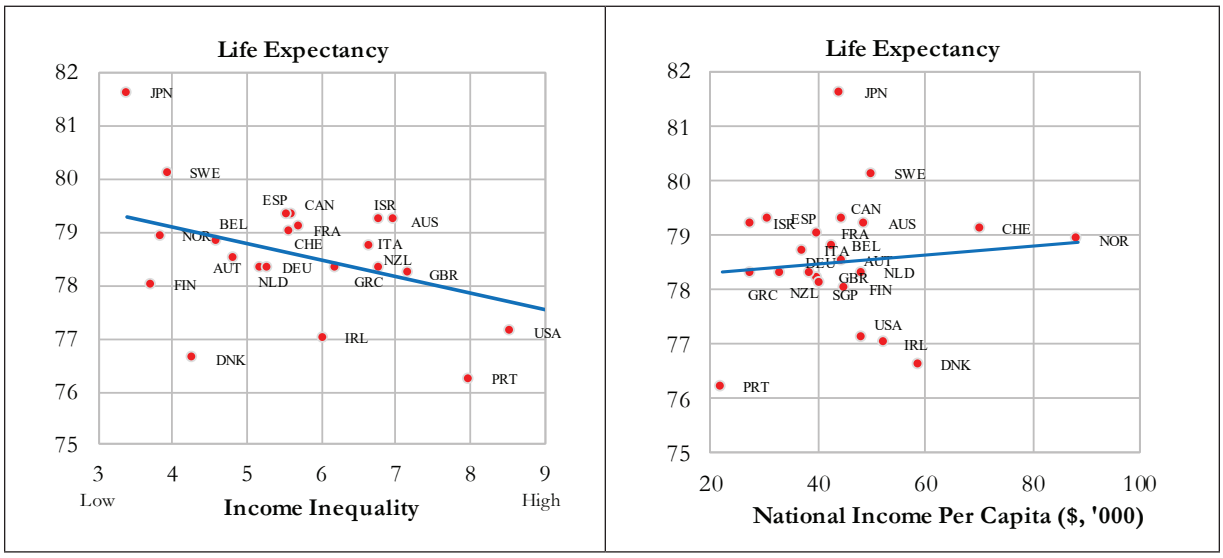
Note: These are the combined maths and reading literacy scores of 15 year olds

**Figure 3: Correlation of inequality and growth (as reflected in income per capita) with life expectancy: India versus Advanced Economies**

*States in India*



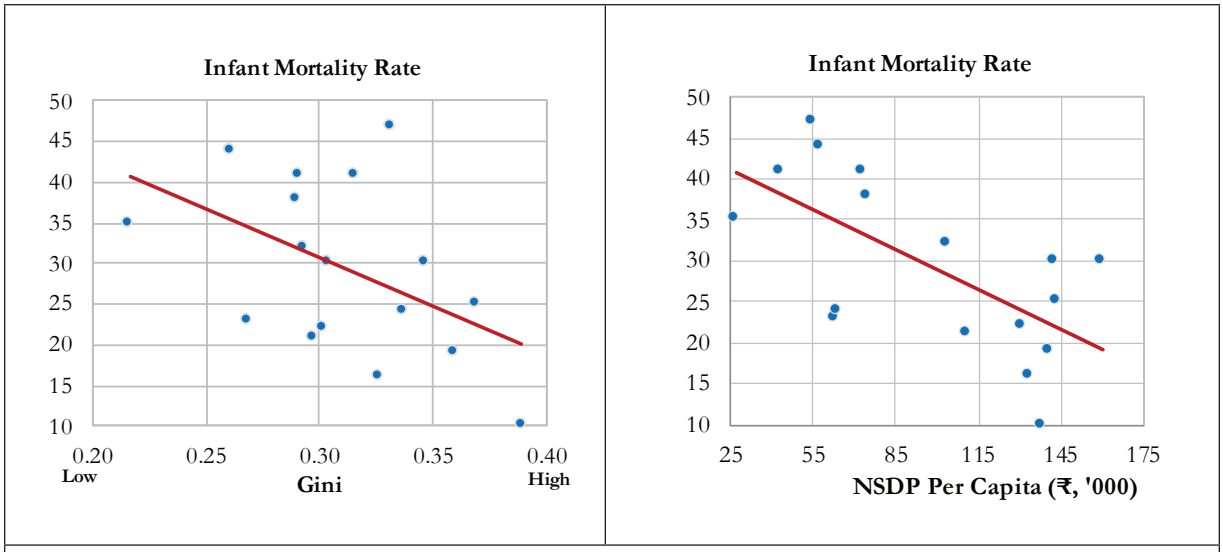

*Advanced Economies*



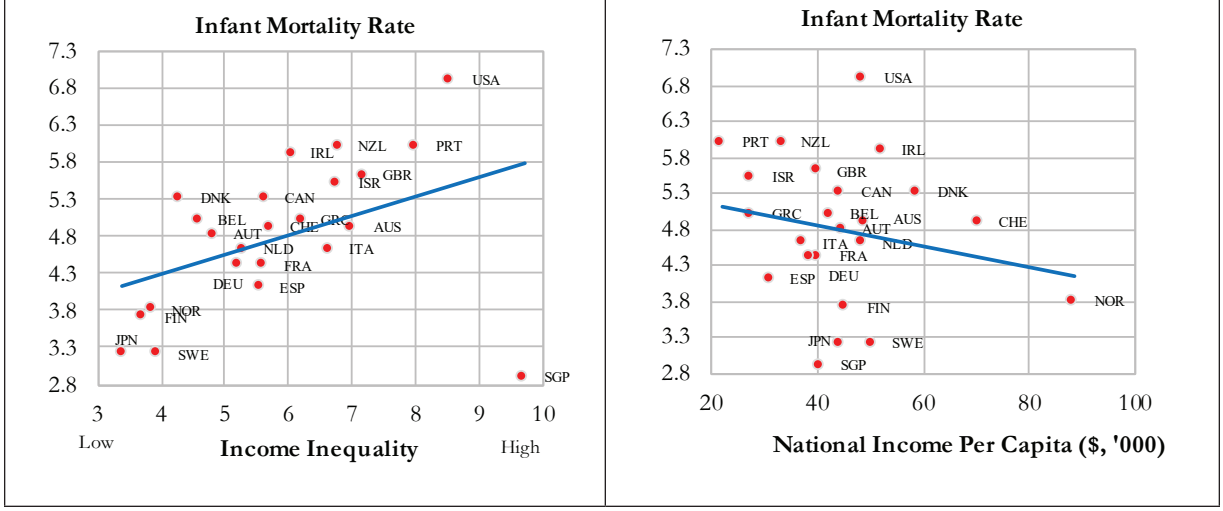

Source: States in India: Life Expectancy (2013-17) from Office of the Registrar General of India, Ministry of Home Affairs. Note: Life expectancy at birth indicates the number of years a new born infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Advanced Economies: UN Human Development Report (2004).

**Figure 4: Correlation of inequality and growth (as reflected in income per capita) with infant mortality: India versus Advanced Economies**

*States in India*



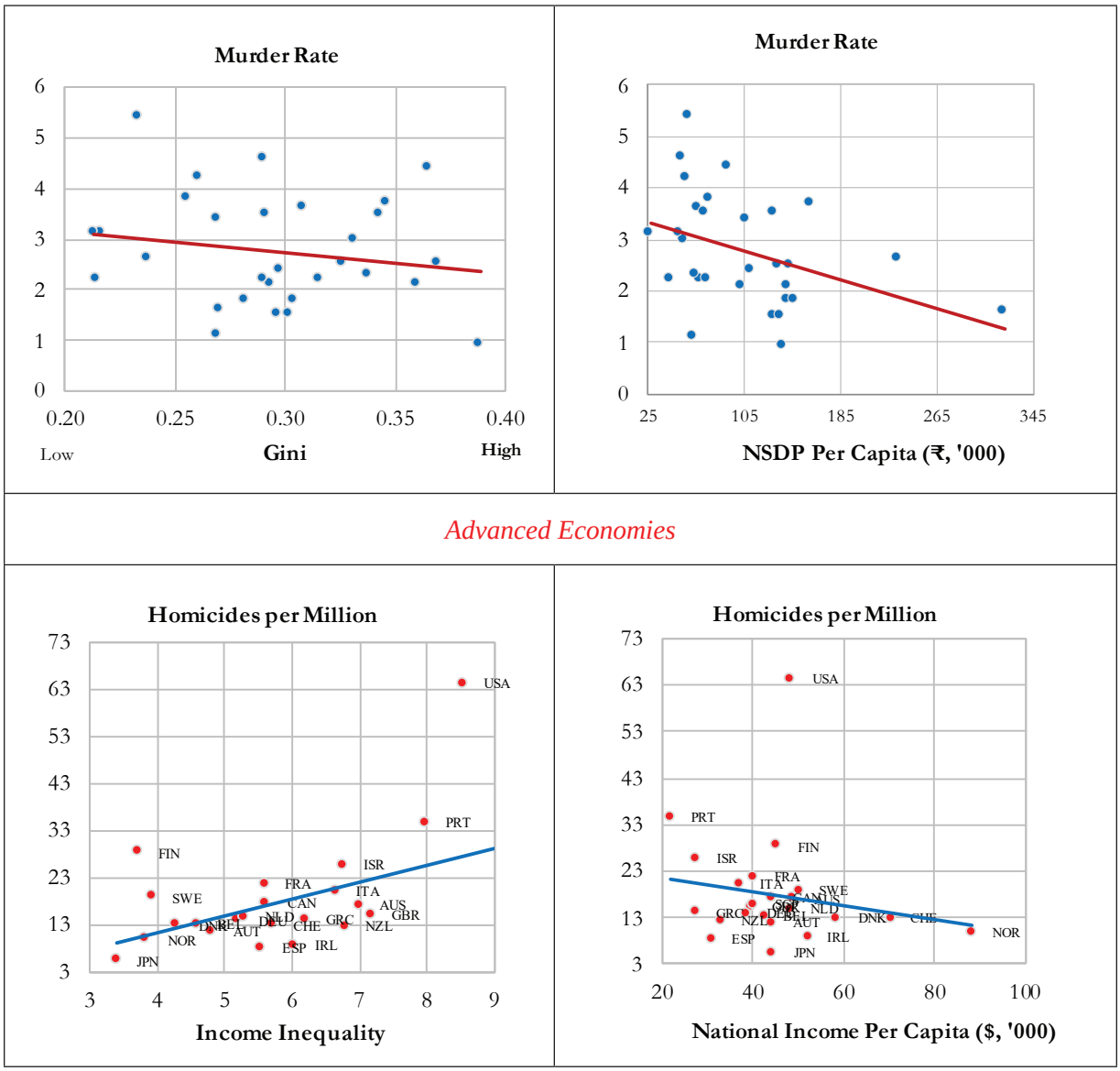

*Advanced Economies*




Source: States in India: Infant Mortality Rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs. Note: It is defined as the infant deaths (less than 1 year) per thousand live births. Advanced Economies: Infant Mortality Rate (2005) from OECD, UNICEF Innocent Research Centre, Child poverty in perspective: An overview of child well-being in rich countries.

**Figure 5: Correlation of inequality and growth (as reflected in income per capita) with crimes: India versus Advanced Economies**

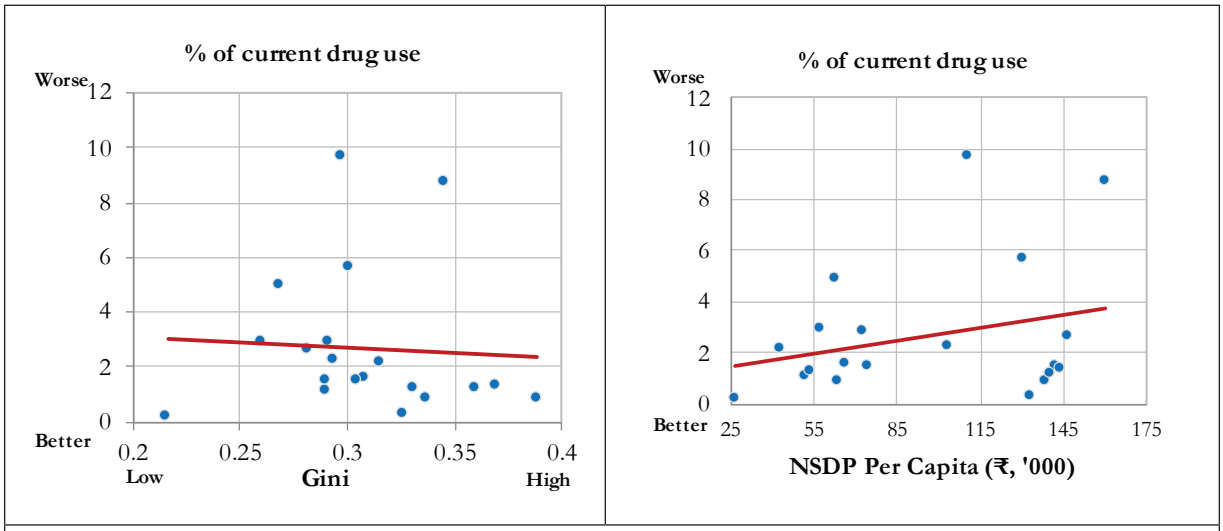
*States in India*



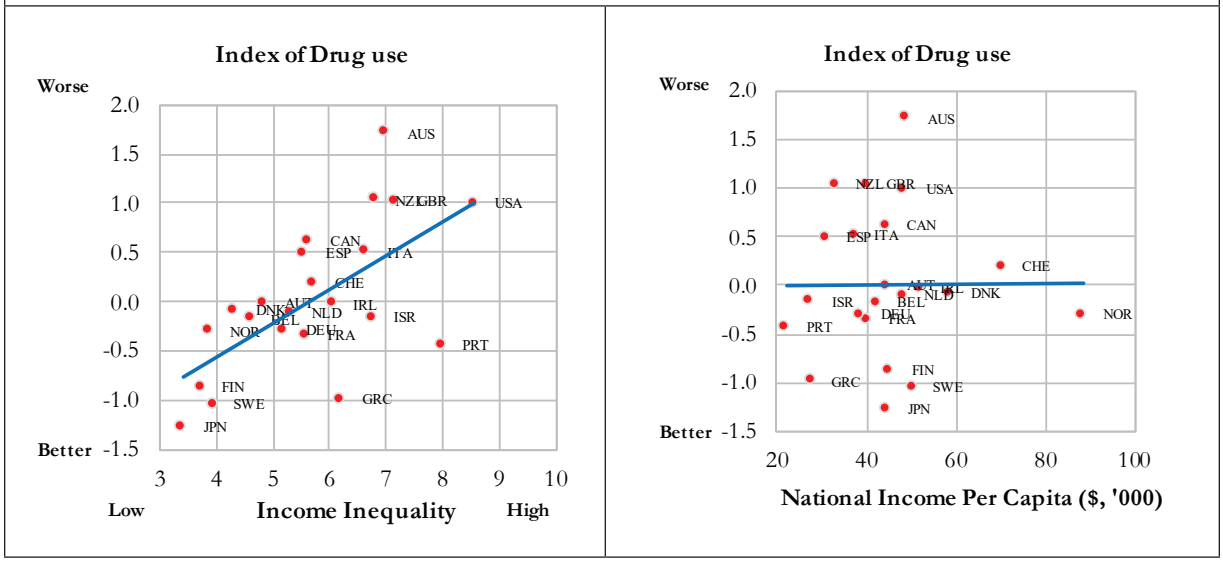

Source: States in India: Crime data (2015) from National Crime Records Bureau, Ministry of Home Affairs. Advanced Economies: Homicides per million, period average for 1999-2000, United Nations Crime and Justice Information Network.

**Figure 6: Correlation of inequality and growth (as reflected in income per capita) with drug usage: India versus Advanced Economies**

*States in India*




*Advanced Economies*

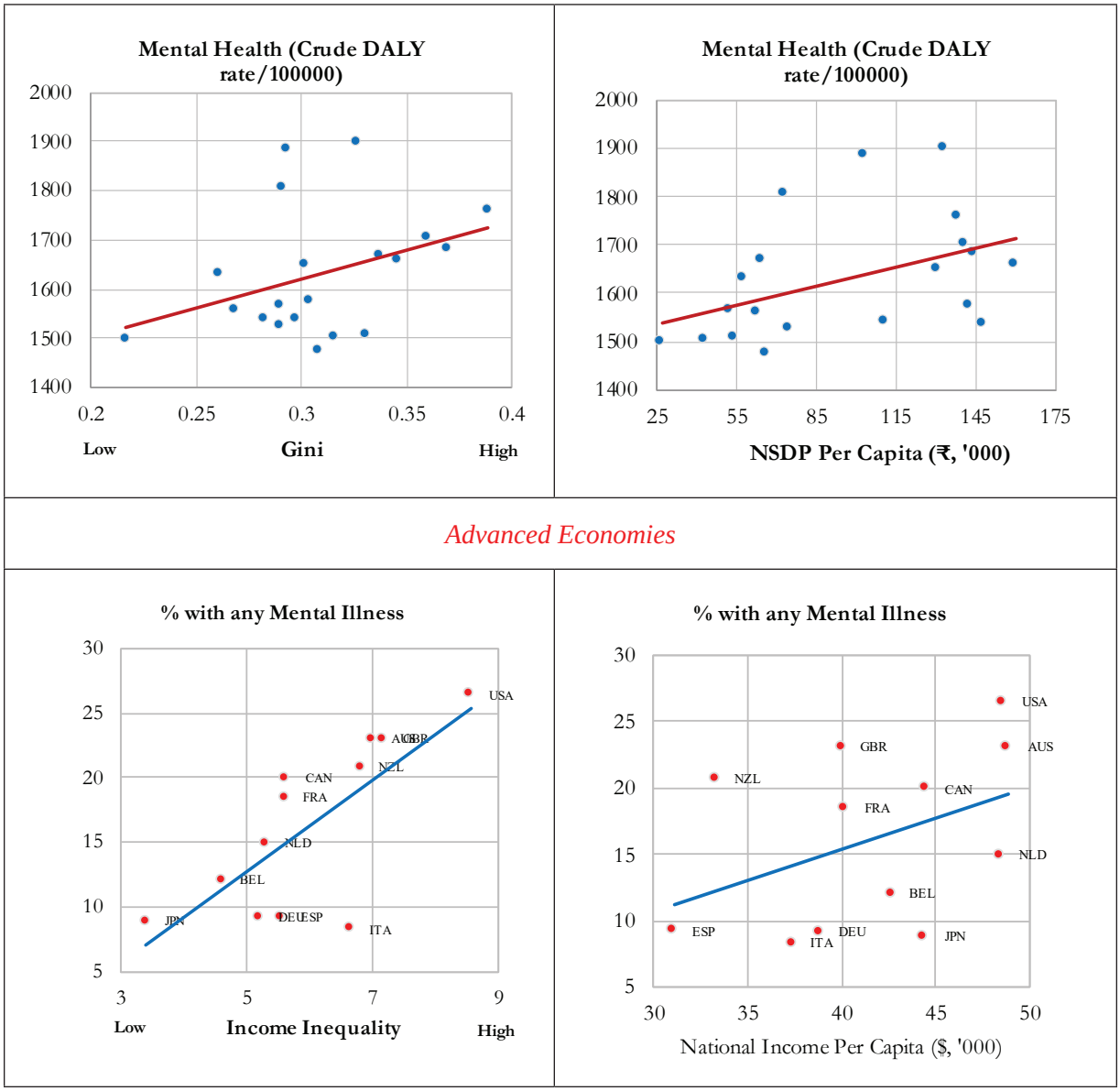



Source: States in India: Drug usage data (2018), Magnitude of Substance Use in India, Ministry of Social Justice and Empowerment, Government of India (2019). Note: Opioids consumption data is used. OPIOIDS refers to Opium (including doda/phukki/poppy husk), Heroin (including brown sugar/smack) and Pharmaceutical Opioids. Current use of any substance is defined as use (even once) within preceding 12 months unless specified. Advanced Economies: United Nations Office on Drugs and Crime (2007).

Note: It is an index of opiate, cocaine, cannabis, ecstasy and amphetamine use (average z-scores).

**Figure 7: Correlation of inequality and growth (as reflected in income per capita) with mental health outcomes: India versus Advanced Economies**

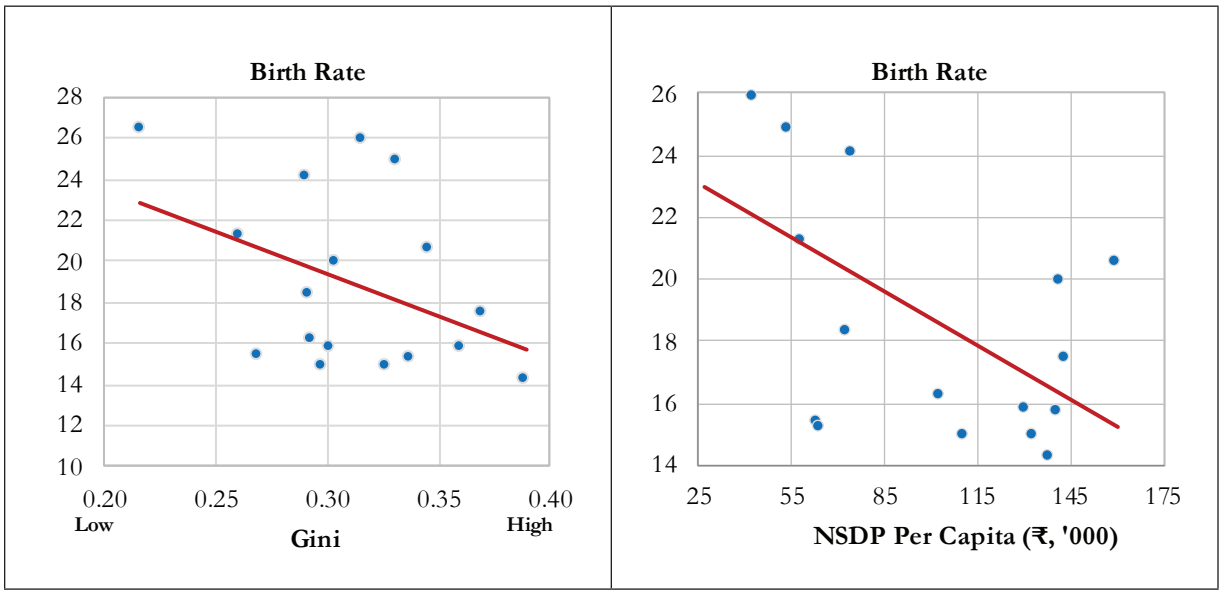
*States in India*




Source: States in India: Mental Health data (2017), Lancet Psychiatry (2020). The burden of mental disorders across the states of India: the Global Burden of Disease Study 1990–2017. Note: the mental health indicator is a composite indicator including Crude DALY i.e. (The disability-adjusted life year)- a measure of overall disease burden, expressed as the number of years lost due to ill-health- from various mental issues like depressive disorders, anxiety disorders. Advanced Economies: Mental Illness (2001-2003), World Health Organization and official national surveys for Australia, New Zealand and Canada.
Note: This measures the prevalence of any mental illness in previous 12 months in adults.

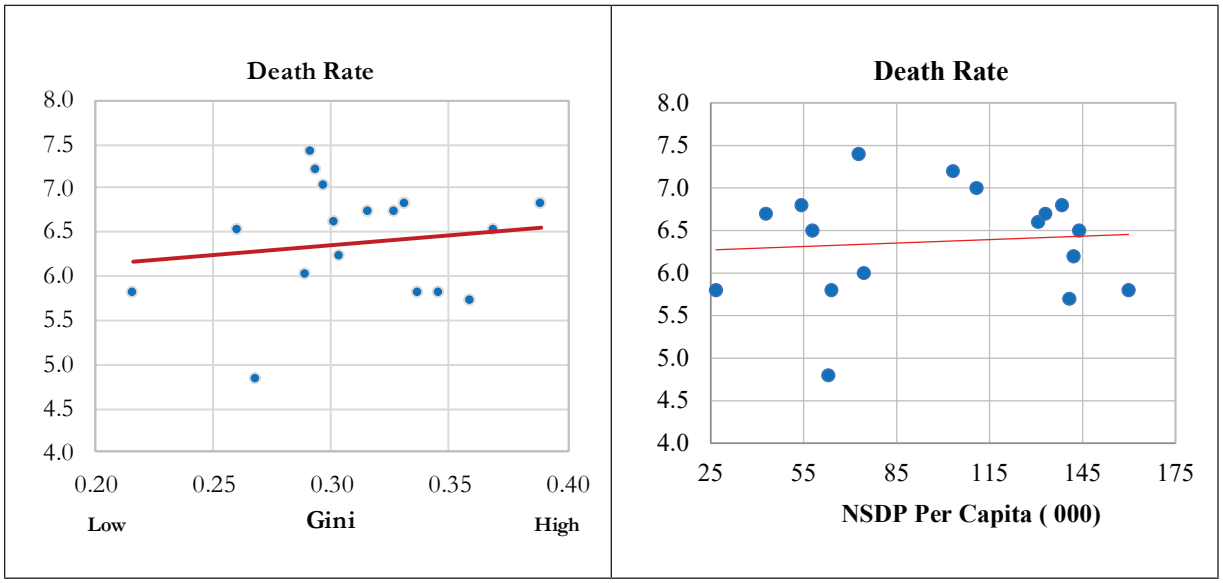
4.6 In addition, figures 8-10 use birth, death and fertility rates to argument the finding that inequality and income per capita correlate similarly with socio-economic outcomes across the Indian states. While birth and fertility rates decline with inequality and income per capita, death rates do not correlate with either inequality or income per capita.

**Figure 8: Correlation of inequality and growth (as reflected in income per capita) with birth rate in Indian States**



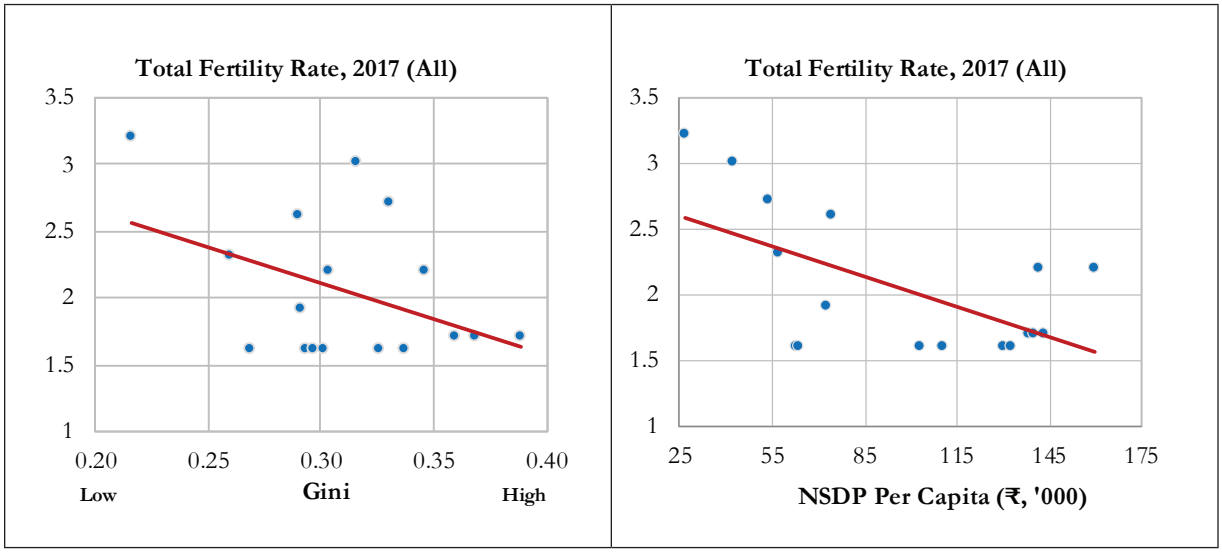

Source: Birth Rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 9: Correlation of inequality and growth (as reflected in income per capita) with death rate in Indian States**




Source: Death Rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 10: Correlation of inequality and growth (as reflected in income per capita) with total fertility rate in Indian States**




Source: Total fertility rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Are the patterns similar across different types and measures of inequality and different time periods?**

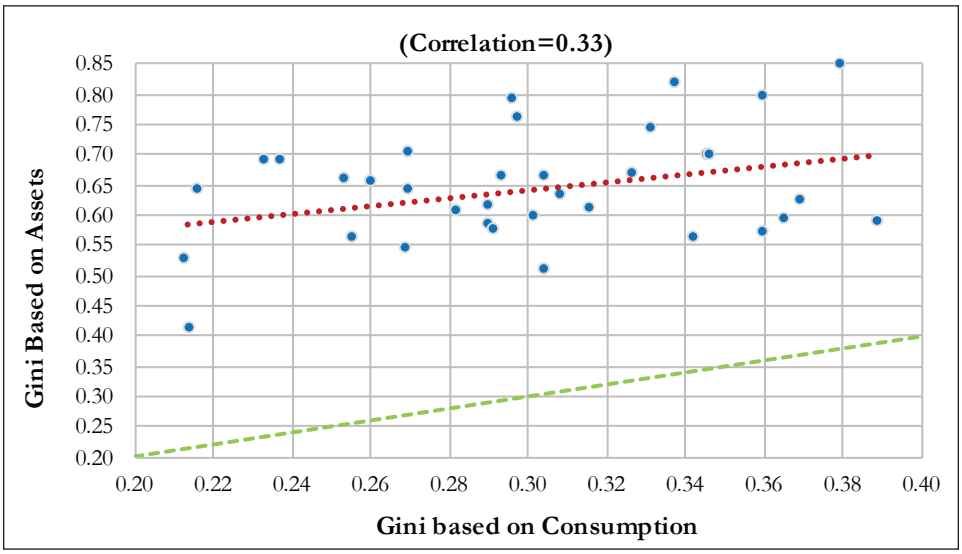
4.7 Figure 11 depicts the relationship between the two types of inequality in Indian states i.e., the inequality in the ownership of asset measured by the Gini coefficients based of assets and inequality of consumption measured by the consumption based Gini. The graph suggests a weak positive (0.33) relationship between the two inequalities in India, implying that the states with greater consumption inequality are the ones facing greater asset inequality as well. Further, the line of equality or the 45º line is used to conclude that in Indian states, asset inequality is much higher than consumption inequality as the all the data points lie far above the line of perfect equality. Inequality of consumption is what matters the most rather than inequality of assets or inequality of income. The permanent income hypothesis posits that individuals and households attempt to smooth their consumption over time by borrowing or saving. Thus, while the income of an individual varies from year to year, consumption is more permanent as individuals tend to smooth their consumption over time. Measures of calculating income do not take into consideration all the available resources that result into well-being. Further, savings and borrowing practices vary across the income groups as the propensity to save is typically higher among the rich than among the poor. Therefore, inequality of income does not reflect the true inequality that individuals and households as consumers encounter.[2] Second, in the context of inequality, the divergence in assets among the rich and the poor do not necessarily correlate strongly with the divergence in consumption (Cochrane, 2020).

4.8 As shown in Appendix A, the correlation between socio-economic indicators and inequality are robust irrespective of the measure of inequality used - Gini coefficient based on

[2]Meyer Bruce. When It Comes to Inequality Consumption is What Matters. Income Inequality in America: Myths and Facts. https://economics21.org/html/when-it-comes-inequality-consumption-what-matters-978.html

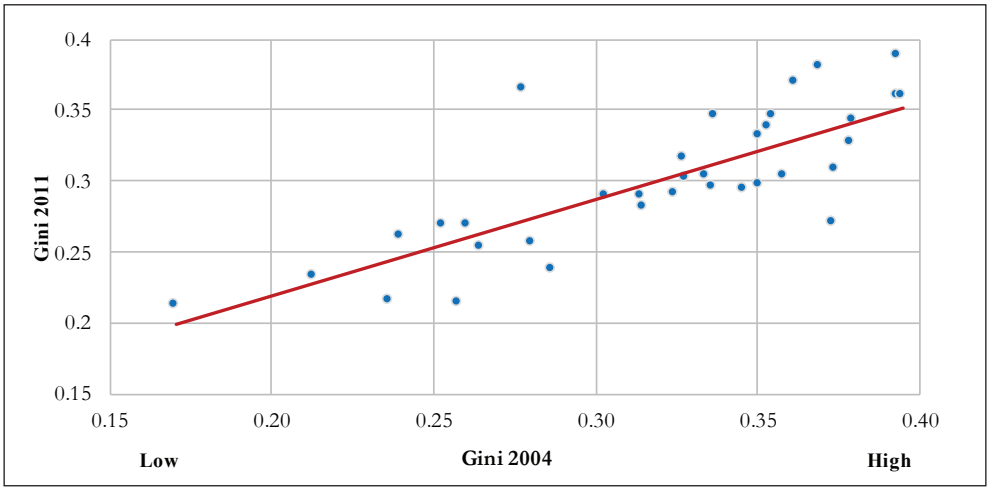
assets or the ratio of the consumption of top 5 per cent of the population to bottom 5 per cent of the population. Also, the relationships remain similar across different time periods. Figure 12 highlights the strong positive correlation between the inequality in 2004 with inequality in 2011. The states which had lower inequality in 2004 also experienced low inequality in 2011 as well and vice versa.

**Figure 11: Relationship between consumption inequality and asset inequality among Indian States**




Source: Gini based on Assets from All India Debt and Investment Survey (AIDIS) conducted by NSS 70th Round 2012-13, Ratio of top 5 per cent to bottom 5 per cent using MPCE (Monthly per capita expenditure) data from NSS Consumption Surveys

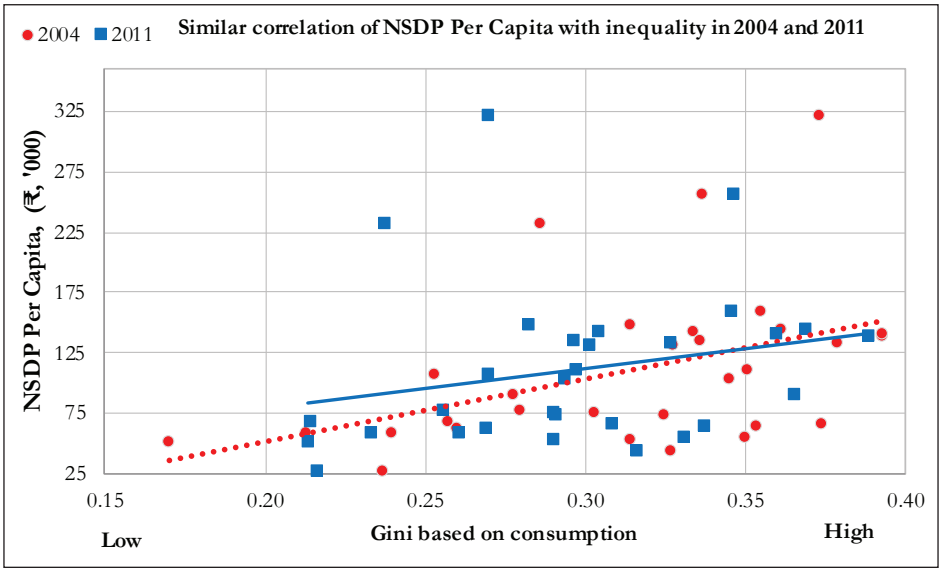
**Figure 12: Relationship between consumption based gini coefficient for the year 2004 and gini coefficient for the year 2011 in Indian states**




Source: Survey calculations based on NSS consumption expenditure data for 2004-05 and 2011-12.

4.9 Figure 13 shows the correlation between inequality measured by Gini based on consumption for the period 2004 and 2011 with the per capita net state domestic product. The figure showcases that the relationship is almost identical in 2004 and 2011.

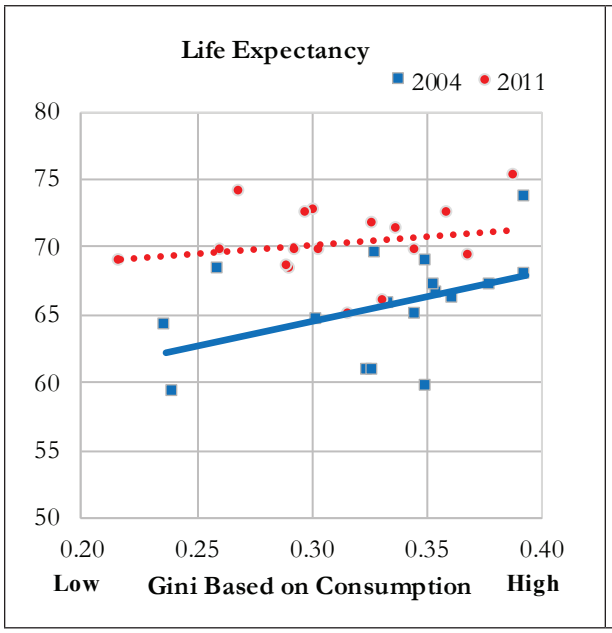
**Figure 13: Relationship between NSDP per capita and consumption based gini coefficient, 2004 and 2011 in Indian states**




Source: Survey calculations based on NSS consumption expenditure data for 2004-05 and 2011-12and NSDP from MoSPI

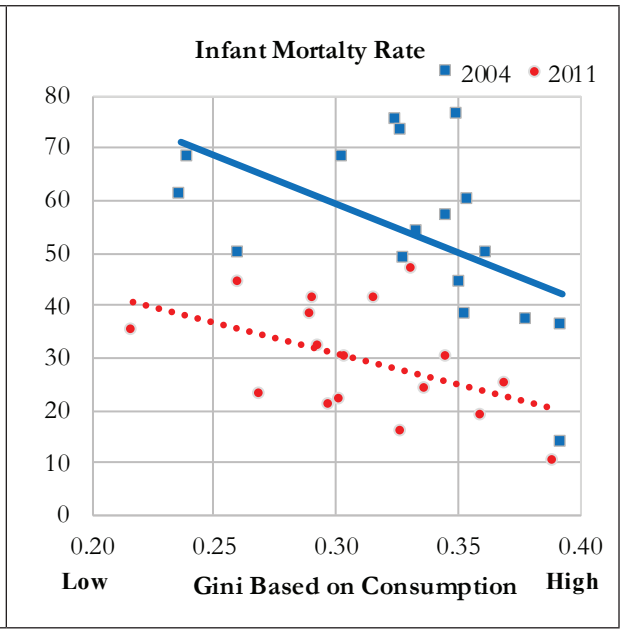
4.10 In the series of graphs below i.e., Figure: 14 (1-5), the correlations between inequality and socio economic outcomes is plotted, which broadly remain similar for 2004 and 2014.

**Figure 14 (1): Correlation of inequality and life expectance in the year 2004 and 2011 in Indian states**



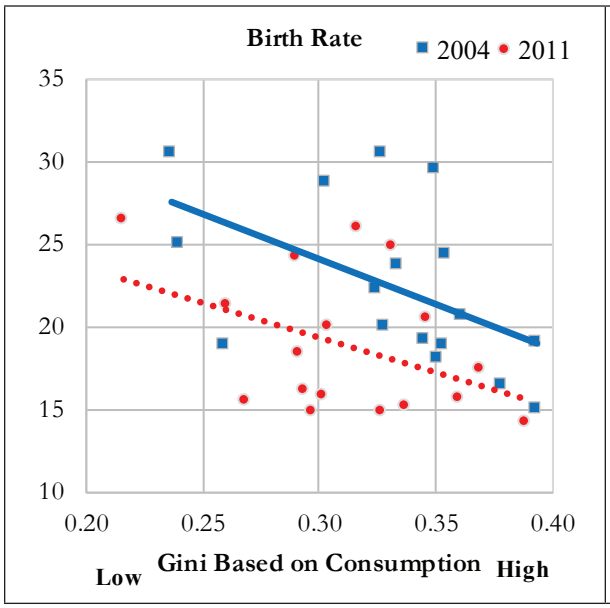

Source: Life Expectancy (2013-17) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 14 (2): Correlation of inequality and infant mortality rates in the year 2004 and 2011 in Indian states**



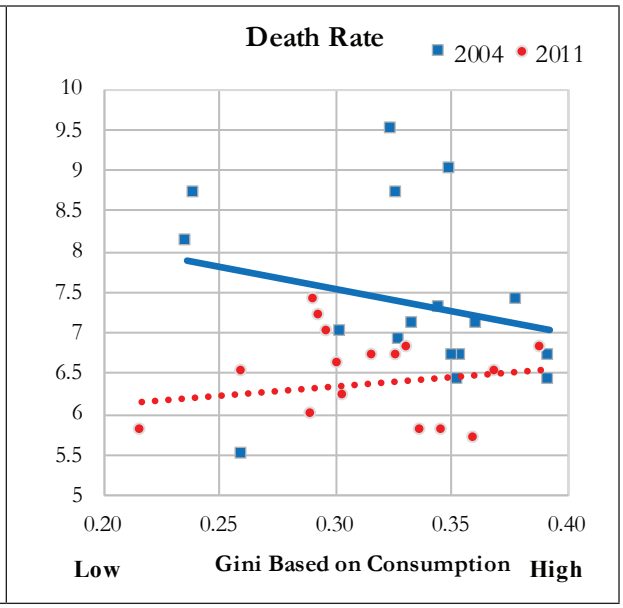

Source: Infant Mortality Rate data (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 14 (3): Correlation of inequality and birth rate in the year 2004 and 2011 in Indian states**



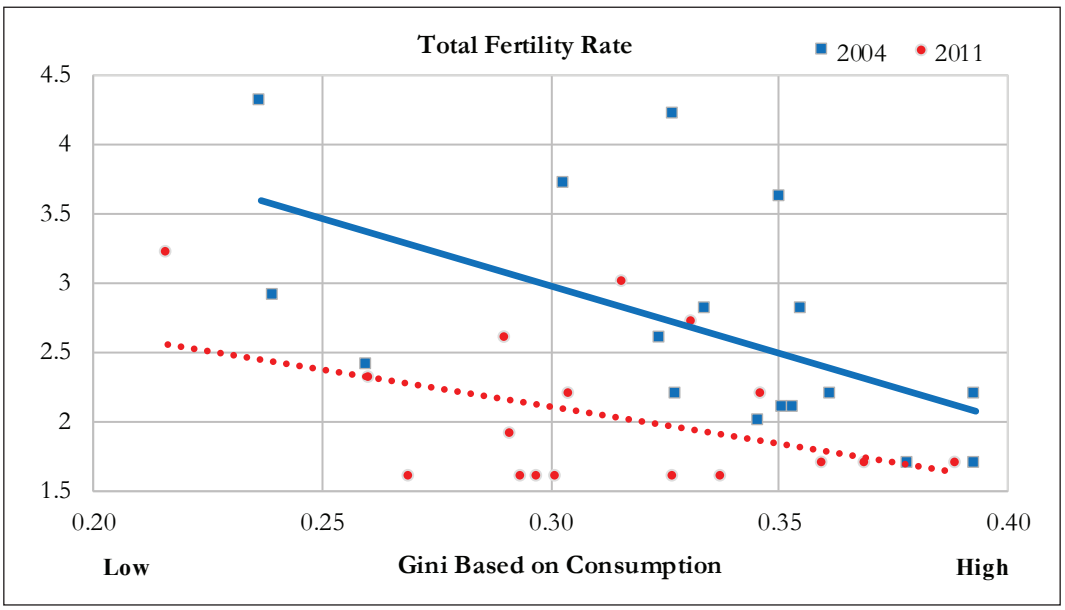

Source: Birth Rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 14 (4): Correlation of inequality and death rate in the year 2004 and 2011 in Indian states**




Source: Death Rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 14 (5): Correlation of inequality and total fertility rate in the year 2004 and 2011 in Indian states**




Source: Total Fertility Rate (2017) from Office of the Registrar General of India, Ministry of Home Affairs

4.11 The findings that inequality and income per capita converge in terms of their correlation with socio-economic outcomes, thereby implying the absence of a trade-off between economic growth and inequality, are buttressed by the Chinese experience as well (see Box 1). Thus, the conflict between inequality and economic growth that is observed in advanced economies

does not seem to manifest in countries that have high growth rates and high levels of absolute poverty.

## Box 1: POVERTY AND INEQUALITY TRADEOFF IN CHINA

China has made exceptional strides in reducing its extreme poverty rates since 1970s. As per data from China National Bureau of Statistics, the head count ratio of poverty has reduced by 94 per cent from 1980 to 2015 in rural China. By the official poverty line, which is about 21 per cent higher than the line that is set at USD 1.9 per day (2011 PPP), since 1980, the country has made remarkable progress in reducing poverty.

In contrast, the Gini coefficient of income distribution among rural residents in China rose from 0.241 in 1980 to 0.39 in 2011 or by 62 per cent according to the official estimation. In the 32 years between 1980 and 2012, per capita net income among the rural population rose by an annual average of 6.9 per cent. During the period, the income for the bottom 20 per cent and 40 per cent households increased 4.5 per cent and 6 per cent annually respectively, while the top quintile household increased their income at an annual rate of 7.5 per cent, as per World Bank[3]. The huge fall in poverty came from the poorest quintile increasing their annual income over a long time, while the rise in inequality stemmed from top quintile increasing their income much faster than their poor counterparts.

The same World Bank research also argues that benefits of China's sustained economic growth have really trickled down. Accelerating industrialization and urbanization in a country of over one billion people has transformed a large number of the agricultural surplus labor in the countryside into urban employment in China. Between 1978 and 2015, the number of people in nonfarm jobs as a percentage of total employment increased from 29 per cent to 70 per cent. This change also occurred in poor areas and to poor households. Official data indicates that, while the number of those that moved away for nonfarm jobs out as a percentage of the total size of the local labor populations was slightly lower in poverty-stricken areas than in the nation as a whole, the gap between the growth rates of the number of people shifting to nonfarm jobs in poor areas and in the nation as a whole was reduced to close to zero for the 1996-2009 period. Between 2002 and the end of 2012, earnings from wage and salaries as a percentage of total household income rose from 26 per cent to 43 per cent for rural households in the bottom 20 percentile, at a rate that was roughly comparable to the national average. Evidently, low-income rural households have benefitted proportionally from the changes in the country's employment pattern engendered by the dual process of industrialization and urbanization.

This was also aided by a good system of equal land ownership reforms, social development programs in rural areas since 2000 (including universal compulsory education up to grade 9, rural medical cooperative system, social pension system for rural residents, and a minimum living allowance scheme) and targeted poverty reduction programs, in place nationally since 1986. China is now on road to end extreme poverty by 2030.

[3]Wu, Guobao. 2016. 'Ending poverty in China: What explains great poverty reduction and a simultaneous increase in inequality in rural areas?'. World Bank blogs. (Ending poverty in China: What explains great poverty reduction and a simultaneous increase in inequality in rural areas? (worldbank.org))

## IS PERFECT EQUALITY OPTIMAL?

4.12 Having established that inequality and income per capita do not diverge in their relationship with socio-economic outcomes in India, now it is worth asking : is perfect equality optimal? In most cases, inequality of opportunity is much more objectionable than inequality of outcomes, as individuals' opportunities are influenced by endowments that are related to parents and other adults, peers, and a variety of chance occurrences throughout their lifetimes.

4.13 Note that perfect equalisation of outcomes ex-post, i.e., after the efforts have been exerted to obtain those outcomes, can reduce individuals' incentives for work, innovation and wealth creation. A benevolent social planner seeks to maximize aggregate welfare: an economy in which each individual possesses 2 units of wealth is preferable to one in which each individual possesses only 1 unit of wealth. This is true even if the planner assigns greater weight to the poor than the rich, i.e., the planner's social welfare function depends on not just the size of the pie but also how it is distributed.

4.14 In sum, for a developing country such as India, where the growth potential is high and the scope for poverty reduction is also significant, a policy that lifts the poor out of poverty by expanding the overall pie is preferable as redistribution is only feasible if the size of the economic pie grows rapidly.

### Box 2: How do people view inequality: Fairness, self-interest and morality

Do people aspire for a perfectly equal society? Experimental evidence suggests that this idea is surprisingly uncertain. Norton and Ariely (2011) conducted a study in the U.S. where participants were shown three pie charts picturing the wealth distribution of hypothetical countries: a perfectly equal one, one with moderate levels of inequality (inspired by Sweden) and an unequal one (representing the U.S.). Most participants chose the second option as the nation they preferred to live in, thus expressing their desire for *some* inequality. Moreover, when describing their ideal world, they reportedly wished for the richest quintile of the U.S. to own about 32 per cent of total wealth, more than three times the wealth they wished for the poorest quintile. It appears that even when imagining an ideal world, people aim for social stratification. This phenomenon manifests when the subjects are asked not only about distribution of income, but also wealth and CEO-worker pay gaps. Kiatpongsan and Norton (2014) show that Americans wish for a ratio of 7:1 in CEO-worker pay gaps so that a CEO should ideally earn $7 for every $1 earned by a factory worker[4]. Ironically, what leads people to choose a moderate level of inequality is their sense of fairness reflected in the idea that people with certain inherent characteristics and abilities deserve more than others.

However, inequality in reality is far worse that what people desire. Yet, why does it persist in a democratic polity? If people were made more aware about the reality of where they stand in the income ladder, would that generate a societal preference for redistribution to reduce inequality? Hauser et al. (2016) study this question in the U.S. in groups of five participants who played a public goods game. Players in the game were assigned an 'income' reflecting each quintile in the U.S. Then, participants contributed to a common pool and were given the possibility to punish and reward fellow

[4]Kiatpongsan S, Norton M. 2014. How much (more) should CEOs make? A universal desire for more equal pay. Perspectives on Psychological Science; 9(6): p. 587-593

players, if they believed that someone contributed more or less than they should. Results showed that when participants were aware of the income of the other players, they rewarded poorer participants and punished richer ones. This leads us to believe that information – at least in contexts and societies similar to the U.S. – could be the key to the issue of redistribution and inequality. However, this strategy, however, seems to be successful only when it is self-serving: when people learn that they are overestimating their own position in the distribution, i.e. they are poorer than what they believed, they lend more support to redistribution. Those who underestimate their position, i.e. they are richer than what they believed, instead, support redistribution less, especially when they believe that their position in the distribution stems from their personal effort. This evidence is consistent with other research investigating self-interest theories: people will tolerate, support or reject inequality depending on what favours their own position (Curtis and Andersen, 2015; Katadija et al. 2017).

## INEQUALITY OR POVERTY?

4.15 Inequality needs to be distinguished from poverty. Inequality refers to the degree of dispersion in the distribution of assets, income or consumption. Poverty refers to the assets, income or consumption of those at the bottom of the distribution. Poverty could be conceptualised in relative terms or in absolute terms. People feel themselves to be poor, and think others to be poor if they have substantially less than what is commonplace among others in their society. Poverty, in this view, is relative deprivation. (Brady 2003; Iceland 2003). If the poverty is conceptualized in relative terms, there is no need to distinguish it from inequality. A relative measure of poverty is indeed a measure of inequality.

4.16 On the other hand, if poverty is conceptualized in an absolute sense, that is, focusing on the absolute levels of assets, income or consumption of those at the low end of the distribution, then increases in inequality may be accompanied by reduction in poverty. Feldstein (1999) disagrees with the common reaction of the popular press and academic discussions that regards inequality and not poverty as the problem. He postulates that policy should aim at addressing poverty rather than inequality. He explains with an example of a magic bird providing $1000 to each of the Public Interest (the journal in which Feldstein's article was published) subscriber, everyone would see it as a good thing. However, since each subscriber has greater average-income, it will result into greater inequality in the nation. Feldstein finds it inaccurate to contemplate the $1000 bonanza as morally suspect.

4.17 The Feldstein-type challenge is consistent with a variety of other views about distributive justice. Perhaps the best known is that of John Rawls (1971). Rawls argued that the most reasonable way to decide upon a fair distributive principle is to imagine that you must make this decision knowing you will be born into the world but not knowing anything about what your assets and characteristics – intelligence, personality traits, parents, neighbourhood, gender, skin colour, etc. – will be. Rawls referred to this hypothetical scenario as the "original position." He suggested that in such a situation a rational person would choose a distributive principle requiring that any increase in inequality increase the income of those at the bottom. In Feldstein's example, according to the Rawlsian criterion the $1,000 windfall given to the well-to-do would only be justifiable if it was accompanied by some increase for those at the low end. Rawls's distributive principle is a "maximin" one: whatever distribution maximizes the income of the poorest (and provides basic liberties) is to be preferred.

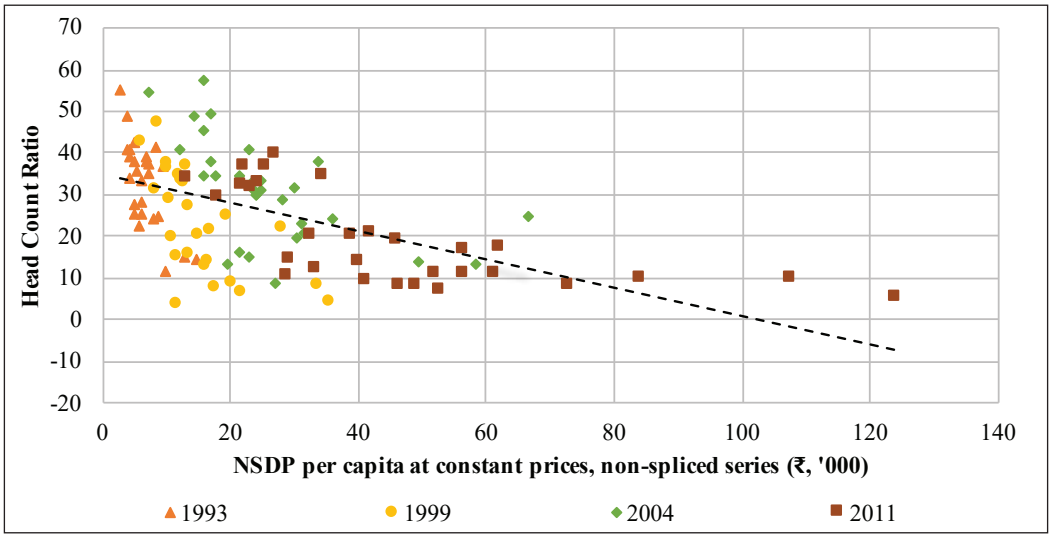
4.18 Experimental evidence suggests that the maximin principle is not how people in the "original position" would choose. In experiments in which five or so participants are placed in a situation approximating Rawls' "original position," most participants do not choose based on this distributive principle. Instead, they choose a principle in which the average income is maximized with a floor under the incomes of those at the bottom (Frohlich, Oppenheimer, and Eavey, 1987). In this view, as long as the poor have "adequate" incomes, an increase in the incomes of the rich need not benefit the poor to be considered just. The results of such experiments suggest that (absolute) poverty should be of greater concern than inequality.

4.19 Of course, it is possible that if the incomes of the rich pull too far away from the rest of society, growing frustration may lead to rising crime, withdrawal from civic engagement, and loss of social cohesion (Krugman 2002). In this context, the evidence provided in Section 2 above against the conflict between inequality and income per capita among the Indian states suggests that at the level of development that India is currently in, the focus on poverty alleviation through growth must be central to India's economic strategy.

## RELATIVE IMPACT OF ECONOMIC GROWTH AND INEQUALITY ON POVERTY IN INDIA

4.20 Given the above discussion, which highlights that poverty alleviation through growth must remain the economic focus for India, this section examines whether income per capita or inequality impacts poverty the most in India. The correlations between income and poverty and inequality and poverty in the Indian states is estimated. To analyse the relationship between income and poverty, per capita NSDP (actual series and spliced series) and the official head count ratio are plotted (Figure 15-16). The data for four years (1993, 1999, 2004 and 2011) suggests an overall strong negative relationship, implying that the states with greater income or high per capita NSDP experienced low rates of poverty and vice versa. However, such strong

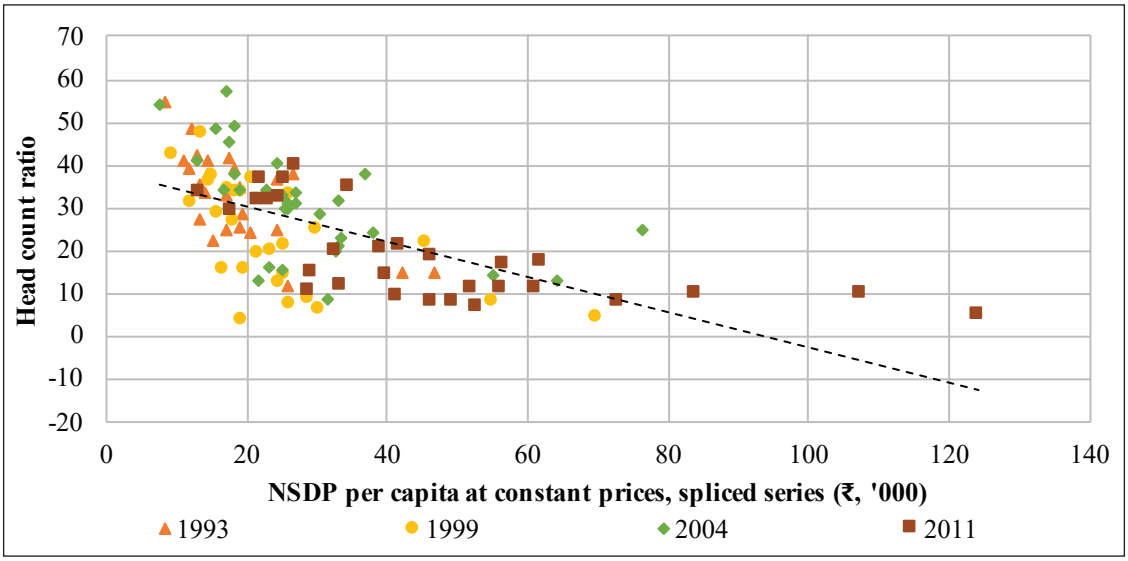
**Figure 15: Relationship between income (NSDP per capita at constant prices, non-spliced series (INR)) and poverty (Head count ratio) in Indian states**




Source: Survey calculations based on MoSPI data on NSDP and official poverty estimates of erstwhile Planning Commission.

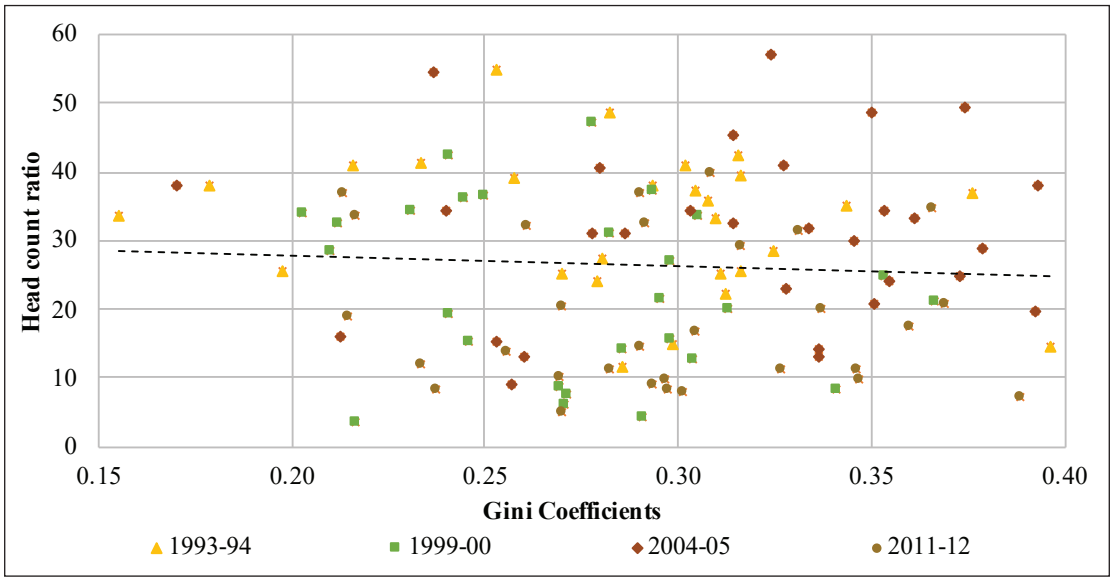
relationship is absent between inequality and poverty. As illustrated in Figure 17, there does not exist any correlation between inequality and poverty among the Indian states leading to an ambiguous conclusion.

**Figure 16: Relationship between income (NSDP per capita at constant prices, spliced series (INR)) and poverty (Head count ratio) in Indian states**




Source: Survey calculations based on MoSPI data on NSDP and official poverty estimates of erstwhile Planning Commission.

**Figure 17: Relationship between inequality (Gini based on consumption) and poverty (Head count ratio) in Indian states**




Source: Survey calculations based on NSS consumption round data for various thick rounds and official poverty estimates of erstwhile Planning Commission.

4.21 Using a panel of 21 states for 4 years, 1993-94, 2004-05, 2009-10 and 2011-12, the relationship between economic growth and poverty is analysed (Table 1)[5]. The variables used in the regression are as defined in Box 3.

**Table 1: Impact of Economic Growth on Poverty**

| Dependent variable is log of Head Count Ratio: | Rural+Urban | | Rural | | Urban | |
|---|---|---|---|---|---|---|
| Ln (Real NSDP per capita) | -0.453*** | -0.711* | -0.448*** | -0.650* | -0.445*** | -0.623* |
| | (-4.76) | (-2.47) | (-3.78) | (-2.16) | (-4.86) | (-2.28) |
| Ln(Real Government Welfare | | -0.149** | | -0.144** | | -0.176*** |
| expenditure per BPL family) | | (-3.54) | | (-3.29) | | (-4.42) |
| Inflation rate (in percent) | | -0.0014 | | -0.00145 | | -0.00157 |
| | | (-0.52) | | (-0.51) | | (-0.61) |
| Rich to poor ratio of MPCE | | 0.595* | | 0.618* | | 0.406 |
| | | (2.23) | | (2.22) | | (1.6) |
| Literacy rate percent (in 1991) | | -0.00232 | | -0.00604 | | 0.00491 |
| | | (-0.17) | | (-0.43) | | (0.38) |
| Life expectancy at | | 0.0281 | | 0.0482 | | -0.0178 |
| birth-years (in 1991) | | (0.69) | | (1.13) | | (-0.46) |
| Gini for land | | -3.385 | | -4.972 | | 0.595 |
| distribution (in 1991) | | (-1.01) | | (-1.42) | | (0.19) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.27 | 0.38 | 0.19 | 0.31 | 0.28 | 0.44 |
| N | 84 | 63 | 84 | 63 | 84 | 63 |

t-statistics in parentheses; * p<0.05, **p<0.01, *** p<0.001

**Box 3: Sources and definitions of variables used in panel regressions in Table 1**

- The fraction of population below the poverty line, measured in terms of headcount ratio (POVR), estimated by Tendulkar Committee for 2011-12 (erstwhile Planning Commission) is used as the dependent variable.
- For income, real per capita Net State Domestic Product (PCY) at 2011-12 prices is sourced from Ministry of Statistics and Programme Implementation.
- Consumer Price Index for Agriculture Labour (base = 1986-87) sourced from Labour Bureau is taken as measure of inflation rate (INF).
- Cumulative average of social sector expenditure (EXP) by states per below poverty line person for the years 1993-94, 2004-05, 2009-10 and 2011-12 is sourced from Reserve Bank of India reports on Handbook of Statistics on State Government Finances and State Finances: A Study of State Budgets. Cumulative average captures the accumulated effect of public sector expenditure on poverty better compared to the expenditure in a particular year.

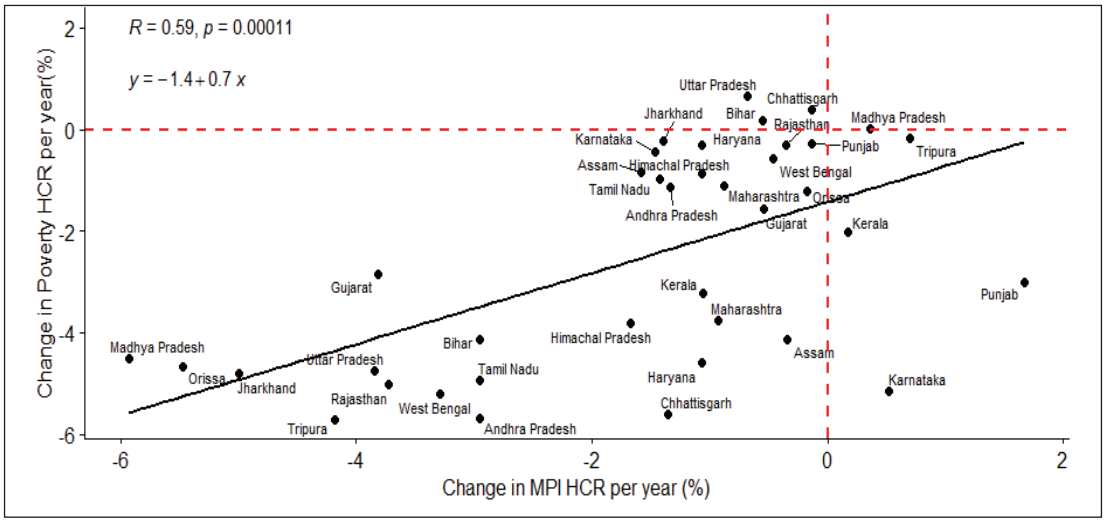
[5]Based on availability of data, 21 major states were covered, excluding Union Territories, North Eastern States except Tripura, Goa and Jammu & Kashmir. Because of the issues of comparability, as the design of the 55th round 1999-2000 questionnaire was different from that in earlier rounds, estimates of poverty for 1999-2000 are not used in the analysis.

- Rich to poor ratio (INQ) is taken as a measure of inequality from the study by Chauhan et. al. (2015) defined as ratio of richest to the poorest consumption quintile for 1993-94, 2004-05, and 2011-12.
- To control for initial level of development, Gini coefficient for land distribution (LAND) sourced from National Sample Survey Office report on Operational Land Holdings in India 1991-92, literacy rate (LIT) from Census 1991, and life expectancy (LIFE), 1991 are taken from Sample Registration System, Bulletin.

4.22 To shed light on post 2011-12 evidence on the impact of economic growth on poverty, the information on multidimensional poverty headcount ratio from Global Multi-dimensional Poverty Report 2018 for 2005-06 and 2015-16, and from Alkire and Seth (2013) for the year 1998-99 is used. MPI is based on three dimensions – education, health and standard of living – using ten indicators viz; education attainment, year of education; nutrition and mortality; and electricity, drinking water, sanitation, cooking gas, housing, and assets. Headcount ratio counts persons as multi-dimensionally poor if their composite score is more than 0.33. HCR of MPI is interpreted as proportion of population that is multi-dimensionally poor.

4.23 First, note that states that witnessed large reduction in poverty, using the official estimates based on consumption, experience proportional reductions in multi-dimensional poverty as well. Figure 18 plots state's values of change in MP-HCR per year against change in this measure of poverty HCR per year.[6] The regression line shows that the association between MPI and poverty has been positive. It indicates that improvement in poverty also alleviates poverty measured along multiple dimensions and vice versa.

**Figure 18: Correlation between poverty based on consumption and multi-dimensional poverty**

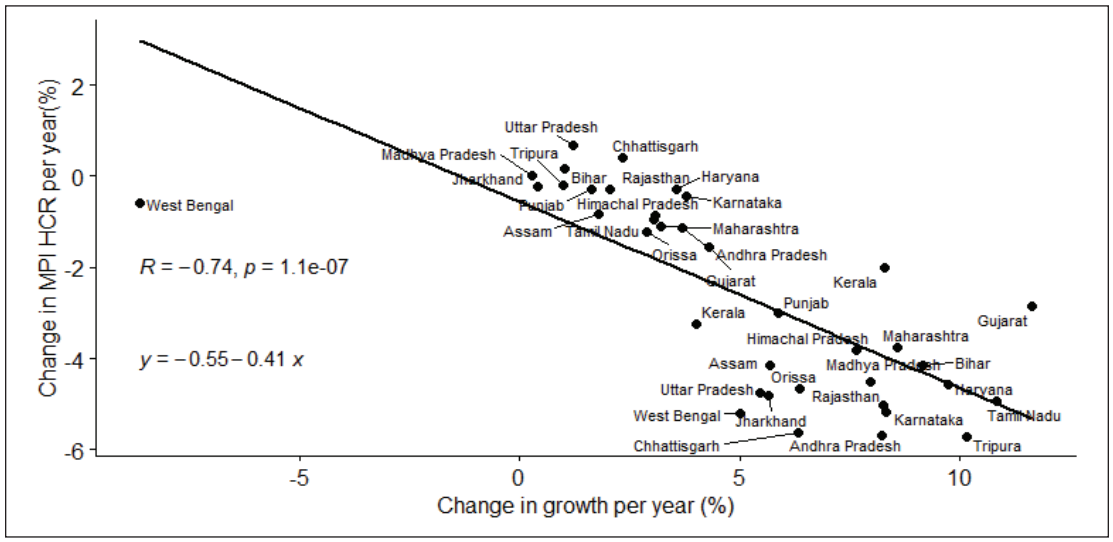



Source: Survey calculations based on official poverty estimates of erstwhile Planning Commission and MPI.

[6]The change in poverty HCR is calculated between '1993-94 and 2004-05', and for the period between 2004-05 and 2011-12. The corresponding figures for MPI are for '1999 and 2005-06' and '2005-06 and 2015-16' for which estimates are available.

4.24 Finally, Figure 19 plots value of change in MP HCR per year against growth of real NSDP per year between 1998-99 and 2005-06, and between 2005-06 and 2015-16. The association between growth and change in MP is negative, reinforcing the idea that growth leads to poverty reduction.

**Figure 19: Correlation between economic growth and multi-dimensional poverty**




Source: Survey calculations based MoSPI and MPI data.

4.25 These findings are consistent with the historical evidence as well. World Bank (2000) find that India could achieve sustained decline in poverty during 1970s-1990s only when the GDP growth picked up from 3.5 per cent in the initial years. Also, rise in the growth of mean consumption was responsible for approximately 87 per cent of the cumulative decline in poverty, while redistribution contributed to only 13 per cent. Similarly, Kraay (2004) uses the evidence from 80 countries to demonstrate that in medium to long run, growth in average incomes contributed to 66-90 per cent of the variations in changes in poverty. Agrawal (2015) highlights that economic growth had a bigger impact on reducing poverty. The findings reinforce previous studies on the empirical relation between growth and poverty in India (see Nayyar (2005)). More recently, analysing six decades of data from 1957 to 2012 for India, Dutt *et. al.*, (2019) find that growth reduced poverty, and their association has acquired more strength after the 1991 reforms. They also find that the pattern of growth has changed significantly after 1991. Poverty is concentrating more and more in urban areas, as now one-in-three poor is living in urban areas, which was about one-in-eight in the early 1950s. In the post-liberalisation period urban growth and non-agricultural growth has emerged as a major driver of national poverty reduction including rural poverty.

## SUMMARY AND CONCLUSIONS

4.26 This chapter shows that the relationship between inequality and socio-economic outcomes, on the one hand, and economic growth and socio-economic outcomes, on the other hand, is different in India from that observed in advanced economies. By examining the correlation of inequality and per-capita income with a range of socio-economic indicators, including health, education, life expectancy, infant mortality, birth and death rates, fertility rates, crime, drug usage

and mental health, the Survey highlights that both income per capita (as a proxy for economic growth) and inequality have similar relationships with socio-economic indicators. Thus, unlike in advanced economies, in India economic growth and inequality converge in terms of their effects on socio-economic indicators. Furthermore, this chapter finds that economic growth has a far greater impact on poverty alleviation than inequality. Therefore, given India's stage of development, India must continue to focus on economic growth to lift the poor out of poverty by expanding the overall pie. Note that this policy focus does not imply that redistributive objectives are unimportant, but that redistribution is only feasible in a developing economy if the size of the economic pie grows.

**CHAPTER AT A GLANCE**

- The relationship between inequality and socio-economic outcomes, on the one hand, and economic growth and socio-economic outcomes, on the other hand, is different in India from that observed in advanced economies.
- By examining the correlation of inequality and per-capita income with a range of socio-economic indicators, including health, education, life expectancy, infant mortality, birth and death rates, fertility rates, crime, drug usage and mental health, the Survey highlights that both economic growth – as reflected in the income per capita at the state level –and inequality have similar relationships with socio-economic indicators.
- Unlike in advanced economies, economic growth and inequality converge in terms of their effects on socio-economic indicators in India.
- Economic growth has a far greater impact on poverty alleviation than inequality.
- Given India's stage of development, India must continue to focus on economic growth to lift the poor out of poverty by expanding the overall pie.
- Redistribution is only feasible in a developing economy if the size of the economic pie grows.

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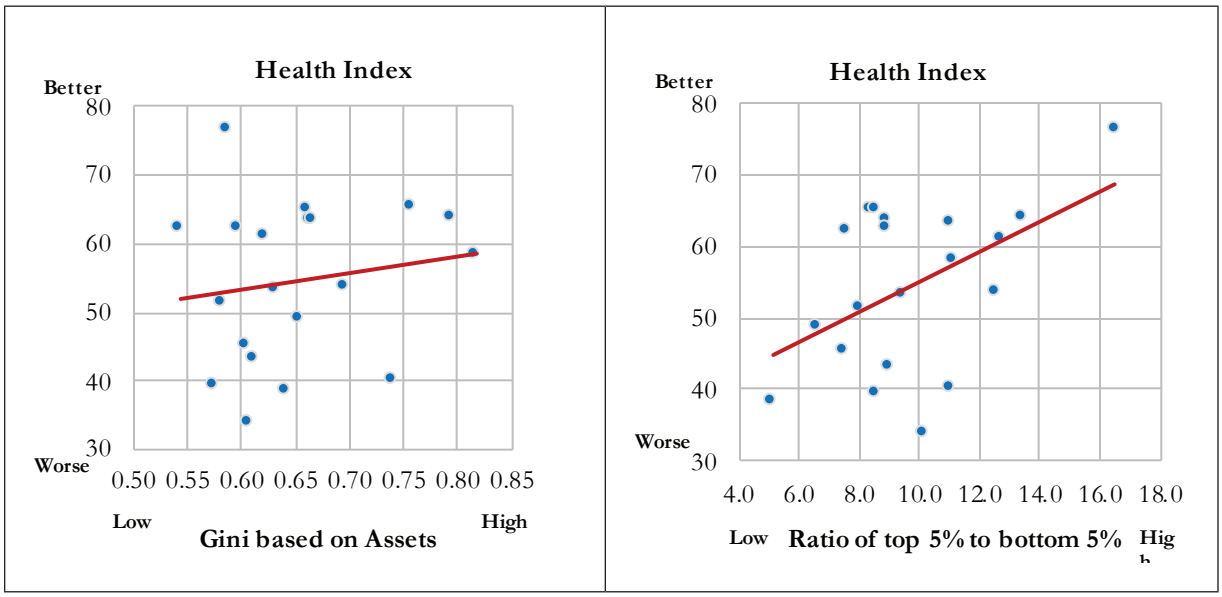
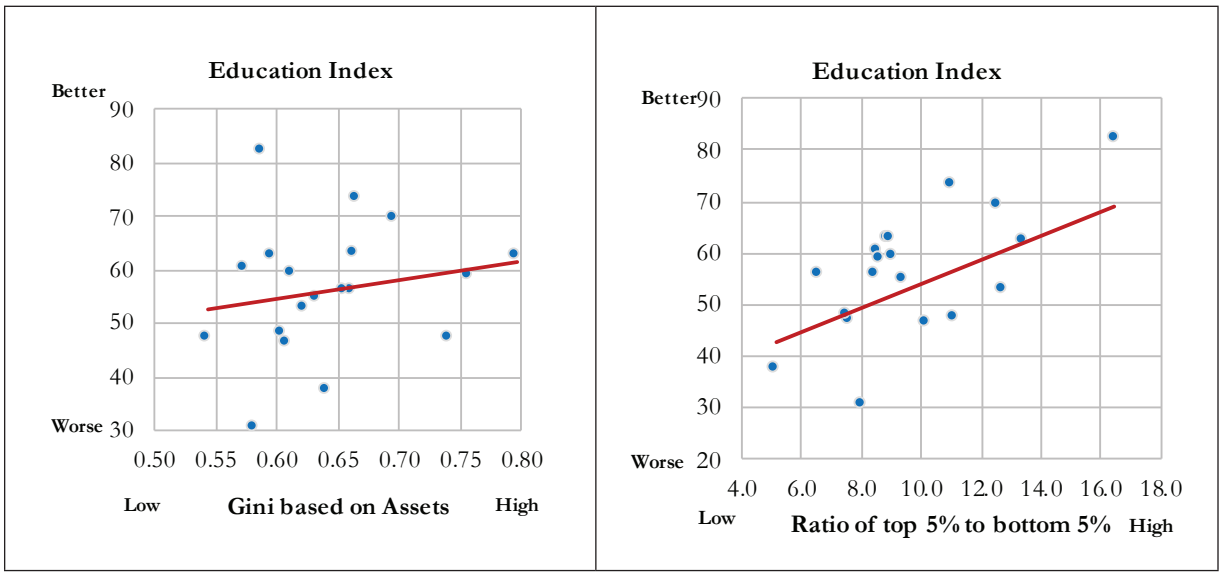
## Appendix A: Robustness of the correlation of socio-economic indicators to alternative definitions of inequality

**Figure 20: Correlation of asset and consumption inequality with health outcomes in Indian states**



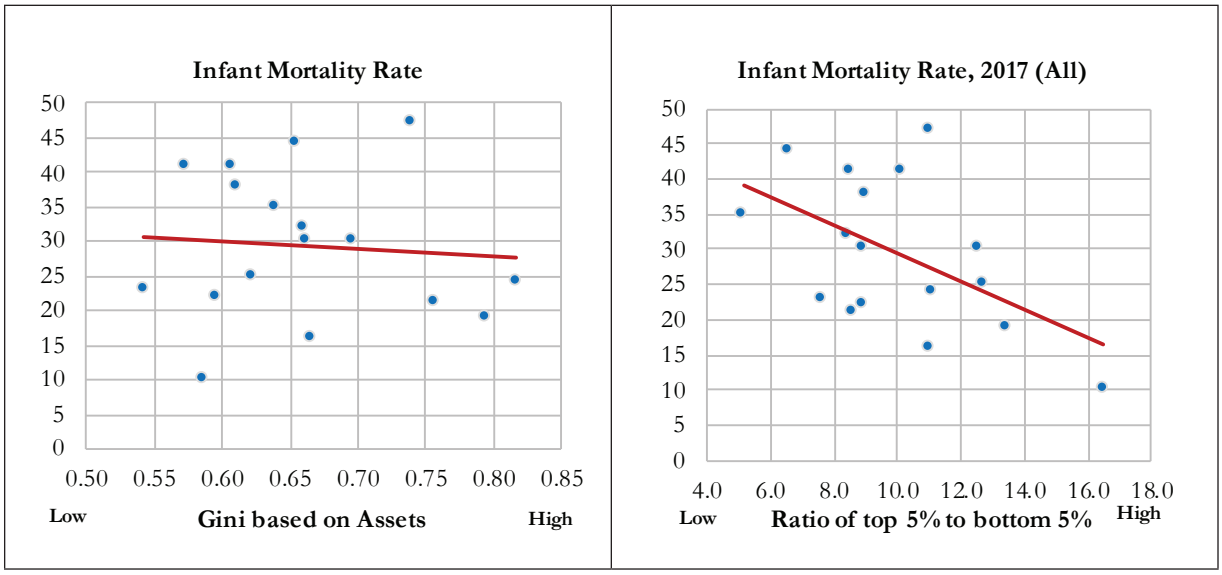

Source: Health index (2017-18) from NITI Aayog, Gini based on Assets from All India Debt and Investment Survey (AIDIS) conducted by NSS 70th Round 2012-13, Ratio of top 5 per cent to bottom 5 per cent using Monthly per capita expenditure data from NSS Consumption Surveys

**Figure 21: Correlation of asset and consumption inequality with education outcomes in Indian states**



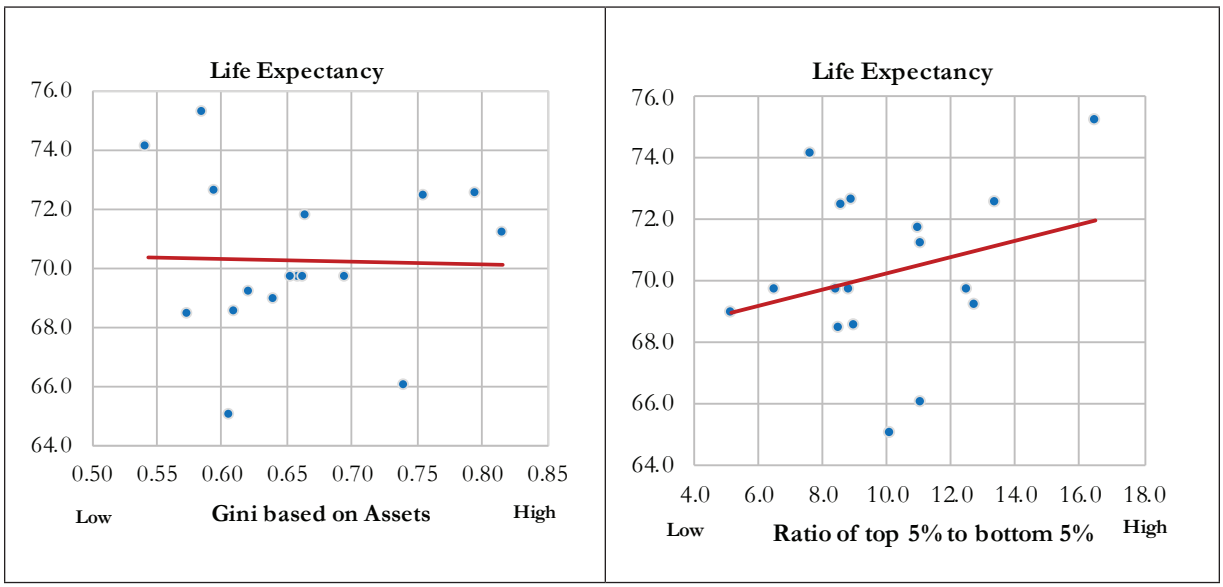

Source: Education index (2016-17) from NITI Aayog

**Figure 22: Correlation of asset and consumption inequality with infant mortality in Indian states**



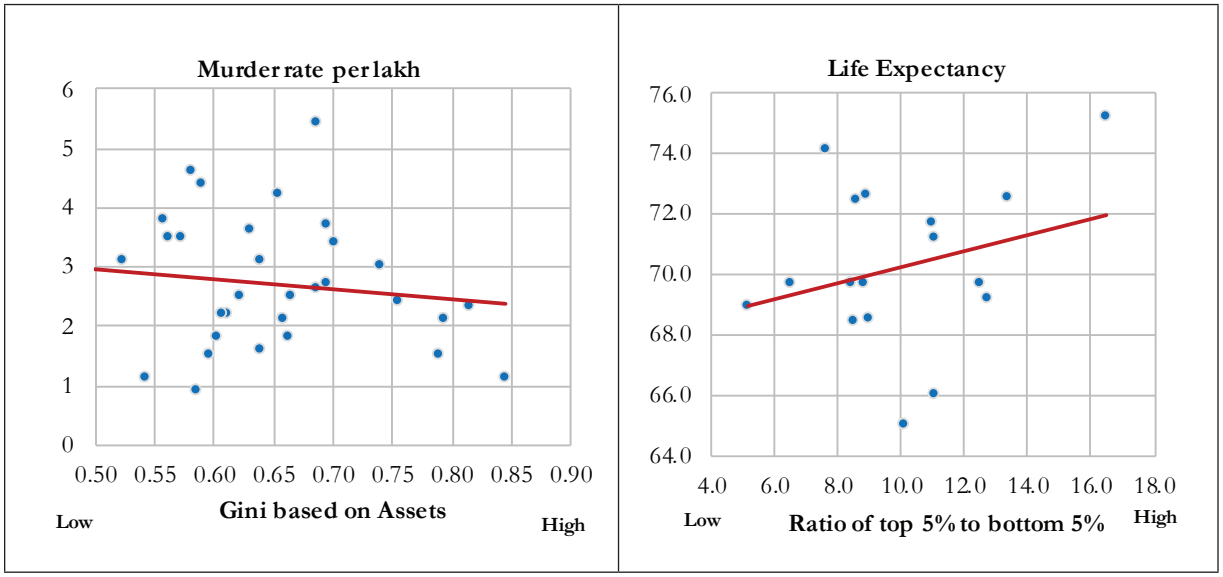

Source: Infant Mortality Rate data (2017) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 23: Correlation of asset and consumption inequality with life expectancy in Indian states**



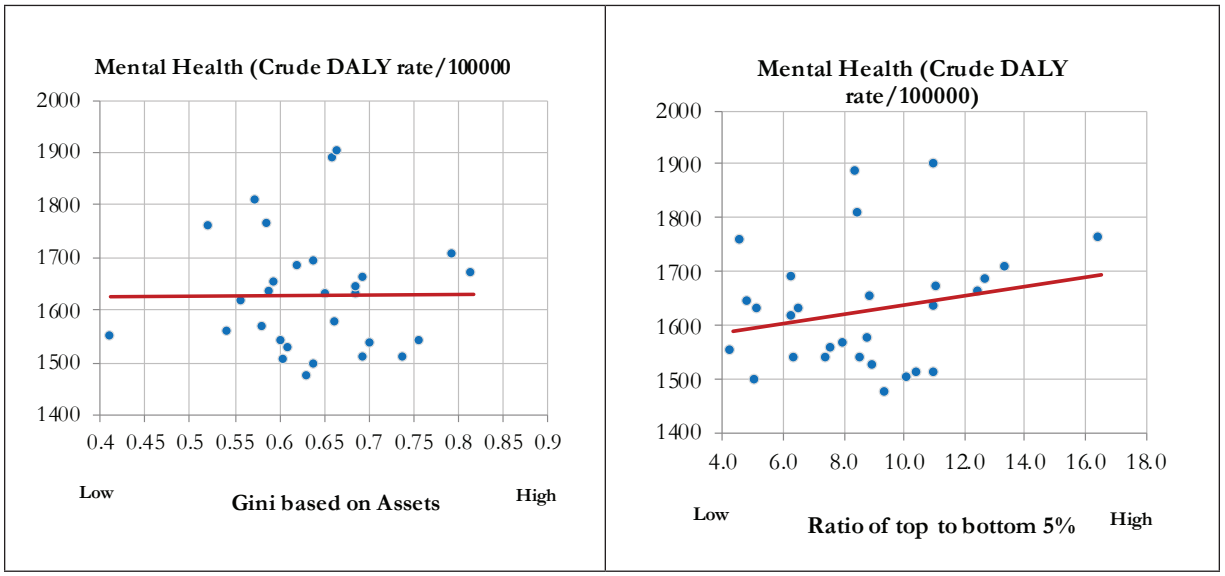

Source: Life Expectancy data (2013-17) from Office of the Registrar General of India, Ministry of Home Affairs

**Figure 24: Correlation of asset and consumption inequality with crime rates in Indian states**




Source: Crime data (2015) from National Crime Records Bureau, Ministry of Home Affairs

**Figure 25: Correlation of asset and consumption inequality with mental health outcomes in Indian states**




Source: Mental Health data (2017), Lancet Psychiatry (2020). The burden of mental disorders across the states of India: the Global Burden of Disease Study 1990–2017. Note: the mental health indicator is a composite indicator including Crude DALY i.e. (The disability-adjusted life year)- a measure of overall disease burden, expressed as the number of years lost due to ill-health- from various mental issues like depressive disorders, anxiety disorders

# Healthcare takes centre stage, finally!

05
CHAPTER

**"It is health that is real wealth and not pieces of gold and silver."**

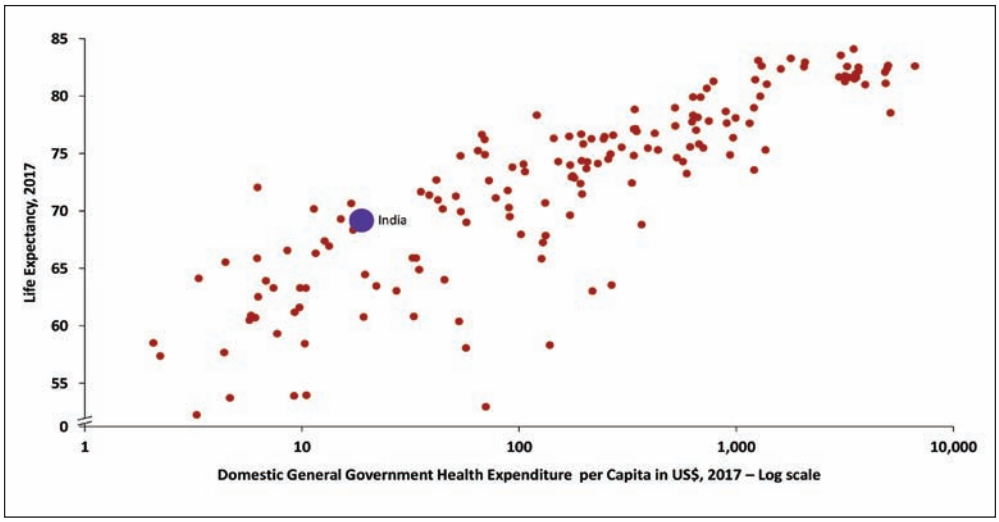
**—Mohandas K. Gandhi**

*The recent COVID-19 pandemic has emphasised the importance of the healthcare sector and its inter-linkages with other key sector of the economy. The ongoing pandemic has showcased how a healthcare crisis can get transformed into an economic and social crisis. First, while key learnings need be gleaned from the current health crisis, healthcare policy must not become beholden to "saliency bias", where policy over-weights a recent phenomenon that may represent a six-sigma event that may not repeat in an identical fashion in the future. To enable India to effectively respond to future pandemics, the health infrastructure must be agile. Second, given its potential to provide healthcare access in remote areas, telemedicine needs to be harnessed to the fullest by especially investing in internet connectivity and health infrastructure. Third, the National Health mission (NHM) has played a critical role in mitigating inequity as the access of the poorest to pre-natal and post-natal care as well as institutional deliveries has increased significantly. Therefore, in conjunction with Ayushman Bharat, the emphasis on NHM should continue. Fourth, an increase in public spend from 1 per cent to 2.5-3 per cent of GDP – as envisaged in the National Health Policy 2017 – can decrease the Out-Of-Pocket Expenditures from 65 per cent to 30 per cent of overall healthcare spend. Fifth, as a bulk of the healthcare in India is provided by the private sector, it is critical for policymakers to design policies that mitigate information asymmetry in healthcare, which creates market failures and thereby renders unregulated private healthcare sub-optimal. Therefore, information utilities that help mitigate the information asymmetry can be very useful in enhancing overall welfare. The Quality and Outcomes Framework (QOF) introduced by the National Health Service (NHS) in the United Kingdom 2004 as well as other quality assessment practices in various countries provide good examples in this context. A sectoral regulator to undertake regulation and supervision of the healthcare sector must be considered given the market failures stemming from information asymmetry; WHO also highlights the growing importance of the same. The mitigation of information asymmetry would also help lower insurance premiums, enable the offering of better products and help increase the insurance penetration in the country.*

## INTRODUCTION

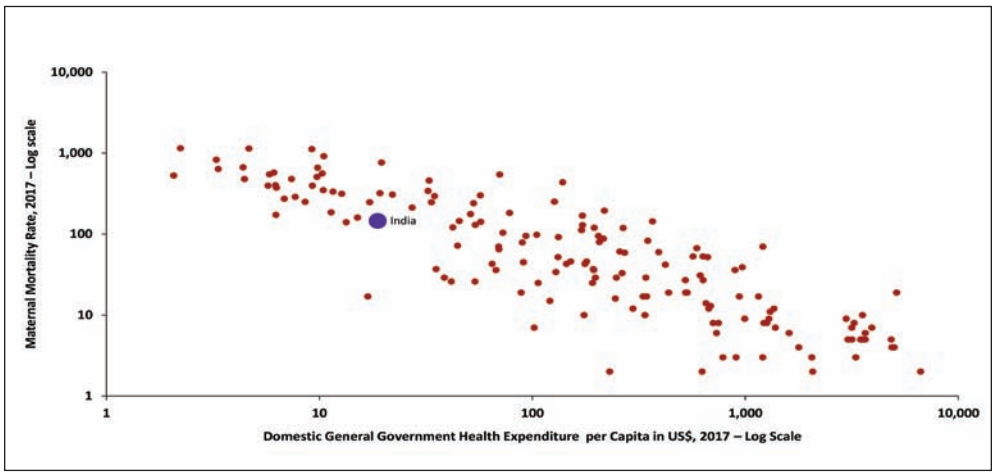
5.1 The health of a nation depends critically on its citizens having access to an equitable, affordable and accountable healthcare system. Health affects domestic economic growth directly through labour productivity and the economic burden of illnesses (WHO 2004). Increasing life expectancy from 50 to 70 years (a 40 per cent increase) could raise the economic growth rate by 1.4 percentage points per year (WHO 2004). As Figure 1 shows, life expectancy in a country correlates positively with per-capita public health expenditure. Figure 2 shows that maternal mortality correlates negatively with increases in per-capita public health expenditure.

**Figure 1: Life expectancy correlates positively with per-capita governmentspending on health (centre and state combined)**




Source: World Bank and WHO (Global Health Expenditure Data Base)

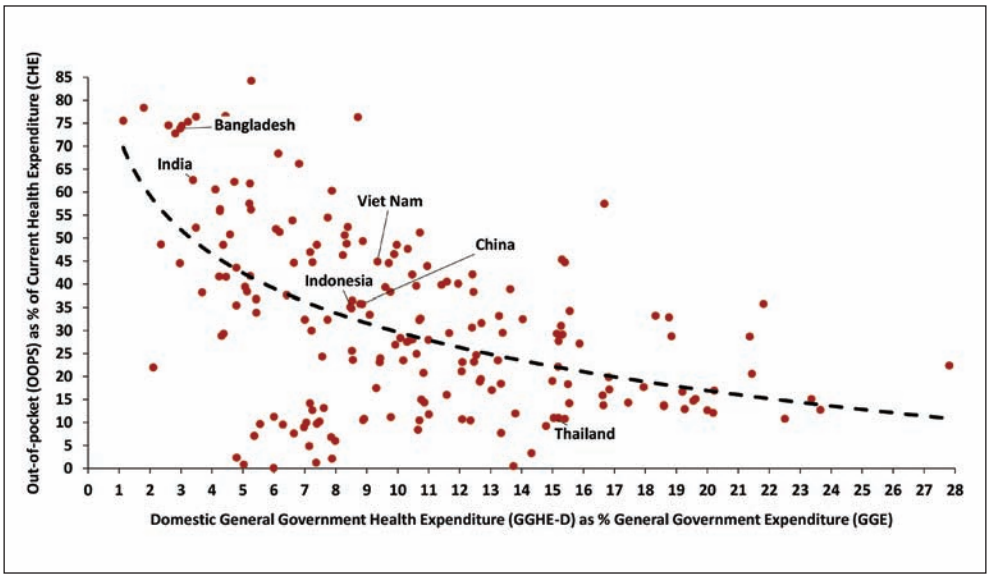
**Figure 2: Maternal mortality correlates negatively with per-capita government spending on health (centre and state combined)**




Source: World Bank and WHO (Global Health Expenditure Data Base)

5.2 Increased prioritization of healthcare in the central and state budgets is important as it crucially impacts how much protection citizens get against financial hardships due to out-of-pocket payments made for healthcare (WHO 2010). OOP for health increase the risk of vulnerable groups slipping into poverty because of catastrophic health expenditures (O'Donnell et al. 2007; Berki 1986; van Doorslaer et al. 2006). Figure 3 shows that at low levels of public health expenditure, i.e. were public healthcare expenditure as a per cent of GDP is less than 3 per cent, OOP expenditure as a share of total health expenditure drops precipitously when public health expenditure increases. For instance, an increase in public health expenditure from the current levels in India to 3 per cent of GDP can reduce the OOP expenditure from 60 per cent currently to about 30 per cent.

**Figure 3: Small increase in public health expenditure can drastically reduce OOP expenditure**




Source: WHO (Global Health Expenditure Data Base)

5.3 In fact, an increase in government healthcare spending over a decade in varied countries such as China, Indonesia, Philippines, Pakistan and Thailand significantly decreased the out-of-pocket expenditures of its citizens (Smith et al, 2020).

## GIVEN SIGNIFICANT MARKET FAILURES, HEALTHCARE NEEDS CAREFUL SYSTEM DESIGN

5.4 Healthcare systems do not self-organise using the force of free markets because of three key inherent and unchanging characteristics (Arrow, 1963): (i) uncertainty/variability of demand; (ii) information asymmetry; and (iii) hyperbolic tendencies. Hence, any active system design of healthcare must be mindful of these inherent characteristics.

### Uncertainty/variability of demand

5.5 The need for health care is driven often by factors that cannot be controlled or predicted. This is also coupled with the nature of demand, which is inelastic especially for emergency care.

Given this uncertainty and variability at the individual level, pooling of healthcare expenditures via health insurance can help to reduce healthcare risk at the macroeconomic level.

## Information asymmetry

5.6 In healthcare markets, Arrow (1963) explained that buyers of information (patients) rarely know the value of the information until after it is purchased and sometimes never at all. For example, when individuals avail of a healthcare service like dermatology (i.e., skin care), they may be able to readily evaluate the outcome. Therefore, for such services, low-quality providers will have to reduce their price to remain competitive. In contrast, patients who must undergo open-heart surgery may find it very difficult to evaluate its quality and have to therefore rely on the reputation of the hospital/doctor as a proxy for the quality. For some services such as preventive care and/or mental health, patients may never know for sure whether their provider did a good job.

5.7 This principal-agent relationship between the patient (as the principal) and the healthcare provider (as the agent) gets further complicated by factors that may influence this conflict of interest. For instance, altruism among doctors – a trait that is highly commended and looked for by patients – primarily serves to eliminate this conflict of interest. However, reimbursement rates pre-negotiated with insurance companies, advertising, the private incentives for testing, etc. can exacerbate this conflict of interest. For instance, C-sections in pregnancies, which are more profitable for the hospital/physician, are overused (Guilmoto et al, 2019). Such non-price features of healthcare can lead to obfuscation of price and/or significant price dispersions for the same good/service.

5.8 Health insurance, which becomes desirable because of the uncertainty/variability in demand, creates a second round of informational problems in healthcare markets. First, because health insurance covers (some of) the financial costs that would be caused by poor health behaviour, individuals may have less incentive to avoid them; this phenomenon is labelled ex-ante moral hazard (Ehrlich and Becker 1972). Pauly (1968) argued about the role of ex-post moral hazard in health insurance, which stems from the fact that the cost of an individual's excess usage of healthcare is spread over all other purchasers of insurance. This free-rider problem causes the individual to not restrain his usage of care. Given the ex-ante and ex-post moral hazard, incomplete insurance in healthcare is optimal. This prediction is consistent with the idea advocated by Holmstrom (1979) that optimal insurance contracts should be incomplete to strike a balance between reducing risk and maintaining incentives for the individual.

5.9 As Akerlof (1970) predicts, when little information is available on the quality of a product prior to purchase, and the quality of the product is uncertain, quality deteriorates to the lowest level in an unregulated market. While reputation can partially mitigate this market failure, the design of healthcare systems must account for this market failure, which can otherwise lead to loss of consumer faith and resultant under-investment in healthcare.

## Hyperbolic tendencies

5.10 People tend to indulge in risky behavior that may not be in their self-interest. Examples include smoking, eating unhealthy food, delay in seeking care, not wearing masks or keeping

social distancing in the context of the pandemic. Such individual behavior may not only be sub-optimal for the individual but also create negative externalities for the entire healthcare system through higher costs and poorer outcomes. Typically, consumers tend to demand primary care less than the economically optimal levels as the price elasticity for this product/service is very high. For instance, among TB patients in Delhi who initially visited a qualified practitioner in 2012, the average length of time from when TB symptoms first appeared to when they reached a DOTS facility was 5.2 months (Kapoor et al, 2012). Similarly, India has very low rate of screening for cancers among women in the age bracket of 15-49 years at 22 per cent for cervical cancer, 10 per cent for breast cancer and 12 per cent for oral cancer when compared to 62 per cent, 59 per cent and 16 per cent respectively in OECD Countries (NFHS 4 and OECD 2015). In fact, the privately optimal preference for primary care may be so low that individuals may have to even be paid to use adequate primary care. Individuals also under-estimate health risks and may, therefore, not purchase adequate health insurance.

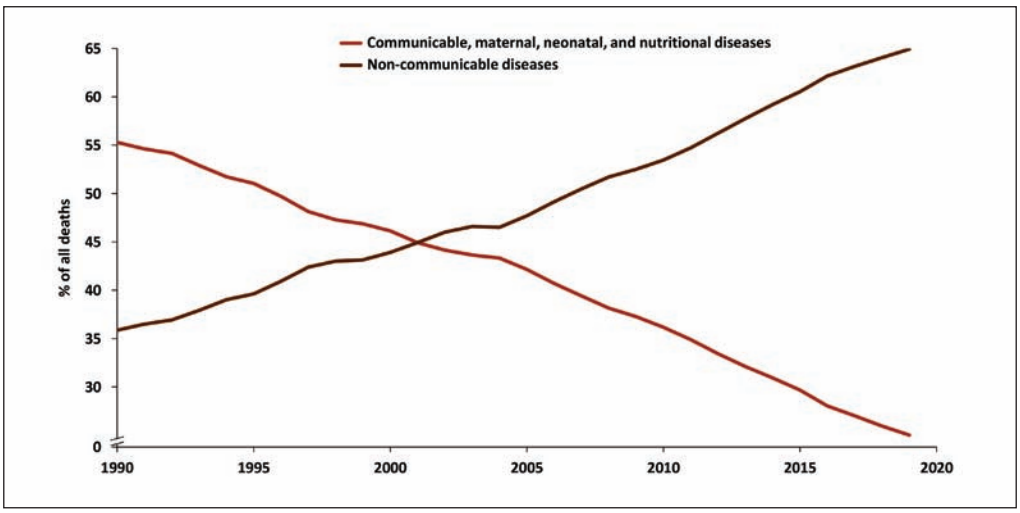
### Need for system design in healthcare

5.11 Given these market failures, a free market where individual consumers purchase services from providers on their own while paying at the point of service leads to severely sub-optimal outcomes including demand that can be influenced and induced by suppliers, over-seeking of hospitalization and under-seeking of primary care/public health when compared to economically optimal levels, and catastrophic out-of-pocket spending in part due to the low preference for health insurance. Therefore, *most well-functioning health systems are structured as oligopolies purchasing from oligopsonys instead of individual consumers purchasing from individual providers*. The structure of the market has substantial implications for long term trajectory of the health system. Countries with more fragmented health systems tend to have lower performance as reflected in higher costs, lower efficiency, and poor quality. Therefore, in addition to providing healthcare services and financing healthcare, a key role for the government is to *actively shape the structure of the healthcare market*.

## COVID-19 AND INDIA'S HEALTHCARE POLICY

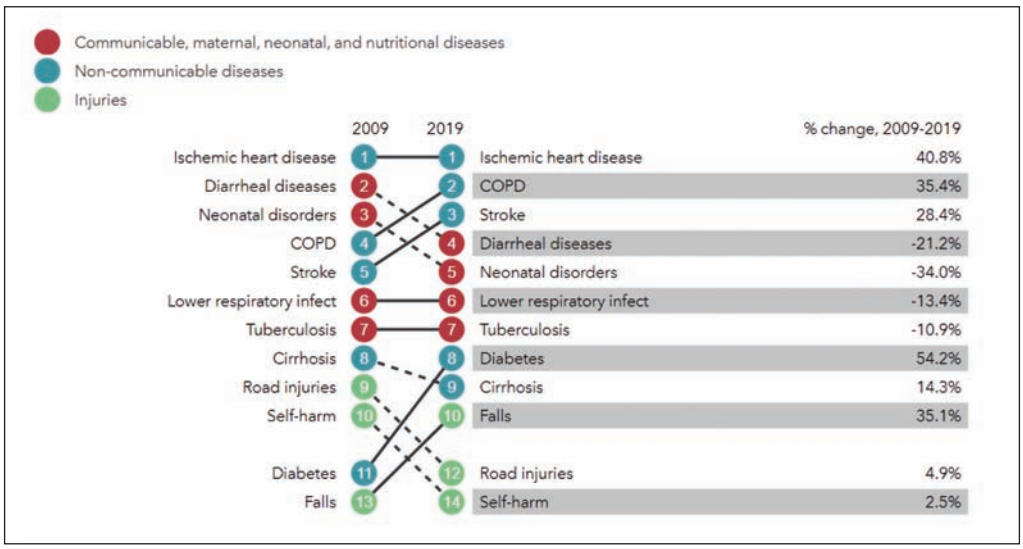
5.12 Following the COVID-19 pandemic, a key portfolio decision that healthcare policy must make is about the relative importance placed on communicable versus non-communicable diseases. The COVID-19 pandemic has spread worldwide because it is a communicable disease. The previous such pandemic occurred more than a century back when the Spanish Flu pandemic devastated the world in 1918. As pandemics represent rare events, healthcare policy can become a victim of "saliency bias", which involves over-weighting recent phenomena. 71 per cent of global deaths and about 65 per cent of deaths in India are caused by non-communicable diseases (NCDs) (Figure 4, Panel a). Between 1990 and 2016, the contribution of NCDs increased 37 per cent to 61 per cent of all deaths (National Health Portal, n.d.). Further, preventing communicable diseases requires focus on better sanitation and drinking water, which the Swachh Bharat and the Har Ghar Jal Abhiyan campaigns are focusing on.

**Figure 4 (Panel a): Proportion of communicable and non-communicable diseases in India**




Source: Global Burden of Diseases (2019)

**Figure 4 (Panel b): NCD's: one among top 10 reasons for deaths**



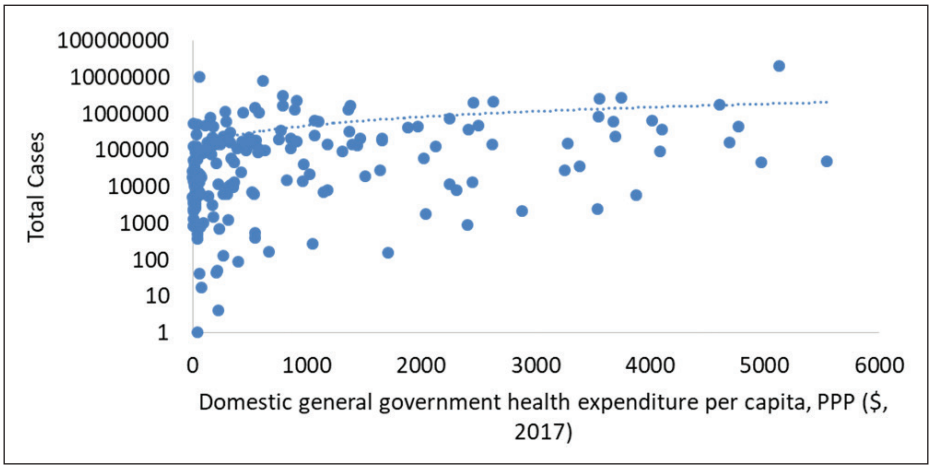

Source: Institute for Health Metrics and Evaluation

## Better healthcare infrastructure is no insurance against communicable disease

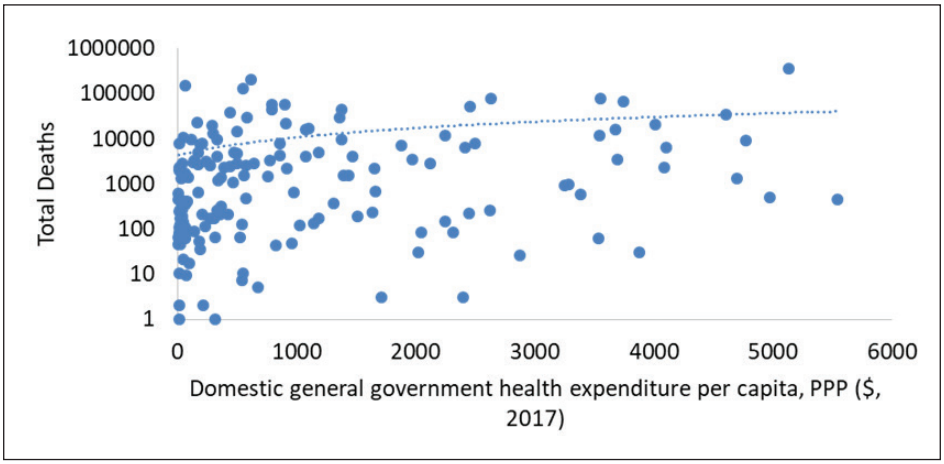
5.13 As the evidence below illustrates (Figure 5), faced with such a devastating pandemic, even the infrastructure created by greater healthcare spending in the advanced economies could not deal with the disease burden created by the pandemic. We observe positive correlations between total number of cases and deaths with respect to health expenditure per capita implying better health infrastructure. So, better health infrastructure is no guarantee that a country would be able to deal better with devastating pandemics like COVID-19. As the next health crisis could possibly be drastically different from COVID-19, the focus must be on building the healthcare system generally rather than a specific focus on communicable diseases.

**Figure 5: Correlation of COVID-19 cases/deaths and Per Capita Health Expenditure**

**Panel A**




**Panel B**




## INDIAN HEALTHCARE CURRENTLY

5.14 Despite improvements in healthcare access and quality (healthcare access and quality scored at 41.2 in 2016, up from 24.7 in 1990), India continues to underperform in comparison to other Low and Lower Middle Income (LMIC) countries. On quality and access of healthcare, India was ranked 145th out of 180 countries (Global Burden of Disease Study 2016). Only few sub-Saharan countries, some pacific islands, Nepal and Pakistan were ranked below India.

### Poor health outcomes

5.15 As seen in Figure 6, despite improvements in MMR and IMR, India still needs to improve significantly on these metrics. Countries such as China, Bangladesh, Bhutan, Cambodia, etc. have improved much more on these metrics than India.

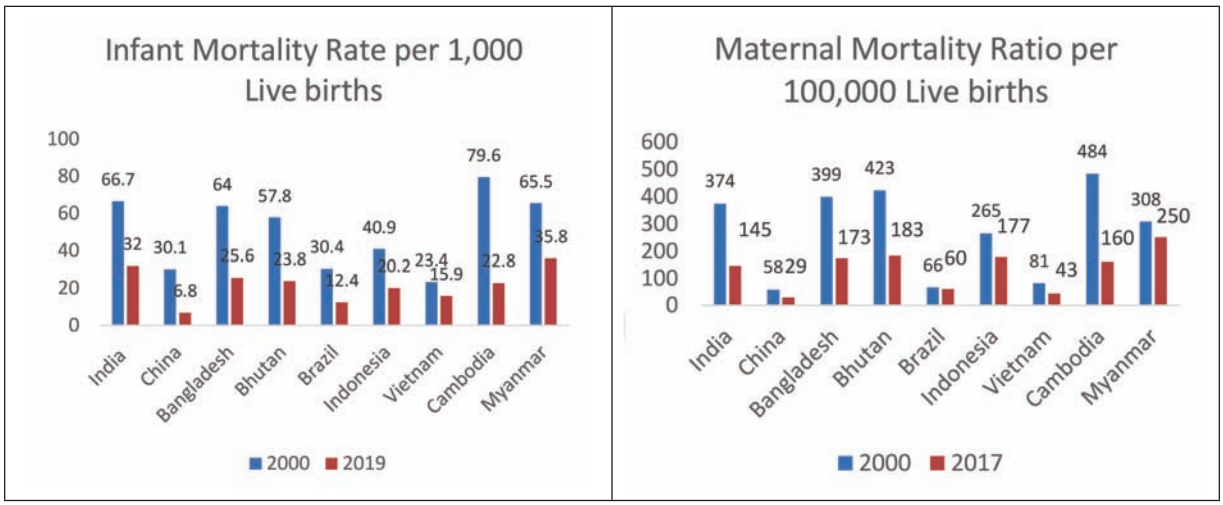
### Low access and utilisation

5.16 At 3-4 per cent, the hospitalisation rates in India are among the lowest in the world; the average for middle income countries is 8-9 per cent and 13-17 per cent for OECD countries

(OECD Statistics). Given the increasing burden of NCD, lower life expectancy, higher MMR and IMR, the low hospitalisation rates are unlikely to reflect a more healthy population as compared to middle income or OECD countries. Thus, the low hospitalisation rates reflect lower access and utilisation of healthcare in India.

**Figure 6: IMR and MMR in India and other countries**

**Panel A** **Panel B**

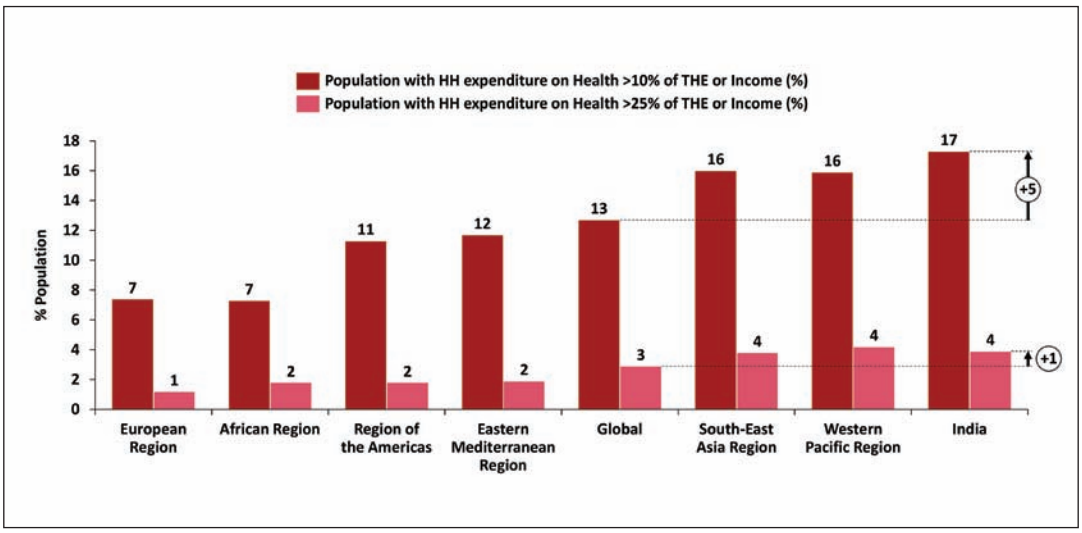



Source: World Bank

## High out-of-pocket health expenditures

5.17 As shown in Figure 3 and supported by Figure 7 below, India has one of the highest levels of OOPE in the world.

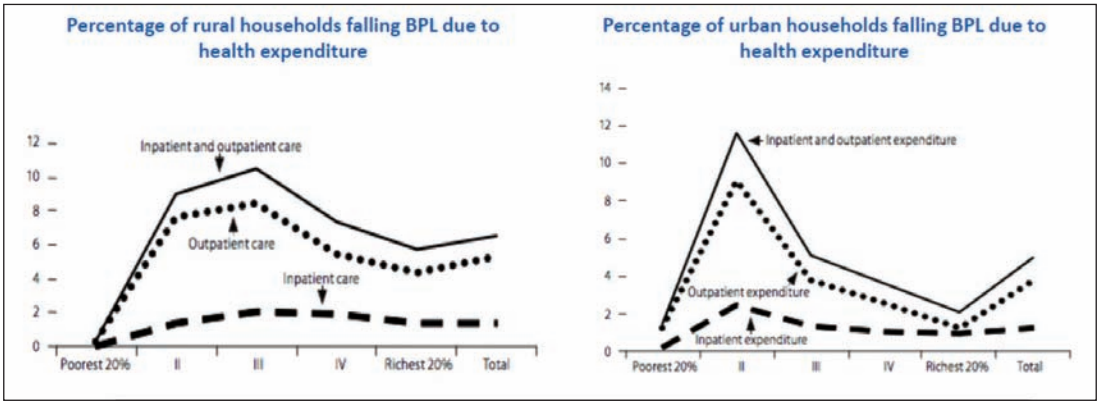
**Figure 7: Comparison of Health Expenditure across different regions**




Source: World Health Statistics 2020

## Though decreasing in recent years, inequity persists in availability of healthcare

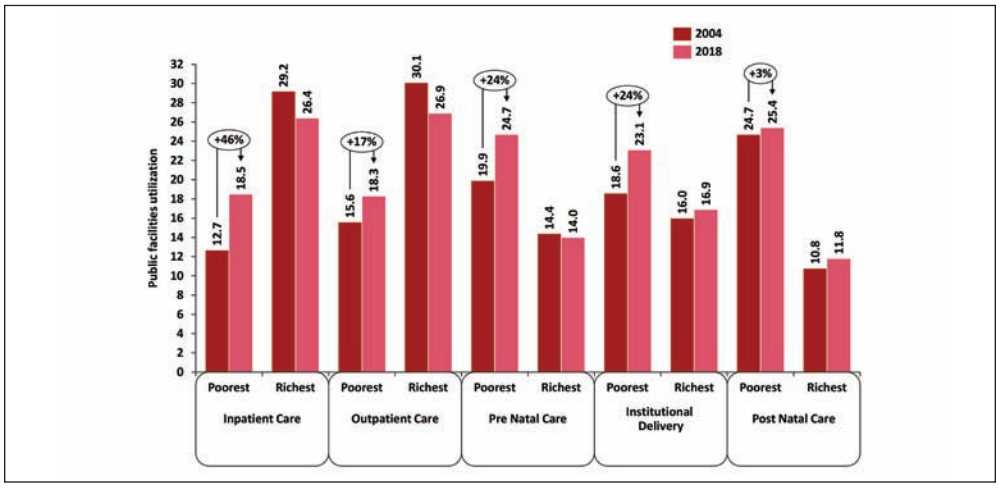
**Figure 8: Households falling below poverty line (BPL) due to health expenditure**




Source: Berman et al 2017

5.18 However, recent data show that the distribution of the public subsidy has improved in favour of the poor, more clearly in maternity and child healthcare. Earlier studies have argued that public sector-based healthcare has been pro-rich (or aggressive) (Berman et al. 2017). This had resulted in poor households being disproportionately impacted by OOPE and pushed below the poverty line (Figure 8). In recent times, the percentage of the poorest utilising prenatal care through public facilities has increased from 19.9 per cent to 24.7 per cent from 2004 to 2018, and there is a similar increase in the percentage of the poor accessing institutional delivery as well as post-natal care (Figure 9). The poorest utilising inpatient care and outpatient care has increased from 12.7 per cent to 18.5 per cent and from 15.6 per cent to 18.3 per cent. At the same time, both inpatient and outpatient utilisation among the richest dropped from 29.2 per cent to 26.4 per cent and 30.1 per cent to 26.9 per cent, respectively.

**Figure 9: Increasing equity in healthcare (2004-18)**

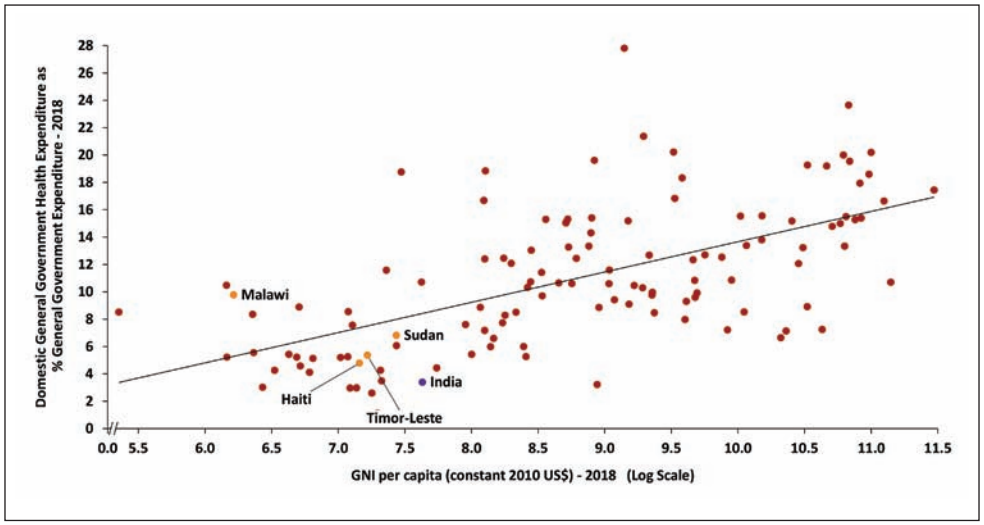



Source: Survey computation based on NSSO (2004) & NSSO (2018)

## Low budget allocations for healthcare

5.19 As health is a state subject in India, spending on healthcare by states matters the most when examining government healthcare spending. According to National Health Accounts, 2017, 66 per cent of spending on healthcare is done by the states. India ranks 179th out of 189 countries in prioritization accorded to health in its government budgets (consolidated union & state government). As Figure 10 shows, this prioritisation of health in India is similar to donor-dependent countries such as Haiti and Sudan, and well short of its peers in development.

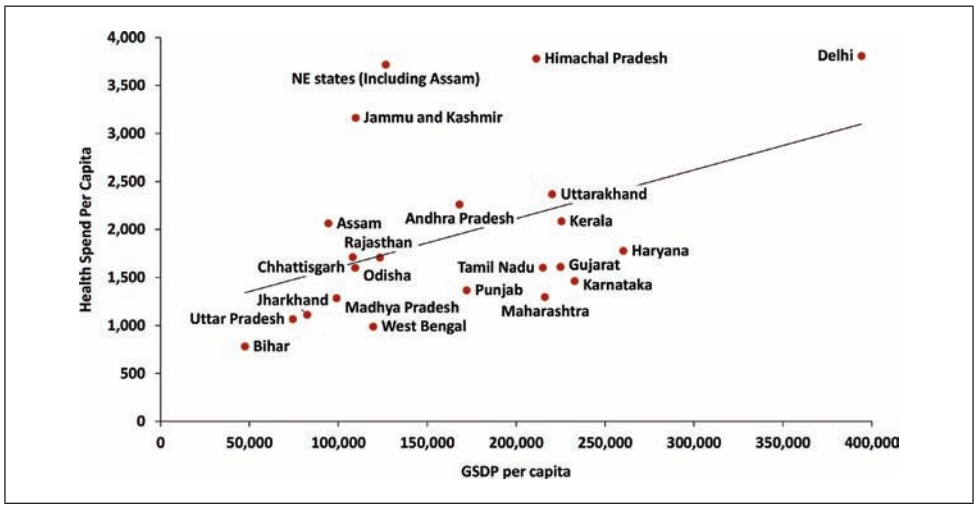
**Figure 10: Public Health Spend as percentage of Total Government Budget for different countries (centre and state combined)**

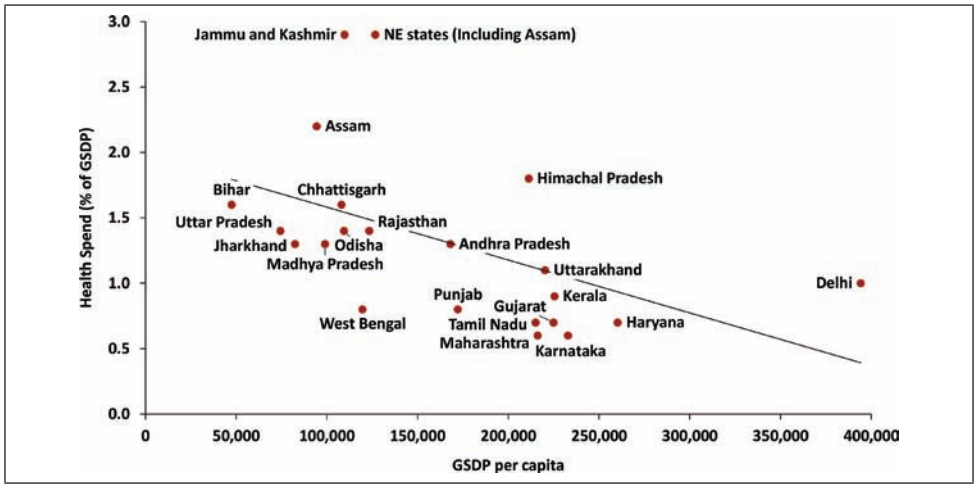



Source: World Bank and WHO (Global Health Expenditure Data Base)

5.20 The state expenditure on healthcare is highly variable across states and is not fully explained by the income level of the state. Figure 11 illustrates the same: while healthcare spending per capita increases with the GSDP per capita, healthcare spending as a per cent of GSDP decreases with the GSDP per capita. Thus, the richer states are spending a lower proportion of their GSDP on healthcare.

**Figure 11: Healthcare spending across different Indian States**

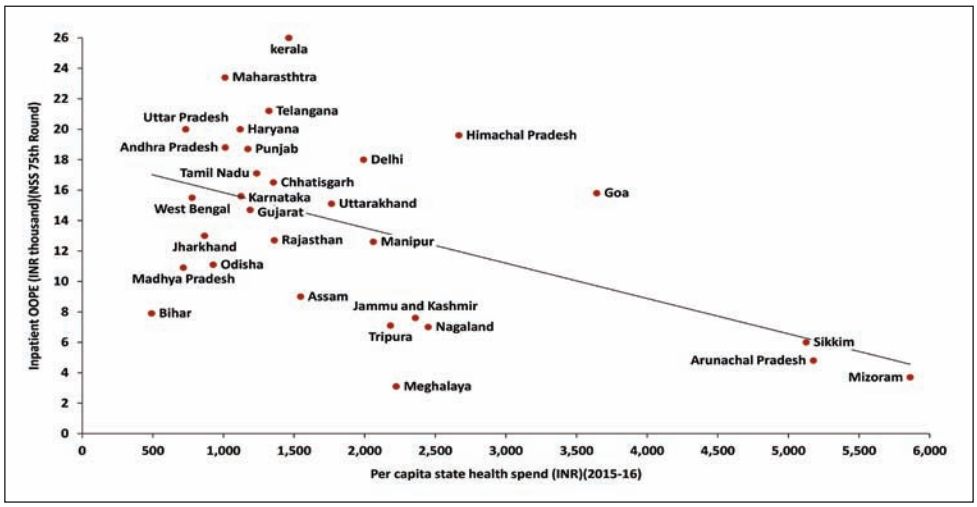





Source: National Health Systems Resource Centre 2017

5.21 The states that have higher per capita spending have lower out-of-pocket expenditure, which also holds true at global level. Hence, there is need for higher public spending on healthcare to reduce OOP. As the evidence in Figure 3 clearly demonstrates, an increase in public spending to 2.5-3 per cent can substantially reduce OOP from the current level of 60 per cent to 30 per cent. Therefore, the richer states should especially target increasing the healthcare spending as a per cent of GDP to 2.5-3 per cent (Figure 12).

**Figure 12: Correlation between state health spending and inpatient OOPE**




Source: Survey computations based on NSSO data

## Low human resources for health

5.22 Health status of any country crucially depends on the available health infrastructure in general and human resources for health. Several research studies, using cross-country data, have highlighted a positive causal link between the availability of the health workforce in a healthcare system and health outcomes (Jadhav et al, 2019, Choudhury and Mohanty 2020, Anand and Bärnighausen 2004). World Health Organization (WHO) identified an aggregate density of health workers to be 44.5 per 10,000 population and an adequate skill-mix of health workers to achieve composite SDG tracer indicators index by 2030 (WHO 2019). The WHO

also specified a lower range of 23 health workers per 10,000 population to achieve 80 per cent of births attended by skilled health professionals.

5.23 Although aggregate human resources for health density in India is close to the lower threshold of 23, the distribution of health workforce across states is lop-sided. Also, the skill mix (doctor/nurse-midwives ratio) is far from adequate. State-level variations in the density of health workers and the skill mix reflects that while Kerala and Jammu and Kashmir have a high density of doctors, states like Punjab, Himachal Pradesh and Chhattisgarh have a larger number of nurses and midwives but a very low density of doctors. Andhra Pradesh, Delhi and Tamil Nadu reflect a better balance of doctors and nurses and midwives (Figure 13 and 14).

**Figure 13: Density of doctors and Nurses/Midwives in different Indian states**

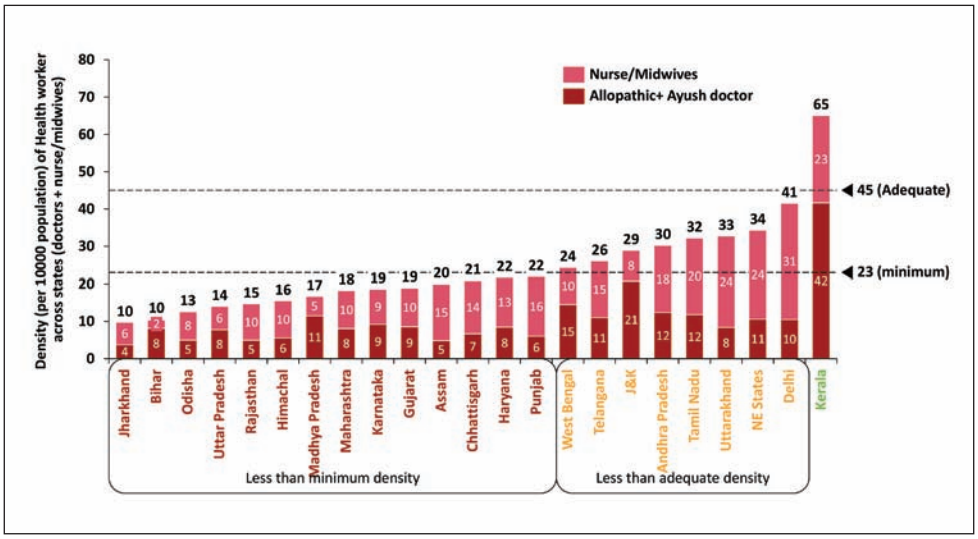
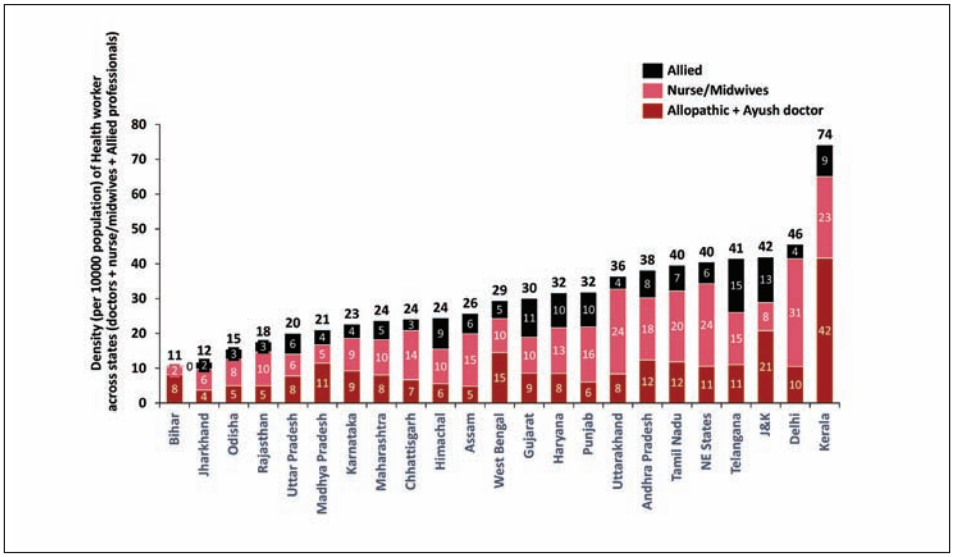



**Figure 14: Density of doctors, Nurses/Midwives and Allied professionals in different Indian states**

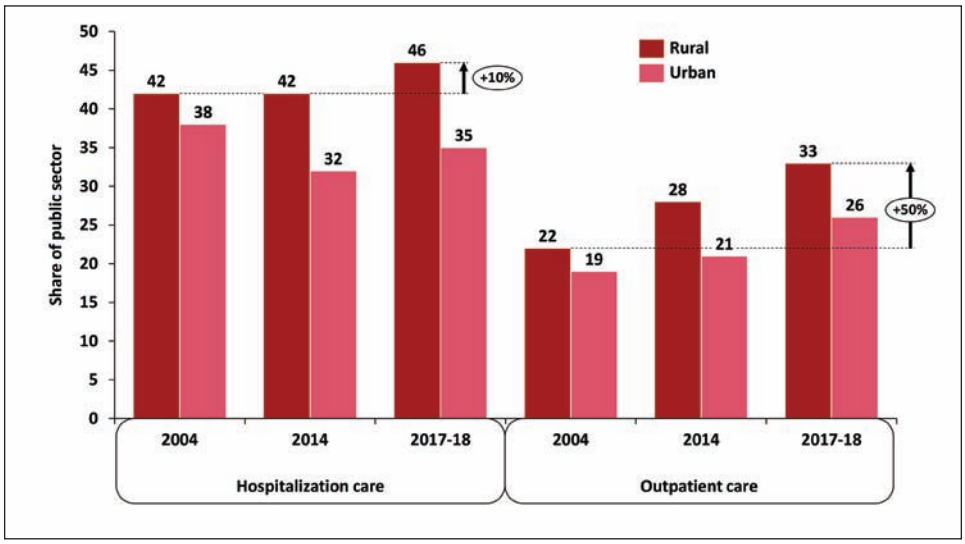



Source: Periodic Labour Force Survey 2017-18 (Ministry of Statistics & Programme Implementation 2019) and Population Projection for 2018 (Census of India 2020).

## UNREGULATED PRIVATE ENTERPRISE IN AN INDUSTRY MARKED BY HIGH LEVEL OF MARKET FAILURE

5.24 While the share of public institutions has increased both in hospital and outpatient cares, the private sector dominates in total healthcare provision in India. Around 74 per cent of outpatient care and 65 per cent of hospitalisation care is provided through the private sector in urban India (Figure 15).

**Figure 15: Share (per cent) of public sector in total healthcare, hospitalisation care and outpatient care**




Source: NSSO, various rounds.

5.25 The significant market failures that stem from information asymmetries in the healthcare sector were highlighted earlier. Therefore, unregulated private enterprise can create significant negative effects. For instance, Kurk et al. (2018) highlight that a large proportion of deaths in India manifests due to poor quality of healthcare than due to insufficient access; this proportion is significantly higher than neighbouring countries (Figure 16) and other countries in the world (Figure 17).

**Figure 16: Poor care quality leads to more deaths than insufficient access to healthcare**

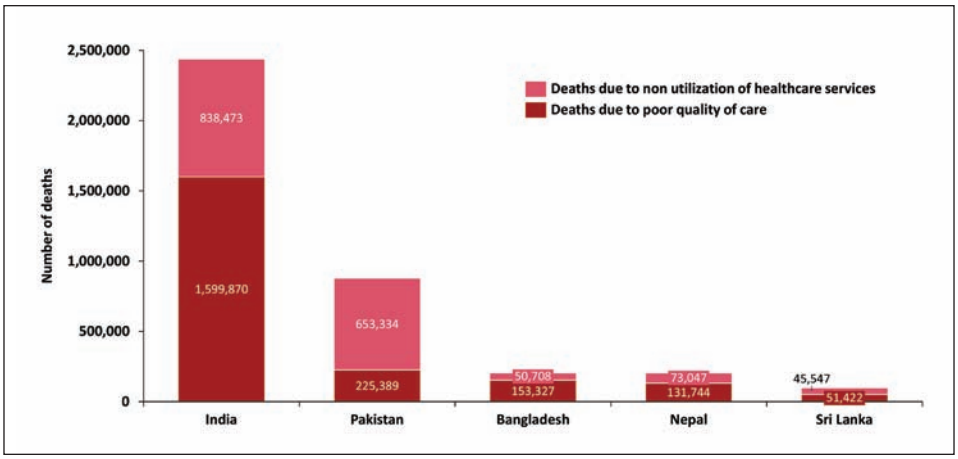
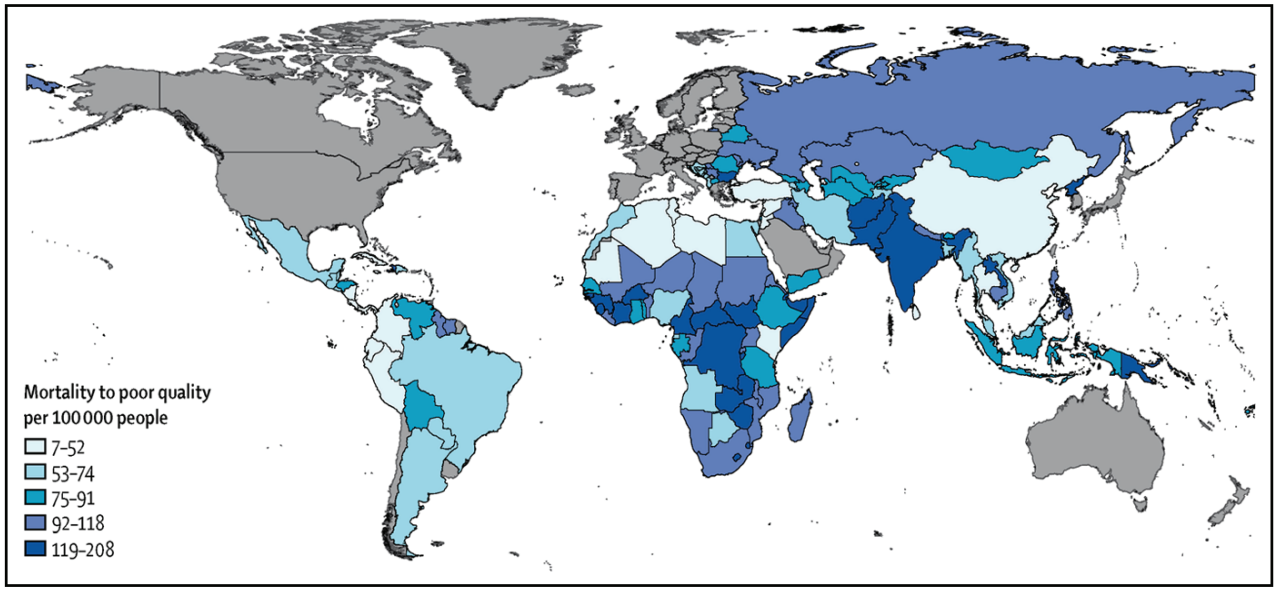


**Figure 17: Mortality due to poor quality health care by country**




5.26 In fact, Kane and Calnan (2017) highlight the erosion of trust in the Indian healthcare sector. To understand the difference in quality between the public and private sector providers, we use data from PMJAY. Among the most common metrics of quality in the hospital setting is unplanned readmissions (Mohpal et al., 2020). Readmissions typically impose a heavy burden on patients and their families and on health systems in general as a result of unnecessary care. In general, readmissions are costlier than original admissions. Using the data till November 2019, it is observed that the average claim amount in a readmission case is INR 19,295 compared to INR 12,652 in the corresponding original case. The average length of stay is also higher in the readmission, 7.5 days versus 6.6 days. Crucially, the data shows that the mortality rate for neonatal procedures is much higher in private hospitals than in public hospitals, 3.84 per cent and 0.61 per cent respectively. Public sector patients get readmitted to the same hospital 64 per cent of the time versus 70 per cent for private hospitals. About 3/4$^{th}$ of outpatient care and 2/3rd of hospitalisation care is provided through the private sector. So, a large proportion of deaths in India manifesting due to poor quality of healthcare is likely to reflect that the quality of treatment in the private sector may not be significantly better than that in the public sector in India. (Basu et al, 2012, Kumar and Prakash 2011, Coarasa et al, 2014, Russo 2015)

5.27 The problem of asymmetric information in healthcare is also reflected in the substantial variation in costs for treating the same disease between public and private sector. As argued above, the quality of treatment in the private sector does not seem to be markedly better in the private sector when compared to the public sector. Yet, the costs of treatment are not only uniformly higher in the private sector, the differences are humongous for in-patient treatments of severe illnesses such as cancers (3.7x), cardio (6.8x), injuries (5.9x), gastro (6.2x), and respiratory (5.2x) (NSSO data, Figure 18 and 19).

5.28 Given the market failures stemming from significant asymmetric information, an unregulated private healthcare system is clearly sub-optimal compared to a system where policies mitigate the problem of asymmetric information. Parallels can be drawn from banking and financial intermediation – another industry that suffers from significant market failures due to asymmetric information – to design policies for mitigating these market failures.

**Figure 18: Substantial variation in costs for treating the same disease between public and private sector (outpatient care)**

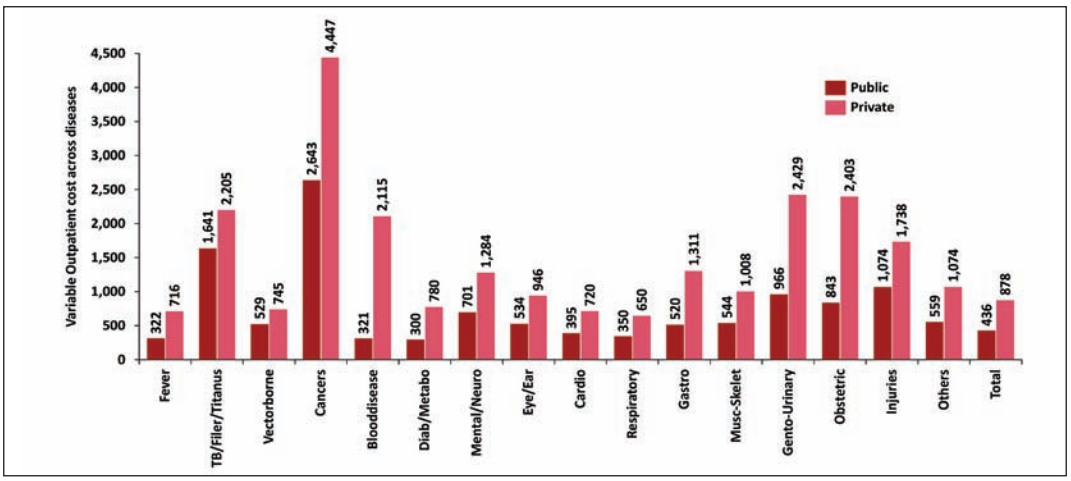
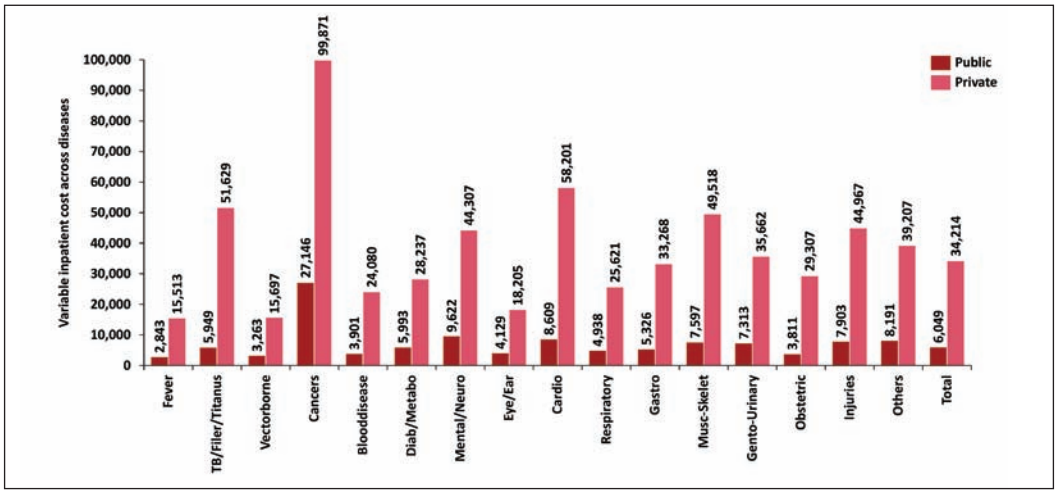



**Figure 19: Substantial variation in costs for treating the same disease between public and private sector (Inpatient care)**




5.29 Credit rating agencies mitigate the information asymmetry faced by investors when investing in the debt of a firm. Specifically, credit rating agencies assess the likelihood of the firm repaying the debt that is takes from the investors, thereby the quality of the firm borrowing the money. Similarly, healthcare policymakers should consider creating agencies to assess the quality of the healthcare providers – both doctors and hospitals. The Quality and Outcomes Framework (QOF) introduced by the National Health Service (NHS) in the United Kingdom 2004 as well as other quality assessment practices introduced by NHS provide a good example. The NHS quality assessment practices included national standards for the major chronic diseases, annual appraisal of all doctors working in the NHS, and widespread use of clinical audits to compare practices, sometimes with public release of data. These should be evaluated carefully and considered for implementation.

5.30 Credit bureaus assess the quality of individual borrowers by assigning them credit scores, thereby mitigating the information asymmetry faced by a bank or financial institution in lending to the individual borrower. In the healthcare context, insurers as well as healthcare providers

suffer from similar information asymmetry about the patient. As argued in Chapter 4 ("Data of the people, by the people, for the people") of the Economic Survey 2018-19, data from The National Digital health mission can be utilised even within the framework of data privacy. By utilising such data with the aid of artificial intelligence and machine learning algorithms, the predictive aspects can be used to mitigate information asymmetry with respect to the patients. Therefore, information utilities *a la* the credit bureaus should be evaluated and considered.

5.31 Finally, given the information asymmetries that make unregulated private enterprise sub-optimal in healthcare, a sectoral regulator that undertakes regulation and supervision of the healthcare sector must be seriously considered. This is especially pertinent as regulation has grown in importance as a key lever for governments to affect the quantity, quality, safety and distribution of services in health systems (Clarke 2016). Please see Table 1 below for regulation in other countries (Schweppenstedde et al, 2014).

**Table 1: International Experience in Regulating Healthcare**

| Country | Source of standards | Content of standards | Experience |
|---|---|---|---|
| Australia | National Safety and Quality Health Service (NSQHS) Standards developed by the Australian Commission on Safety and Quality in Health Care (ACSQHC) are part of the Australian Health Services Safety and Quality Accreditation Scheme endorsed by the Australian health ministers in 2010. | The Standards provide a set of measures that can be applied across services and settings nd used as quality assurance mechanism for providers to test whether minimum standards are met or as quality improvement mechanism for goal development. Other national standards include quality of care principles as part of nursing home accreditation, mental health standards, and standards for child day care and also out-of-home care. The ACSQHC also produced an Australian Safety and Quality Framework for Health Care in 2010 that sets out three core principles (consumer-centered care, driven by information, and organized for safety), plus 21 areas of action for improvement. | Regulatory activity to improve healthcare safety and quality has increased considerably during the last decade. The national and state governments have passed legislation and have established government and quasi-government bodies. Some essential and mandatory quality standards have been introduced, despite the strong preference in the health and social care sectors towards voluntary guidelines and developmental improvements. Mechanisms for enforcing such standards are not well developed and tend to rely on internal rather than external mechanism. The regulatory regime in Australia relies largely on networked governance which is being built via three strategies. First, the division of responsibilities in Australia's federal system of government. Second, networked governance requires extensive consultation among the many public and |

| | | | |
|---|---|---|---|
| | | | private stakeholders in mixed systems of health and social care. Third, governance in complex health and social sectors requires the engagement of professionals. |
| England | National standards for the delivery of care services were first introduced following the 2000 NHS Plan, with the regulatory framework supporting implementation undergoing reform since. | The 2008 Health and Social Care Act sets the framework for regulations by securing that any service provided in the carrying out of a regulated activity is of appropriate quality. The stipulations for this are defined further as a set of 16 essential standards of quality and safety' in service provision which are to be implemented by providers in health and social care (and currently regulated by the Care Quality Commission); the 16 standards concern care and welfare of service users; assessing and monitoring the quality of service provision; safeguarding service users from abuse; cleanliness and infection control; management of medicines; meeting nutritional needs; safety and suitability of premises; safety, Availability and suitability of equipment; respecting and involving service users; consent to care and treatment; complaints; records; and requirements relating to workers. The essential standards are due to be updated, alongside the inspection and assessment approach, for April 2014. | Following the 2012 Health and Social Care Act, the NHS in England has undergone considerable change, with reform implementation continuing. In addition to regulators professional statutory bodies also have an important role in England. it is conceivable that the roles and responsibilities of the respective organizations in England is expected to change as new structures and governance arrangements are being implemented. Currently, they use a mix of enforcement and punishment to ensure compliance. |

| | | | |
|---|---|---|---|
| Finland | The Finnish Constitution sets out the requirement that government must provide adequate care for all, providing the legal foundation for national regulation such as the 1992 Act on the Status and Rights of Patients. | It sets out patients' right to information, informed consent to treatment, the right to see any relevant medical documents, the right to complain and the right to autonomy. Further national legislation defines the quality and standards of healthcare. There are national standards for selected specific service categories, such as elderly care. | Health system governance is shared by the center and the municipalities. Standards of care are practically embedded within the Finnish constitution, which provides the legal foundation for national regulation. The Finnish regulatory system can be characterized by a system of self-regulation and voluntarism, with some aspects of meta-regulation such as mandated continuous improvement; external clinical audit; mandated incident reporting system; consumer complaints through Valvira as main national regulatory body, the Regional State Administration, and the ombudsman. |
| Germany | The Social Code Book sets the regulatory framework for major actors, their roles and obligations in the statutory health insurance (SHI) system. Thus, quality and effectiveness measures of services within the SHI system have to comply with the current level of medical knowledge and take account of required technical quality. Service providers must safeguard and develop the quality of services they provide. | Stipulations set out in the Social Code Book are further defined by the Federal Joint Committee (G-BA), which issues binding directives on treatments, quality assurance and minimum standards of care, which are implemented by SHI funds, hospitals and associations of physicians. Areas of regulation are: quality management; external quality assurance; cross-sectoral quality assurance; regulation on quality of structures, processes and outcomes; regulation on assessment and monitoring of services by SHI-accredited physicians. | Regulation of healthcare in Germany's federal system is shared between the federal and state governments and corporatist actors. A 2010 hospital quality report included quality data from almost 1,800 hospitals and showed that, compared to 2009, 65 quality indicators had improved. However, for the majority of quality indicators (n = 236), there was no change, while deterioration was observed for 8 indicators. Evaluations of the activities of regulatory bodies remain limited. The G-BA, dominated by corporatist actors, was delegated a high degree of decision-making power concerning the definition of the health basket and is non-transparent. |

| | | | |
|---|---|---|---|
| Netherlands | The Dutch government has defined quality of care in terms of effectiveness (clinical effectiveness; patient safety), patient-centeredness and cost-efficiency, which form the basis of the regulatory system and national regulation. | National-level regulation provides for the overall requirements for quality of care to be defined further by professional bodies on how to meet these requirements in a way that safeguards quality and delivers 'responsible care' (verantwoorde zorg). For example, the 1996 Quality Act makes quality systems mandatory for all healthcare institutions (excluding GPs and dentists), further stipulating that healthcare institutions have to provide 'responsible care' (defined as care being of a good level, suitable, patient- and needs-oriented); to provide a structure that allows for the delivery of responsible care and communicate how they achieve/maintain it; to systematically monitor, control and improve quality of care; to publish annual reports on quality management and quality delivered. | The Dutch regulatory framework uses a mixture of policy instruments to safeguard the quality and safety of healthcare. The system relies to a great extent on self-regulation and voluntarism, through for example having the medical profession define 'verantwoorde zorg', develop clinical guidelines and medical training programmes, and having a voluntary system of external accreditation. Hout et al. (2010) argued, that the Dutch supervisory regime is characterized by comparatively low formal intervention rates, of around 10–15 per cent. This may be because of the time required to work through cases and the potential risk of creating mistrust and frustration among actors in the healthcare sector. Friele et al. (2009) reviewed the regulatory instruments of the 2006 Health Care Market Regulation Act (Wmg) and noted that the Dutch Health Care Authority (NZa) appears to opt for acting in a less interventionist way. The fragmented system of healthcare governance at central level for the cure and care sectors, and decentralized governance responsibilities for social care and public health, can be seen to increase the risk for inequity in healthcare provision. |

| | | | |
|---|---|---|---|
| USA | The 2010 Affordable Care Act required the Department of Health and Human Services (DHHS) to develop a National Strategy for the Improvement of Heath Care (National Quality strategy). The Nursing Home Reform act (OBRA'87) deals with nursing home regulation. | The National Quality Strategy is a developing strategy guided by DHHS as an attempt to set national aims and priorities in healthcare quality improvement. The strategy has three aims: better care, healthy people and communities, and affordable care. The OBRA'87 deals with nursing home regulation; it defines regulatory standards for nursing homes at the federal level, supplemented by individual state laws. | Regulatory activity in the USA is for the most part decentralized with multiple local governmental and private sector agencies involved in assuring quality. Each state licenses healthcare facilities within its territory. US General Accountability Office (GAO) often reviews the actions and activities of CMS and other healthcare agencies in government. The GAO has published criticism of the limited use of regulatory powers with regard to nursing homes. The National Quality Strategy is an attempt to unify and streamline the efforts of diverse federal agencies involved in healthcare, with input from private sector stakeholders. |

## INFORMATION ASYMMETRY IN INDIA'S PRIVATE INSURANCE MARKETS

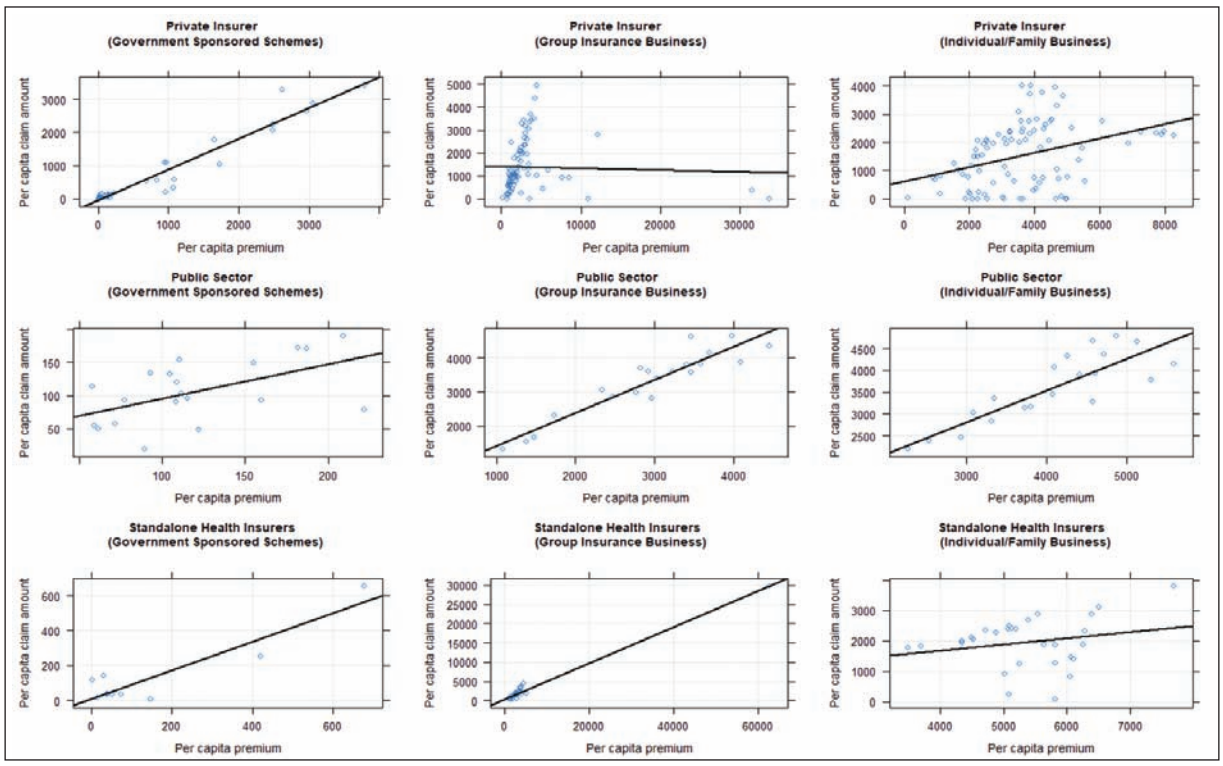
### Box 1: Empirical strategy to identify information asymmetry in insurance markets

**The empirical literature on testing for information asymmetry in insurance markets** can be traced back to the seminal articles of Chiappori and Salanie´ (2000, 2003). Rooted in Chiappori and Salanie´ (2000, 2003), these studies propose a variety of reduced-form correlational tests to statistically demonstrate the existence of asymmetric information. The basic idea is to compare claims rates consumers, who have identical observed characteristics, but have self-selected into different insurance policies (Puelz and Snow 1994, Cawley and Philipson 1999, Cardon and Hendel 2001, Finkelstein and Poterba 2004, 2006, Cohen 2005, and Finkelstein and McGarry 2006). A positive correlation between insurance coverage and claims – after controlling for all observable characteristics so that the two individuals being compared as identical on observable characteristics – provides evidence of asymmetric information. This could result either because of adverse selection (with greater-risk taking individuals self-selecting into the more expensive, high feature contract) or moral hazard (because individuals behave differently under the two contracts).

5.32 To examine asymmetric information in the Indian insurance market, the empirical analysis is conducted using insurer-specific yearly time-series data secured from IRDA. The unit of analysis is an insurer of a specific insurer type (i.e., private, public sector or standalone) underwriting a specific insurance-type (government-sponsored, group insurance or individual/

family floater) of health insurance from years 2015-2019. The bivariate patterns between per-capita premium and per-capita claim amount for the nine combinations (three insurer types for each of the three insurance types) are illustrated in Figure 20. Figure 20 also includes a linear trend line for each of the scatter plots. An upward sloping trend line is noticeable for all scenarios but one (i.e., private insurer underwriting group-insurance schemes).

**Figure 20: Correlation Patterns Between Per-Capita Premium and Per-Capita Claim Amount**



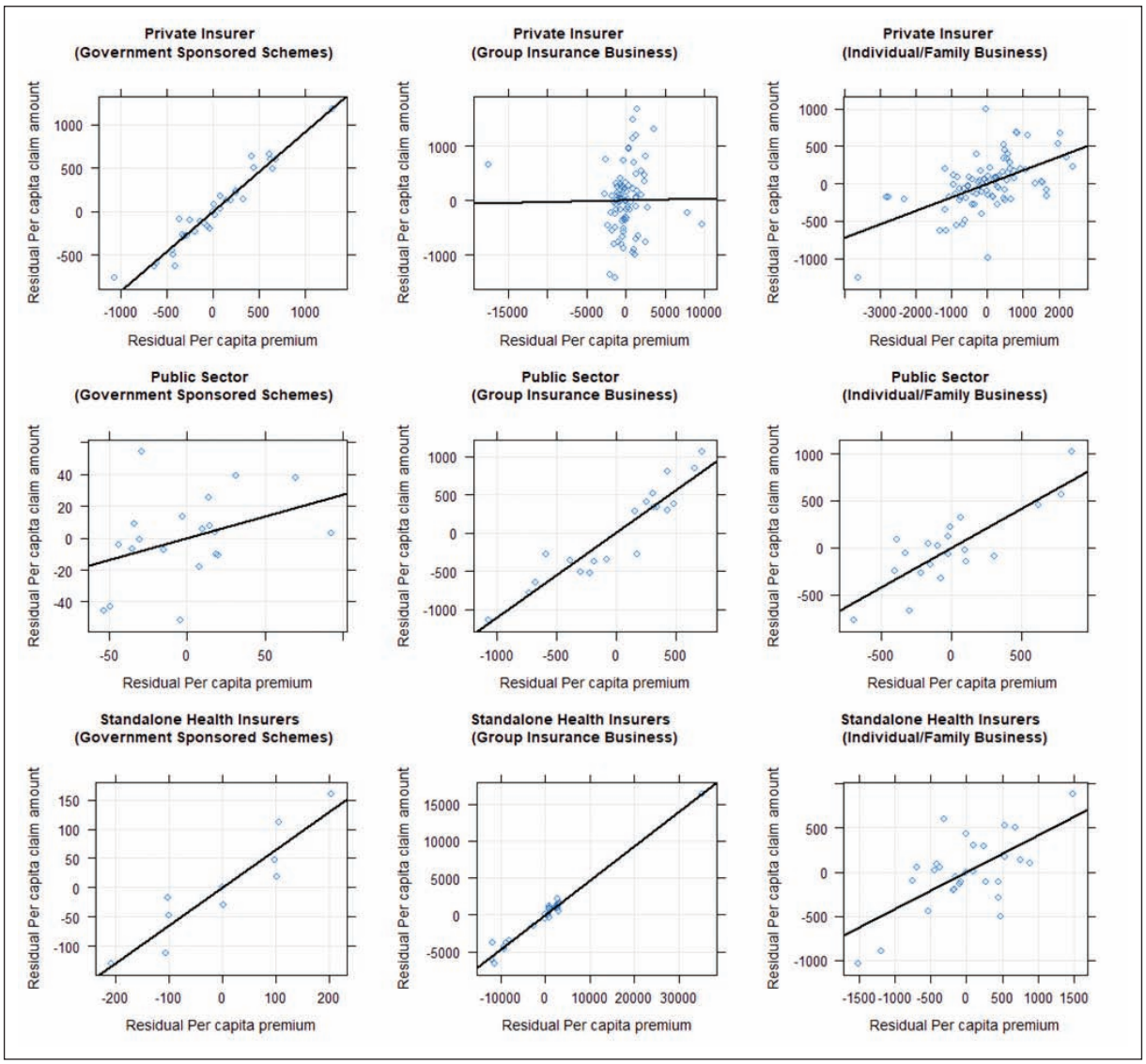

5.33 To rule out any unobservable differences between insurance providers and time-varying aggregate shocks that may systematically impact both per-capita premiums and per-capita claim amount, we examine the same correlation after including a fixed effect for each insurer and for each year. Figure 21 shows that the results shown in Figure 20 remain unaltered even after controlling for these unobservable differences.

**Table 2: Conditional Pearson Correlation Between Per-Capita Premium and Per-Capita Claim Amount after controlling for insurer fixed effects and year fixed effects**

| | Conditional Correlations | | |
|---|---|---|---|
| **Type of Insurer** | **Government Sponsored** | **Group Insurance** | **Individual/ Family** |
| Private | **0.968*** ** | -0.040 | **0.361*** ** |
| Public Sector | **0.544** ** | **0.935*** ** | **0.850*** ** |
| Standalone | **0.916*** ** | **0.990*** ** | 0.226 |

Note: *p<0.01; **p<0.05; ***p<0.01

**Figure 21: Conditional Correlation of Residuals after controlling for insurer fixed effects and year fixed effects**

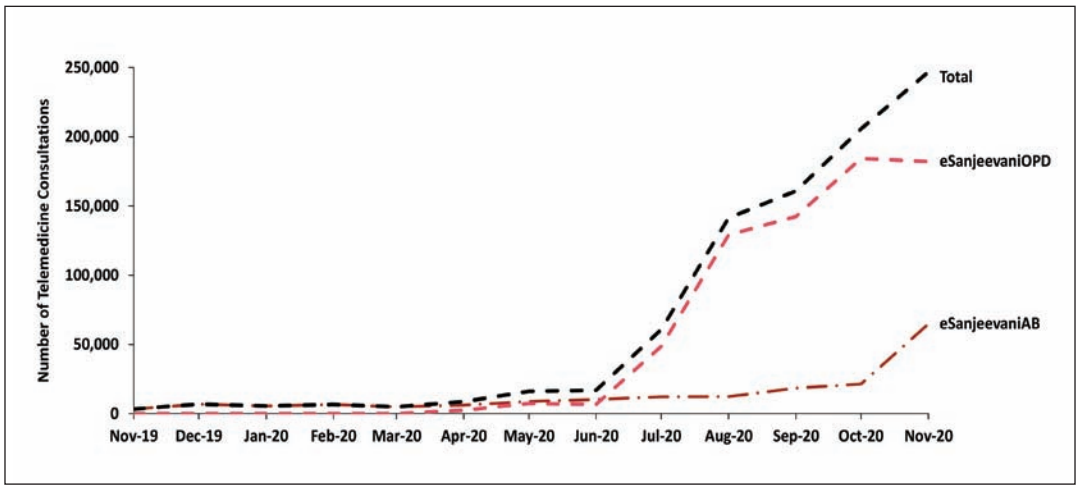



5.34 Table 2 shows the conditional Pearson correlations after controlling for insurer and year fixed effects. The evidence highlights clearly the presence of asymmetric information in the Indian private health insurance market.

## TELEMEDICINE

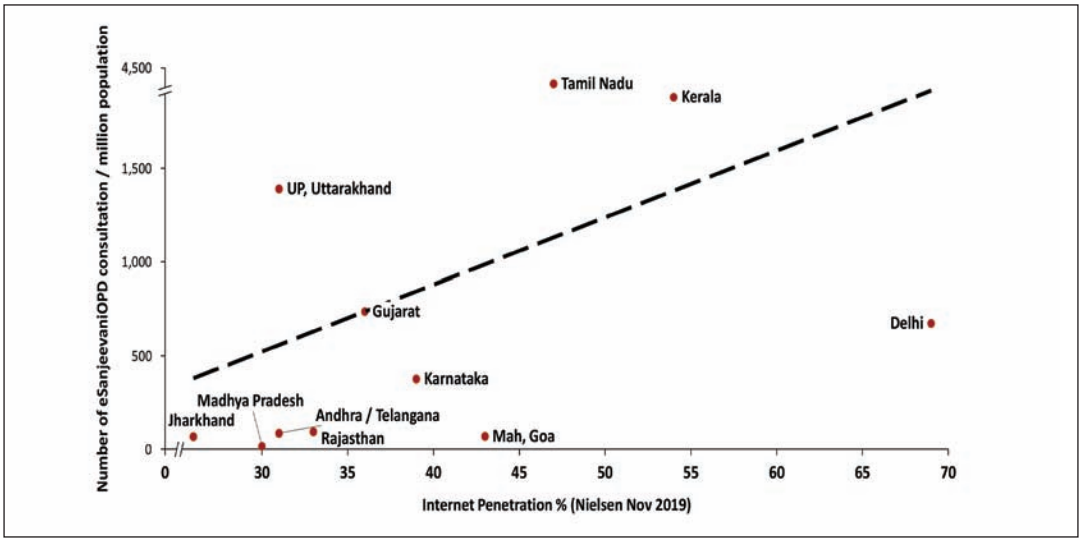
5.35 Impressive growth has been seen in the adoption of telemedicine in India since the outbreak of the COVID-19 pandemic. This coincided with the imposition of lockdown in India and the issuance of the Telemedicine Practice Guidelines 2020 by the Ministry of Health and Family Welfare (MoHFW) on March 25, 2020. eSanjeevani OPD (a patient-to-doctor tele-consultation system) has recorded almost a million consultations since its launch in April 2020, as seen in Figure 22. Similar growth was also reported by Practo, which mentioned a 500 per cent increase in online consultations (varying from 200 to 700 per cent across different specialties) in just three months.

**Figure 22: Number of eSanjeevani consultations (November 2019 to November 2020)**




Source: PIB Delhi 2020.

**Figure 23: Correlation between eSanjeevani consultations reported and Internet penetration in the state**




5.36 Figure 23 shows that the number of telemedicine consultations correlates strongly with the Internet penetration in a state. Thus, the success of telemedicine critically hinges on having decent level of health infrastructure and Internet connectivity nationwide. Specifically, investing in Internet access, can lead to greater uptake of telemedicine, which in turn can greatly help reduce geographic disparities in healthcare access and utilization.

## CONCLUSIONS AND POLICY SUGGESTIONS

5.37 The recent COVID-19 pandemic has emphasised the importance of healthcare, whereby a healthcare crisis transformed into an economic and social crisis. Considering the same and in striving to achieve the SDG target of Universal Healthcare Coverage, India must take steps to improve healthcare accessibility and affordability in the country. Yet, healthcare policy must not become beholden to "saliency bias", where policy over-weights a recent phenomenon that may represent a six-sigma event. This is especially pertinent given the fact that countries with

much higher healthcare investments and concomitant health infrastructure have struggled to contain the pandemic. The next health crisis may not possibly involve a communicable disease. Therefore, India's healthcare policy must continue focusing on its long-term healthcare priorities. Simultaneously, to enable India to respond to pandemics, the health infrastructure must be agile. For instance, every hospital may be equipped so that at least one ward in the hospital can be quickly modified to respond to a national health emergency while caring for the normal diseases in usual times. Research in building such health infrastructure can guide how to build such flexible wards.

5.38 The ongoing COVID-19 pandemic has helped showcase the role of technology-enabled platforms as an alternate distribution channel for remote delivery of healthcare services. These technology-enabled platforms offer a promising new avenue to address India's last-mile healthcare access and delivery challenges. These technology platforms coupled with digitisation and the promise of artificial intelligence at-scale, have led to a drastic uptake in the utilisation of telemedicine for primary care and mental health. Given India's unique last mile challenges, such technology-enabled solutions need to be harnessed to the fullest. As we show, telemedicine depends crucially on internet connectivity and health infrastructure. Therefore, both Central and the State governments need to invest in telemedicine on a mission mode to complement the government's digital health mission and thereby enable greater access to the masses.

5.39 The National Health mission has played a critical role in mitigating inequity in healthcare access. The percentage of the poorest utilising prenatal care through public facilities has increased from 19.9 per cent to 24.7 per cent from 2004 to 2018. Similarly, the percentage of the poorest accessing institutional delivery increased from 18.6 per cent to 23.1 per cent and from 24.7 per cent to 25.4 per cent for post-natal care. The poorest utilising inpatient care and outpatient care has increased from 12.7 per cent to 18.5 per cent and from 15.6 per cent to 18.3 per cent. Therefore in conjunction with Ayushman Bharat, the emphasis on NHM should continue.

5.40 From a financial perspective, India has one of the highest levels of OOPE in the world, contributing directly to the high incidence of catastrophic expenditures and poverty. A negative correlation exists between the level of public spend and OOPE both across countries and states. In fact, at small levels of public spend (less than 3 per cent of GDP), even marginal increases in public spend generate substantial "bang for the buck" in reducing the OOPE. An increase in public spend from 1 per cent to 2.5-3 per cent of GDP – envisaged in the National Health Policy 2017 – can decrease the OOPE from 65 per cent to 30 per cent of overall healthcare spend. As Chapter 9 in this volume shows, PMJAY has been a marquee evolution in this direction, providing financial affordability to a large percentage of the Indian population.

5.41 As a bulk of the healthcare in India is provided by the private sector, it is critical for policymakers to mitigate information asymmetry in healthcare, which creates market failures and thereby renders unregulated private healthcare sub-optimal. Therefore, information utilities that help mitigate the information asymmetry can be very useful in enhancing overall welfare. The Quality and Outcomes Framework (QOF) introduced by the National Health Service (NHS) in the United Kingdom 2004 as well as other quality assessment practices introduced by NHS provide a good example in this context. These should be evaluated carefully and considered for implementation. Similarly, data from the National Digital health mission can be utilised even

within the framework of data privacy with the aid of artificial intelligence and machine learning algorithms to mitigate information asymmetry with respect to the patients. A standardised system for quality reporting on healthcare for hospitals, physicians and insurance companies can start with basic input indicators to be reported mandatorily by every healthcare stakeholder. Over time, this can evolve to cover output and outcome indicators such as infection rates and re-admission rates. A start has been made in this direction by the Niti Aayog through the Health Index at the state level. Finally, a sectoral regulator to undertake regulation and supervision of the healthcare sector must be seriously considered. This is especially pertinent as regulation has grown in importance as a key lever for governments to affect the quantity, quality, safety and distribution of services in health systems (Clarke 2016).

5.42 With limited visibility into patients' medical records and no standardised treatment protocols, insurance companies have a risk of adverse selection at the time of policy issuance and a risk of moral hazard at the time of claims. To safeguard against this risks, insurance companies resort to high premiums and restriction of services covered in the insurance policy. Addressing this information asymmetry can help lower premiums, enable the offering of better products and help increase the insurance penetration in the country.

## CHAPTER AT A GLANCE

- The recent COVID-19 pandemic has emphasised the importance of healthcare sector and its inter-linkages with other key sectors of the economy. The ongoing pandemic has showcased how a healthcare crisis can get transformed into an economic and social crisis.
- Healthcare policy must not become beholden to "saliency bias", where policy over-weights a recent phenomenon. To enable India to respond to pandemics, the health infrastructure must be agile.
- The National Health mission (NHM) has played a critical role in mitigating inequity as the access of the poorest to pre-natal and post-natal care as well as institutional deliveries has increased significantly. Therefore, in conjunction to with Ayushman Bharat, the emphasis on NHM should continue.
- An increase in public spend from 1 per cent to 2.5-3 per cent of GDP – as envisaged in the National Health Policy 2017 – can decrease the OOPE from 65 per cent to 30 per cent of overall healthcare spend.
- A sectoral regulator to undertake regulation and supervision of the healthcare sector must be considered given the market failures stemming from information asymmetry; WHO also highlights the growing importance of the same.
- The mitigation of information asymmetry would also help lower insurance premiums, enable the offering of better products and help increase the insurance penetration in the country. Information utilities that help mitigate the information asymmetry in healthcare sector can be very useful in enhancing overall welfare.
- Telemedicine needs to be harnessed to the fullest by investing in internet connectivity and health infrastructure.

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# Process Reforms: Enabling decision-making under uncertainty

06
CHAPTER

*International comparisons show that the problems of India's administrative processes derive less from lack of compliance to processes or regulatory standards, but from over-regulation. In this chapter, the issue of over-regulation is illustrated through a study of time and procedures taken for a company to undergo voluntary liquidation in India. Even when there is no dispute/ litigation and all paperwork is complete, it takes 1570 days to be stuck off from the records. This is an order of magnitude longer than what it takes in other countries.*

*Using the framework of incomplete contracts, the chapter argues that the problem of over-regulation and opacity in Indian administrative processes flows from the emphasis on having complete regulations that account for every possible outcome. This is due to the inadequate appreciation of the difference between 'Regulation' and 'Supervision', on the one hand, and the inevitability of incomplete regulations, on the other hand. Real-world regulation is inevitably incomplete because of the combination of: (i) bounded rationality due to "unknown unknowns", (ii) complexity involved in framing "complete" contracts across all possible contingencies, and (iii) the difficulty for a third party to verify decisions. This makes some discretion unavoidable in decision making. The evidence shows that over-regulation, not simpler regulation, leads to opaque decision making.*

*The problem is that policymakers, by default, tend to favour prescriptive regulation over supervision. Unlike supervision, regulation can be easily measured. After all, regulations provide criteria or checklists, making it easier for regulators to follow and reduce their accountability later on. In contrast, it is difficult to quantify the amount and quality of supervision.*

*The optimal solution is to have simple regulations combined with transparent decision-making process. Having provided the government decision maker with discretion, it is important then to balance it with three things- improved transparency, stronger systems of ex-ante accountability (such as bank boards) and ex-post resolution mechanisms. As an illustration, the chapter shows how the new Government e Marketplace (GeM portal) has increased the transparency in pricing in government procurement. This has not only reduced the cost of procurement but has also made it easier for the honest government official to make decisions.*

## THE PROBLEM OF REGULATORY EFFECTIVENESS

6.1 It is often believed that India's regulatory problems are due to the lack of regulatory standards and poor compliance to process. International comparisons, however, show that India ranks better than its peers on having regulatory standards in place and compliance to process. The real issue seems to be effectiveness of regulations caused by undue delays, rent seeking, complex regulations and quality of regulation.

6.2 The 'World Rule of Law Index' published by the World Justice Project[1] provides cross country comparison on various aspects of regulatory enforcement. The index has various sub-categories, which capture compliance to due processes, effectiveness, timelines, etc. In 2020, India's rank is 45 out of 128 countries in the category of 'Due process is respected in administrative proceedings' (proxy for following due process). In contrast, in the category 'Government regulations are effectively enforced' (proxy for regulatory quality/effectiveness), the country's rank is 104 (Table 1). India stands at 89th rank in 'Administrative Proceedings are conducted without unreasonable delay' (proxy for timeliness) and 107th in 'Administrative Proceedings are applied and enforced without improper influence' (proxy for rent seeking). This shows that, contrary to the popular belief, India is relatively good at complying with processes, but lag in regulatory effectiveness.

6.3 In fact, India's performance has improved significantly in following due process in administrative proceedings, with its rank improving from 72 in 2015 (out of 102 countries) to 45 in 2020 (out of 128 countries). In contrast, it has deteriorated over time on certain other parameters. This makes it clear that having regulations and enforcing process is one thing, whereas their effectiveness is another.

**Table 1: India's rank in various categories of regulatory enforcement**

| | 2015 | 2020 |
|---|---|---|
| **Regulatory Enforcement overall rank** | 69 | 74 |
| Government regulations are effectively enforced | 87 | 104 |
| Government regulations are applied and enforced without improper influence | 74 | 107 |
| Administrative proceedings are conducted without unreasonable delay | 75 | 89 |
| Due process is respected in administrative proceedings | 72 | 45 |
| Number of Countries | 102 | 128 |

Source: World Justice Project

6.4 The index shows that United Kingdom, United States, Singapore and Canada are placed much better than India in case of both, following due process and regulatory effectiveness. However, the gap between India and these counties is much wider in regulatory effectiveness than in due processes being followed. Similarly, India is placed better than other BRICS countries (barring South Africa) in terms of respecting due process, but, worse than them in the effectiveness of those standards (Table 2).

[1] World Justice Project was found in 2006 as an initiative of the American Bar Association and became an independent Non-Profit organisation in 2009. The data published by World Justice Project is used by World Bank in its World Governance Indicators.

**Table 2: Comparison of regulatory standards and regulatory enforcement in 2020**

| Rank | US | UK | Singapore | Canada | Brazil | Russia | China | South Africa | India |
|---|---|---|---|---|---|---|---|---|---|
| **Regulatory Enforcement** | 20 | 13 | 3 | 11 | 60 | 73 | 67 | 45 | 74 |
| Government regulations are effectively enforced | 20 | 11 | 5 | 12 | 62 | 47 | 63 | 92 | 104 |
| Government regulations are applied and enforced without improper influence | 16 | 9 | 4 | 8 | 64 | 83 | 63 | 59 | 107 |
| Administrative proceedings are conducted without unreasonable delay | 33 | 13 | 1 | 17 | 124 | 24 | 23 | 48 | 89 |
| Due process is respected in administrative proceedings | 18 | 12 | 7 | 5 | 55 | 97 | 98 | 25 | 45 |

Source: World Justice Project (2020)

6.5 The same conclusion can be derived from various World Bank studies. Its Regulatory Quality Index[2] shows that despite improvement in India's regulatory quality since 2013 (Figure 1), it is still much lower than UK, US, Singapore, Japan etc. (Figure 2). Similarly, the World Bank's Ease of Doing Business (EoDB) report (2020) shows that despite making huge strides in the overall EoDB rank, India still lags behind in the sub-categories 'Starting a business' and 'Registering Property' where the country's rank is 136 and 154 respectively. The report points out that this is due to the high number of procedures required to legally start and formally operate a company as well as the time and cost consumed to complete each procedure.

**Figure 1: Regulatory Quality in India**

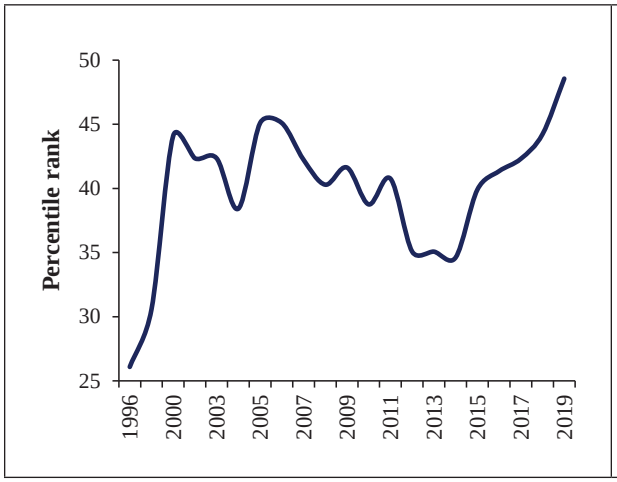
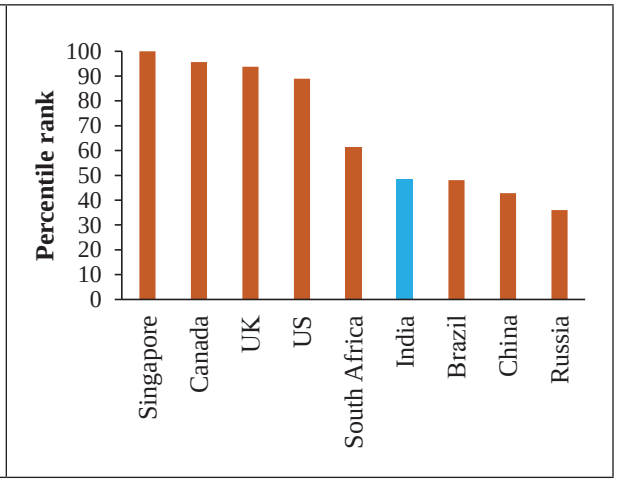



**Figure 2: Cross country comparison of regulatory quality (as of 2019)**




Source: World Bank (2019)
Note: In Figure 1 and 2, higher number indicates improvement (unlike in other rankings)

[2]Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. This is a part of Worldwide Governance Indicators (WGI) of World Bank.

6.6 As an illustration of unnecessary regulation in India, take the case of voluntary closure of a company. A study by *Quality Council of India* (done for Economic Survey) shows that the time taken from point of decision of closure to actually the company getting struck off from the Registrar of Companies is 1570 days (i.e. 4.3 years), even if all paperwork is in place and the company is not involved in any litigation or dispute. This is the best possible case of a routine activity. Interestingly, out of the total time taken, about 1035 days are taken for clearances by Income Tax, Provident Fund, GST departments and in taking back security refunds from various departments (Table 3). In contrast, voluntary liquidation takes about 12 months in Singapore, 12-24 months in Germany and 15 months in UK. In Germany, for very large and active companies, it takes 2-4 years. Given the likelihood of disputes and litigation, for the comparable large cases it may take upto a decade in India.

**Table 3: Timelines and procedures faced by companies in voluntary liquidation in India (even when there is no litigation/dispute)**

| Timeline (days) | Procedures |
|---|---|
| **T** | Company's decision to close its business operations in India |
| **T +16** | Passing of Board resolution by the Company to close its business operations in India |
| **T + 20 to T + 70** | Public announcement, communication to employees and strategizing transition of legal entity to liquidator |
| **T + 70 to T + 110** | • Exit by majority of employees; Communication to vendors<br>• Identification of physical data and records and Digitization of key physical records<br>• Introduction of professional firm for bookkeeping activity going forward<br>• Undertaking sale/ realization and disposal of movable assets |
| **T + 110 to T + 200** | • Discontinuance of business operations and termination of contracts<br>• Intimating income tax authorities<br>• Exit by remaining key employees; Completion of asset disposal process<br>• Completion of identified pending statutory compliances and closure process with government bodies monitoring industrial functions.<br>• seeking no dues certificate from all the vendors<br>• Identification and appointment of resident Indian director during the period of voluntary liquidation process till the order for dissolution is passed by NCLT* |
| **T + 200 to T + 270** | • Appointment of new Board members including Indian resident Director*<br>• Cessation of banking operations in existing bank accounts to mitigate risk of financial misappropriation<br>• Undertaking compliances under secretarial law and IBC, towards commencement of voluntary liquidation |
| **T + 270** | • Passing of shareholder's resolution for commencement of voluntary liquidation and appointment of liquidator |

| | |
|---|---|
| **T + 300** | • Intimating about commencement of voluntary liquidation and appointment of liquidator to Income tax, RoC, IBBI, GST authorities and PF department.<br>• Public announcement in newspapers inviting claims<br>• Opening a designated bank account for cash and liquid funds<br>• Closure of existing bank account(s) and transfer of funds to designated bank account |
| **T + 315** | • Preparation and submission of preliminary report to shareholders of Corporate Debtor |
| **T + 315 to T + 1350** | **Income tax[3]**<br>• Completion of on-going and new assessment proceedings, appellate litigation and submission of responses to various notices, simultaneously.<br>• Furnishing a bank guarantee from principal shareholder of the Corporate Debtor with income tax authorities to obtain tax NOC.<br>**Provident Fund (PF)[4]**<br>• Filing for closure of EPF account of establishment with regional PF authorities<br>**GST registration**<br>• Periodic statutory compliances (payment of tax under reverse charge and returns filing)<br>• Surrendering GST registration towards completion of voluntary liquidation process<br>**Foreign exchange laws***<br>• Reporting under Foreign exchange laws to be verified at the time of discussions with Authorized dealers bank, for requisite documents to process final remittance to the shareholders.<br>**Communication from ex-employees and Claims from operational credits**<br>• Frequent requests from ex-employees reg PF portal of the company<br>• Claims from operational creditors post 30-day claim period from liquidation commencement date<br>**Security deposit from government bodies**<br>• Refund of security amount deposited by Corporate Debtor at the time of registration/ obtain licenses with government bodies |
| **T + 1350 to T + 1360** | • Final remittance to shareholders and deposit of applicable withholding taxes thereon Completion of voluntary liquidation process<br>• Closure of designated bank account |
| **T + 1360 to T + 1370** | • Submission of final report to shareholders, RoC, IBBI and NCLT (along with dissolution petition)<br>• Filing of application with dissolution of Corporate Debtors with NCLT |
| **T + 1430** | • Scheduled date of first hearing of NCLT<br>• NCLT's order seeking reports/ reply from income tax department, RoC and IBBI |

[3]Bank guarantee from principal shareholder of Corporate Debtor was furnished with income tax authorities and tax NOC was obtained after ~ 1000 days from filing of intimation.

[4]Inspection proceedings by PF authorities concluded in ~ 370 days and subsequently, inquiry in relation to payment of interest and damages on payment of PF shortfall was initiated, concluded in another ~ 300 days.

| | |
|---|---|
| **T + 1430 to T + 1515** | • Follow-up with income tax department, RoC and IBBI, confirm receipt of NCLT order and request for their timely response<br>• Address queries raised by respective authorities |
| **T + 1515** | • Scheduled date of second hearing of NCLT<br>• Bring on record the reports/ reply from income tax department, RoC and IBBI |
| **T + 1515 to T + 1540** | • Pass the order for dissolution of Corporate Debtor, subject to satisfaction of reports/ replies submitted by income tax department, RoC and IBBI |
| **T + 1540 to T + 1570** | • File copy of order for dissolution of Corporate Debtor with RoC vide Form INC 28<br>• RoC to strike-off the name of Corporate Debtor from Register of Companies |

Source: QCI study for Economic Survey
Note: * Procedures are applicable only in case of an Indian subsidiary of foreign company.

## THE INEVITABILITY OF INCOMPLETE REGULATIONS

6.7 The problem of over-regulation stems from not recognizing the inevitability of incomplete contracts and regulations in a world of uncertainty. Real world contracts are inherently incomplete because of three key reasons that reinforce one another's influence. First, as Herbert Simon has highlighted in his the Nobel-prize winning work, humans are boundedly rational because the future comprises of "unknown unknowns." Note that radical uncertainty of "unknown unknowns" is fundamentally different from the notion of risk as defined by Frank Knight. Second, as another Noble-prize winning work on incomplete contracts by Oliver Hart highlights, complexity in framing contracts arises from the difficulties involved in anticipating and specifying all obligations for all parties in full across all possible contingencies. In fact, with radical uncertainty, it is impossible to know the possible characteristics of all the future states of the world. Therefore, writing complete contracts that will efficiently fit every future situation is inherently impossible in the real world. Finally, because of these two features, a third party may be able to observe outcomes *ex-post* but cannot verify *ex-ante* decisions unambiguously.

6.8 Incomplete regulations become inevitable when the reality of incomplete contracts is acknowledged[5]. In theory, regulators and policymakers can choose to invest entirely in the drafting process by identifying every possible state of the world that might materialize and by specifying an appropriate solution to each state. But, in reality, they confront a vexing problem: the future is unknown and unknowable. As a result, when faced with uncertainty, it simply costs too much to foresee and then describe appropriately the contractual outcomes for all (or even most) of the conceivable states of the world. Thus, the reality of incomplete contracts leads to inevitability of incomplete regulation. This makes some discretion unavoidable.

6.9 In a complex and uncertain world, moreover, the actual outcomes or situations do not fit in the neat boxes assumed in the regulation; hence the supervisor has to exercise some judgment. There is a widespread belief, however, that ever more detailed regulations reduce discretion. On the contrary, complex rules and regulations create more discretion because of the multiple ways

5. A large literature in economics focuses on how incomplete regulations evolve from incomplete contracts. We refer the reader to Laffont (2005) for a comprehensive overview of the same

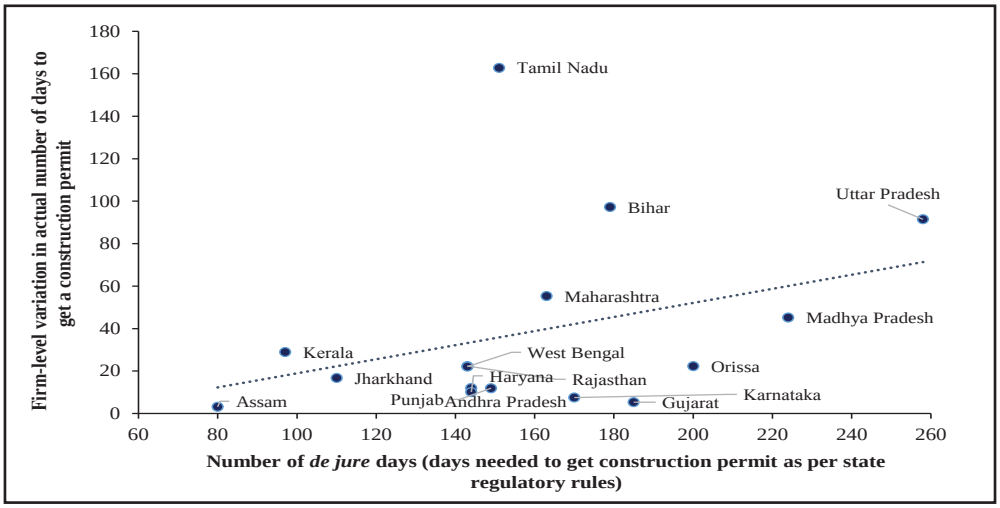
in which they can be interpreted. This is made worse by the opacity of increasingly complex rules which makes it difficult for a third party to monitor how the discretion was exercised. Black (2001) argues that "discretion and rules are not in a zero-sum relationship such that the more rules there are the less the discretion there is and visa-versa." In short, a complex, uncertain world makes discretion inevitable where over-regulation, not simpler regulation, leads to excessive and opaque discretion.

### *Evidence supporting the increase in discretion with over-regulation*

6.10 In their book "In Regulating Aged care: Ritualism and the New Pyramid", Braithwaite *et.al.* (2007) study the healthcare sector in the United States and provide evidence that is consistent with the above thesis. The book focuses on the impact of regulating care for the elderly. It was argued that inspectors manning the aged care homes had a lot of discretion. To change this scenario and reduce their discretion, the inspectors were provided with detailed protocols to audit. These standards were further broken into sub-standards and had reached over 500 federal standards, which were complemented by some state's specific standards by 1986. For instance, the Illinois code for nursing included over 5,000 care regulations. Consistent with the bounded rationality posited above, the authors found that inspectors could not cope up with the rise in these number of standards. Most of these standards were completely forgotten and only about 10 per cent of the standards were repeatedly used to make norms. The study notes that the results depended on the background of inspectors, such that *"If you've got a nurse, it will be nursing deficiencies in the survey report; if a pharmacist, you'll get pharmacy deficiencies; a lawyer, patient rights, etc."* The complex set of rules, in fact, gave more discretion to the inspector. Because of having complex and a large number of standards to check, idiosyncratic factors associated with the narrow expertise of the inspector caused particular standards to be checked in some homes, but neglected in others. Thus, the over-regulation caused endemic unreliability and defeated the whole purpose of having detailed regulations. The timelines associated with closing a clean company with no litigation/ dispute, which is described in Table 3 above, represent an example of this problem.

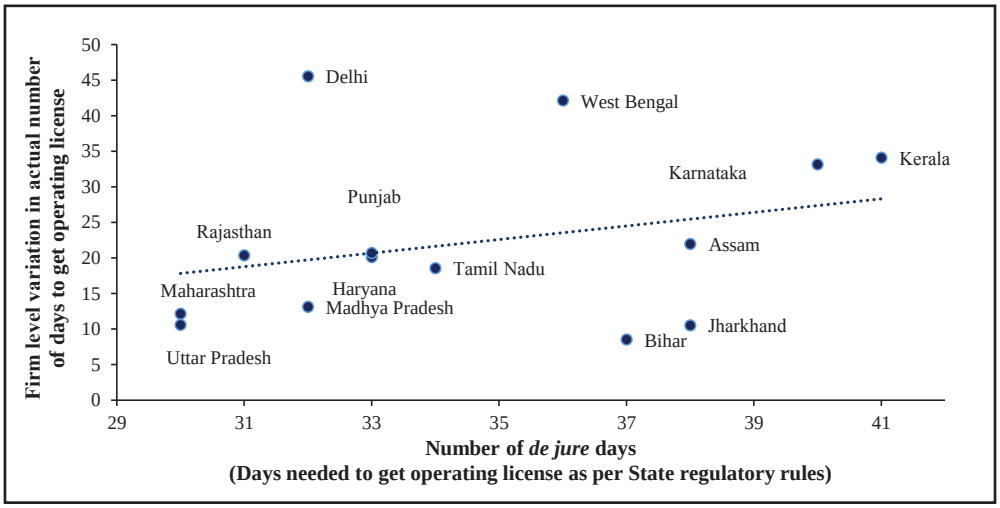
6.11 Similarly, Figures 3 and 4 provide large sample evidence across Indian states supporting the thesis that discretion increases with the amount of regulation. The evidence is adapted from Raj *et al.* (2018) who use the World Bank's Enterprise level surveys for India to undertake their analysis. In figure 3, the variation among firms in the actual days taken to provide a construction permit as a function of the number of *de jure* days taken to provide a construction permit, as per the regulatory rules for the same in the state are plotted. We see that an increase in the number of regulations, which is proxied by the increase in the *de jure* days to get the permit, correlates positively with the variation in the actual number of days taken. As variation against the *de jure* norm proxies the discretion exercised across the various applications from the firms, this shows that more the number of regulations, higher the discretion in implementing them in the case of award of construction permits. Figure 4 shows the same using the days taken to provide an operating license for a facility. Collectively, both these figures provide evidence consistent with the thesis that discretion increases with the number of regulations.

**Figure 3: Discretion in the granting of construction permits increases with *de jure* provisions**




Source: *Raj et al (2018);* Firm level variation is measured by standard deviation; higher variation proxies higher discretion

**Figure 4: Discretion in the granting of operating license increases with *de jure* provisions**




Source: *Raj et al (2018);* Firm level variation is measured by standard deviation

6.12 Kanbur & Ronconi (2016) show in their cross-country study on labor laws that the stringency of labour regulation (measured as fine for violation of minimum wage) correlates negatively with the intensity of its enforcement (measured as average medium imprisonment for the same). They argue that countries with more stringent labour codes are less likely to enforce them.

6.13 Finally, another illustration of the above thesis is the Dodd-Frank Act enacted post the Global Financial Crisis in United States, which spanned 848 pages and mandated 390 new rules. It was a well-intentioned attempt to fix what went wrong in the years leading up to 2008 crisis. One might think that this left little room for regulators to use their discretion. In fact, what happened was quite the contrary. Petrou (2012) argued that Dodd-Frank created a new kind of

risk that she labelled "complexity risk." For instance, the legislation requires bank boards to be responsible for 184 additional activities, which may be unnecessary — or even impossible.

6.14 This reveals that having more stringent regulation may actually mean that exercise of discretion on the ground is more, not less. Thus, it is clear that in a world full of uncertainty and complexity, it's not possible to substitute effective supervision with more prescriptive regulation. Note that employing third-party supervision cannot substitute the process of simplifying regulation to lower opaque discretion because as argued above verifiability of efforts and actions by any third party is minimal when contracts are incomplete. Therefore, the question then arises is how can we allow for discretion such that is not misused and leads to effective supervision.

## THE PROBLEM OF REGULATORY DEFAULT

6.15 From the discussion in the previous sections, it is clear that there is a need to create simple regulation and complement the same by providing flexibility and discretion to the supervisor. However, if the legal and institutional frameworks do not explicitly limit mushrooming of regulations, policymakers may naturally drift towards more regulation, even if it is sub-optimal for the economy. While analyzing the principal-agent problem, Holstorm & Milgrom (1979) argue that multi-dimensional tasks are ubiquitous in the world and agents have to divide their time among various duties. In such cases, agents choose the tasks whose outcomes are measurable. For instance, if there is an incentive pay for teachers based on their students' test scores, then teachers will focus on the narrowly defined basic skills that are tested on standardised tests and not on the various aspects of student learning. In effect, they will focus on what can be effectively measured. Similarly, as regulation can be easily measured while supervision cannot be measured easily, regulators and decision-makers would prefer to substitute supervision with more and more regulation. After all, regulations provide criteria or checklists, making it easier for regulators to follow and reduce their accountability later on. On the other hand, it is difficult to quantify the amount and quality of supervision. Naturally, policymakers by default tend to favour prescriptive regulation. This creates a perverse incentive to keep adding more top-down regulations regardless of their effectiveness. The following section discusses this in detail.

### (a) More regulation is added over time regardless of its effectiveness

6.16 Since regulation is a more mechanical, top-down approach, it often becomes the default response of policymakers. This has promoted the culture of '*regulate first, ask question later*.' (Australian Government taskforce report, 2006)

6.17 Several such examples abound in India. The Commerce Ministry's Report of the High-Level Advisory Group (2019) noted a maze of complex and stringent regulations to stop 'round-tripping' of funds. The report highlighted that '*the baggage of round-tripping cannot be used to stifle the financial services sector any more than using the risk of a traffic accident to stop construction of a key highway'*. Another example is the unintended consequences of ever-increasing bank regulations which has led to shifting of market activity to "shadow banks" (also called "non-bank financial intermediaries") where the scope for regulatory arbitrage is higher, especially as banks become more averse to lend to high-risk borrowers and/ or small borrowers. Increasing regulation in one part of the financial system has shifted risk to the less-regulated, less- transparent part of the financial system (Sanyal, 2020).

**(b) Discretion is not provided or exercised even when there is a case to do so**

6.18 Since regulations are defined, they are easy to measure ex-ante. Bureaucracies will naturally tend to substitute supervision with mechanical regulations and will not exercise discretion even when it is available.

6.19 As an illustration, take the case of public procurement. As per the General Financial Rules (GFRs) guidelines, the Lowest Cost Method, or commonly known as 'L1' principle is the most prevalent bidding method used for Goods/Works and Non-Consultancy services.

6.20 There is a general agreement that solely relying on L1 does not work well and various organisations have advocated the need for reforming the current procurement system over the last few years. Central Vigilance Commission in its concept note 'Alternative Procurement Strategy for Award of Works and Goods Contract' noted that although L1 may still hold good for procurement of routine works, goods and non-consulting services; but not for high impact and technologically complex procurements. Quality Council of India (QCI) conducted a study[6] on highway development sector and found that the vendors who were all awarded contracts on the basis of competitive bidding vary widely in terms of quality of work and performance which was not covered under existing bid evaluation system. The report suggested incorporating Performance Rating in Competitive Bidding to provide a quality premium to superior bidder rather than simply awarding the contract to L1 bidder and gave a formula to calculate total score as the summation of financial score and performance rating score. NITI Aayog in the concept paper 'Indian Public Procurement: Alternative Strategies and Way Forward' argue that L1 is not suitable in all the scenarios and came up with a variety of alternatives to use in the procurement process. In fact, the report also mentions that new procurement frameworks of multilaterals like World Bank, Asian Development Bank, Japan International Cooperation Agency have suitable alternative strategies for selecting bidders pointing towards needs for change and reforms in current times. They have moved from 'one size fits all' to 'fit to purpose' approach and incorporated various alternatives such as Value for Money, Rated Criteria to consider non-price attributes etc in the procurement methods.

6.21 Despite so many organizations recommending a need for allowing more discretion in the bidding process on account of technical and quality based parameters, we still mostly use L1. The L1 system persists because of the regulatory default problem. No decision maker wants to exercise discretion for the fear of future questioning. This criteria may appear simple and quantifiable, however, in a complex world where it may not be possible to define everything in the pre-procurement process, it is advisable to leave some discretion in the hands of administrators along with maintaining enough transparency and active supervision.

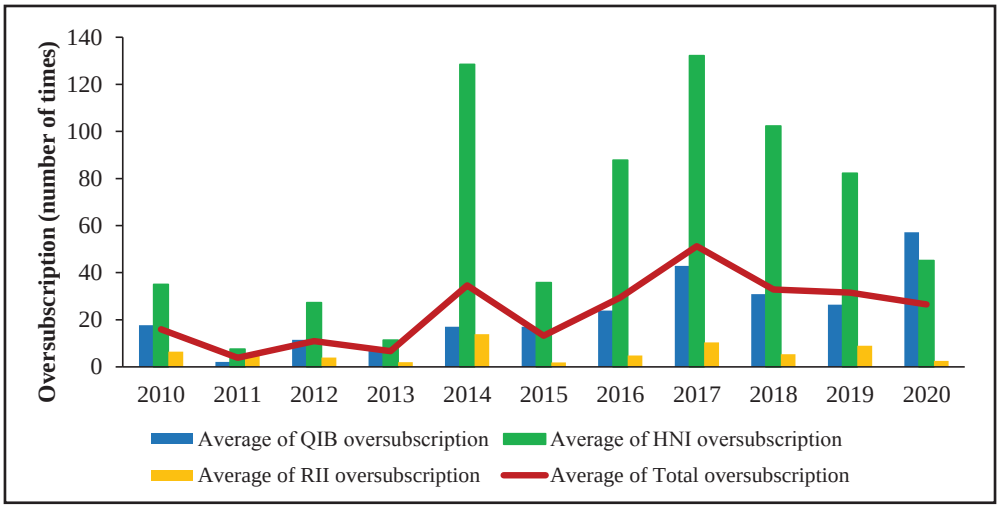
**(c) Discretion is questioned with the benefit of hindsight**

6.22 Discretion exercised ex-ante in the Initial Public Offering (IPO) of publicly listed companies often gets questioned with the benefit of hindsight when the IPO is oversubscribed and/or the first day gain is large. However, the market value of an unlisted entity is unknown. Even after employing the best of valuation techniques, effort, and resources, the actual value of an entity is uncertain until it is traded in the market. It is not uncommon to see stocks being

[6]QCI conducted a pilot study as a part of World Bank Technical Assessment with Ministry of Road Transport & Highways (MoRTH) to rate National Highway projects

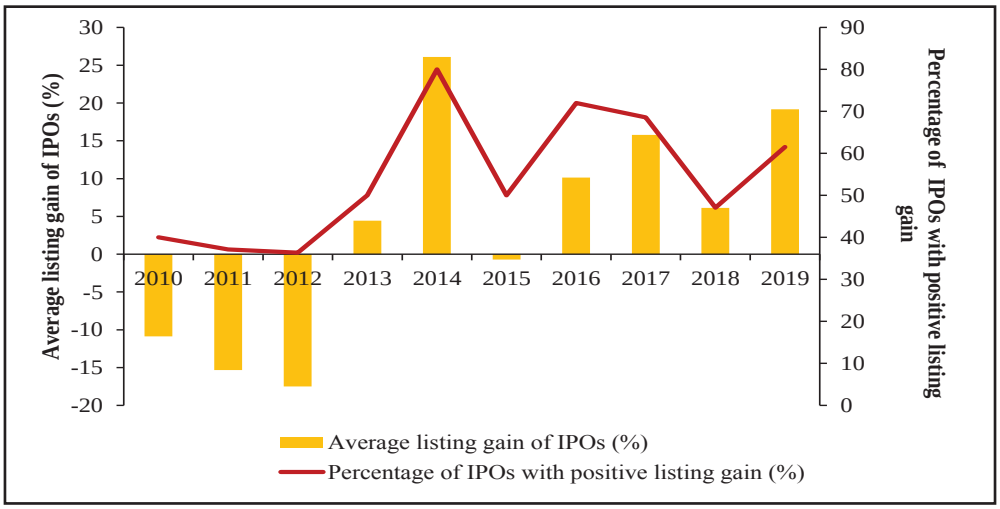
over-subscribed (or under-subscribed) and their prices move up (or down). As Figures 5 and 6 show, oversubscription and first-day gains for IPOs in the private sector are quite significant for many years; at the same time, reflecting the uncertainty involved in predicting the listing price, losses are large too in some years. Figure 5 shows the number of times Indian IPO stocks listed on BSE and NSE between 2010-2020 were oversubscribed by different class of investors. In the last 5 years, average total subscription has been 20-40 times for these IPOs though it has been lower in previous years. Figure 6 shows that most private sector IPOs in the last 7-8 years have had positive listing gains though losses have been large too in previous years. Even in 2019, nearly 60 per cent IPOs had positive listing gains. Table 6 lists the information on some specific stocks to buttress this point that the expected listing price and the amount of subscription is quite uncertain *apriori*.

**Figure 5: Oversubscription of Indian IPOs listed on BSE and NSE (2010-20)**




Source: BSE and NSE. Note: All Indian IPO stocks listed after 2007 are covered. QIB: Qualified Institutional Buyer; NII: High Net-Worth Individual Investor; RII: Retail Individual Investor; Total Oversubscription: Number of Times Issue is Subscribed (BSE + NSE)

**Figure 6: Listing Gains of Indian IPOs listed on BSE and NSE (2010-19)**




Source: BSE and NSE. Note: All Indian IPO stocks listed after 2007 are covered.

**Table 4: Opening and closing prices of stocks listed on the market**

| Company | Date of Listing | Subscription (No of Times) | IPO Price (Rs) | Close Price (Rs) | Return (%) |
|---|---|---|---|---|---|
| Burger King India | 2 Dec 2020 | 1.84 | 60 | 138.4 | 131 |
| SBI Card | 5 March 2020 | 26.5 | 755 | 730 | -4 |
| Ujjivan FSB | 12 Dec 2019 | 166 | 37 | 58 | 56.76 |
| CBS Bank | 4 Dec 2019 | 87 | 195 | 274.25 | 40.64 |
| IRCTC | 3 Oct 2019 | 112 | 320 | 874 | 173 |
| Sterling & Wilson Solar | 6 August 2019 | 0.85 | 780 | 273.1 | -65 |
| Affle (India) | 31 July 2019 | 86 | 745 | 1470 | 97.3 |
| India Mart InterMesh | 26 June 2019 | 36 | 973 | 2131 | 119 |
| Neogen Chem | 26 April 2019 | 41 | 215 | 358 | 66.5 |
| Polycab India | 9 April 2019 | 52 | 538 | 1016.2 | 88.88 |
| Metropolis Healthcare | 6 April 2019 | 6 | 880 | 1350 | 53.41 |

Source: BSE
Note: Close Price on first day of listing

6.23 In cases when government entities go public and the prices go up after the stocks are listed on the market, it is realised that the assets were worth a lot more. Commentators then with 'Hindsight Bias' remark that the assets were sold too cheap. However, it is only after the prices are listed and stocks are traded in secondary market, the actual valuation is known. It is important to note that this is not unique to the public sector undertakings but happens in the private sector as well. Not only are various IPOs over-subscribed but the close price on the day of listing is significantly different from the IPO price (Table 4).

**(d) Government departments follow default precedent**

6.24 Government departments take actions either to tick off boxes in checklist of regulation or follow the default precedent. Thus we see routine appeals made by the government departments against unfavourable judgements in higher courts or tribunals in order to reduce any questioning later on.

6.25 In India, there is a multi-layered system of resolving any dispute in tax-related matters. After scrutiny, the Department or assesses have the option of approaching the Commissioner of Income Tax-Appeals (CIT-A), the Income Tax Appellate Tribunals (ITAT), the High Courts (HC) and finally the Supreme Court of India (SC) in case of disputes in Direct Taxes. As per calculations in Economic Survey 2017-18, Department's appeals constitute nearly 85 per cent of the total number of appeals filed in the case of direct taxes. Of the total number of direct tax cases pending by the quarter ending March 2017, the Department initiated close to 88 per cent of the litigation at ITATs and the Supreme Court and 83 per cent of the litigation pending at High Courts. However, the department loses 73 per cent of its cases in Supreme Court and ITAT and 87 per cent in High Court (Table 5). Even though the success rate of litigation that the government enters in is very low, there is a tendency among the policymakers to appeal to the higher authority.

**Table 5: Petition rate and Success rate of the direct taxes (in per cent)**

| Court/ Tribunal | Petition rate | Success Rate |
|---|---|---|
| Supreme Court | 87 | 27 |
| High Court | 83 | 13 |
| ITAT | 88* | 27 |

Source: Economic Survey 2017-18 calculations
Note: *Provisonal Estimates

## SOLVING FOR DISCRETION

6.26 From the above discussion, it should be clear that there is no substitute for active supervision and discretion. Specifically, *ex-ante* regulation cannot substitute for *ex-post* supervision; in fact, more *ex-ante* regulation only serves to dilute the quality of *ex-post* supervision by fostering opaque discretion. So, how can supervisors be kept accountable while giving them discretion? We explore three possible ways:

### (a) Strengthen *ex-ante* accountability

6.27 The property rights literature based on incomplete contracts argues for the strengthening of governance in institutions by vesting more power in boards and then holding them accountable ex-ante. Instead of relying too much on *ex-post* audits, which anyway suffer from hindsight bias, *ex-ante* accountability needs to be entrusted with the boards of institutions. In most common law countries, there is a case law derived doctrine of Buisness Judgment Rule. The rule states that boards are presumed to act in good faith and protects companies from frivolous lawsuits by assuming that, unless proved otherwise, management is acting in the interests of shareholders. It exists in India as well, however not exactly codified in the same language. But there is a great deal of apprehension that it is not taken into account in audits and post-facto investigations.

### (b) Bring transparency in the decision-making process

6.28 The second way towards effective supervision is to incorporate transparency into the decision-making process. Transparency, apart from having intrinsic value, is appreciated because it promotes trust in public institutions and makes market efficient. The discretion in the system needs to be balanced with the transparency in decision making.

6.29 The benefits of transparency can be seen from the recent reform in public procurement. The Government in 2016 had set up a dedicated e-market known as Government e Marketplace (GeM) for different goods & services procured or sold by Government/PSUs. Anecdotal evidence suggests that prior to GeM, government procurement prices were much higher than the prices prevailing in the market and there were constant complaints about inefficiency and rent seeking. As the GeM website mentions, use of this e-marketplace has resulted in a substantial reduction in prices in comparison to the tender, rate contract and direct purchase rates that were used previously. The average prices on GeM are lower by atleast 15-20 per cent than previously, and in some cases even upto 56 per cent.

6.30 A comparison of prices of various commodities on GeM portal with those of company websites and online platforms such as Amazon, Flipkart, etc is given in the table below (Table 6). For the study (done on January 4, 2021), a set of common items were identified. Effort was made to ensure that the products matched as closely as possible. The study found the prices to be in the same ballpark. On on average, the variation between the prices on GeM and other online market places is only around 3 per cent. Being an open platform alert citizens can continue to monitor it real time.

**Table 6: GEM Portal Prices Comparison (as on 04-01-2021)**

| Name and Description (specs, model, features) | Price on GEM (in Rupees) | Price at Amazon, Official Website etc. (in Rupees) | Variation in Offer Price |
|---|---|---|---|
| Parker Jotter Standard Ball Pen | MRP: 250; Offer Price (OP): 210 | Amazon.in- MRP: 250; OP: 188 | + 10.5% |
| Rorito Greetz Gel Pen Maxtron Gold Robotic Fluid Ink System Pen -Blue | MRP: 99; OP:87.95 | Amazon- MRP: 99; OP: 64 | + 27.2% |
| Haier 1.5 Ton / 4500 kcal/hr High wall Split AC 5 Star Model:HSU19C-TFW5B(INV) | MRP: 65,000; OP: 58,500 Warranty: 2 year (Product), 10 year (compressor) | Amazon.in-MRP: 55,000; OP: 36,990 Warranty- 1 year (product); 12 years (compressor) Haier Website-Price: 42,990 | + 36.8% |
| Samsung 108 cm (43 inches) 4K Ultra HD Smart LED TV, Model: QA43Q60TAKXXL Resolution: 3840x2160 | MRP: 78,900, OP: 70,998 Warranty- 1 Year | Amazon.in- MRP: 78,900, OP: 62,990 Warranty: 1 year comprehensive and 1-year additional warranty on Panel by Samsung | + 11.3% |
| Omron White HEM 7156 Blood Pressure Monitor | MRP: 3,860, OP: 3,100 Warranty – 2 years | 1mg.com- MRP: 3,860, OP: 2,860, Warranty – 3 years | + 7.7% |
| HP LaserJet ENTERPRISE M607N Black and White Print Speed: >= 51 ppm | MRP: 1,22,921 OP: 1,10,625 Warranty – 3 Years | HP Website- MRP: 1,03,661 OP: 98,440 Warranty- 1 Year | + 11.01% |
| Kores Easy Cut 871 Paper Shredder | MRP: 25,490, OP: 22,900 | Amazon.in- MRP: 23,990 OP: 19,589 | + 14.5% |
| Hero Stainless Steel Bicycle for Men Model Name: Hero Lectro C3i 26 SS | MRP: 47,999 OP: 42,997 | Hero Lectro (Choosemy bicyle.com) OP: 32,499 Croma: MRP: 32,999, OP:32,990 | (Gem vs Croma) + 23.3% |

| Name and Description (specs, model, features) | Price on GEM (in Rupees) | Price at Amazon, Official Website etc. (in Rupees) | Variation in Offer Price |
|---|---|---|---|
| Milton 1500ml thermos | MRP: 1,560, OP: 1,100 | Amazon: MRP: 1,454 OP: 1,199 | - 9% |
| Nilkamal Dustbin 60 Litres | MRP: 3,100, OP: 1,175 | Amazon- MRP: 1,990 OP: 1,448 | - 23.2% |
| Nilkamal Veneto High Back Office Chair | MRP: 17,500, OP: 14,000 | Nilkamal Website- MRP: 13,500, OP: 11,297.00 | + 19.3% |
| Bajaj Pulsar NS200 Motor Cycle | MRP: 1,15,250 OP: 1,15,250 | Bajaj Auto website- MRP: 1,31,219 (Ex-showroom price in New Delhi) | - 13.9% |
| Godrej Interio Elite Mid Back Chair | MRP: 12,390, OP: 11,150 | Godrej Interio website- MRP: 12,390 | - 11.1% |
| Godrej Interio Steel Almirah 2400 mm (Slide N Store Compact Plus Wardrobe) | MRP: 31, 022, OP: 27,919 | Godrej Interio website- MRP: 32,572 | - 16.7% |
| Godrej Interio Orlando 2-Seater Sofa | MRP: 51,800, OP: 46,620 Warranty- 1 year | Godrej Interio Website- MRP: 51,799, Warranty- 3 years | - 9.99% |
| Godrej Interio blue Zephyr Leisure Chair | MRP: 21,024, OP: 18,921 | Godrej Interio Website- MRP: 21,022 | - 11.1% |
| Honda Activa 6G DLX BS-VI Vehicle Engine Capacity (cc) 109.51 | MRP: 60,767 OP: 60,767 | Bikewale.com MRP:68,930 (Ex Showroom price) | - 13.4% |
| Apple MacBook Pro 16 inches 1TB MVVM2HN/A, 16 GB RAM, 1 TB SSD, 4 GB Graphics Card | MRP: 2,73,800 OP: 2,45,679 | Vijay Sales- MRP: 2,39,900, OP: 2,34,900 Tata Cliq- MRP: 2,39,900, OP: 2,27,900 | (GEM vs Tata Cliq) + 7.2% |
| Dell Intel Core Desktop PC Monitor - E2720H Processor- i9 10900, RAM- 32 GB (DDR4) Expandable upto 128GB, HDD- 1000 GB HDD, SSD- 1024 GB, OS- Windows 10 Professional Graphics Card- 8 GB; NVIDIAGeForceRTX2070 | MRP: 2,23,001 OP: 1,97,998 Warranty – 3 years | Dell Website (Desktop assembled with same specs)- 2,06,873 (Warranty: 3 year) | - 4.5% |

Source: GeM website, Amazon, Flipkart, various companies website
Note: Prices as on January 4, 2020, OP: Offer Price, MRP: Maximum Retail Price
Variation is calculated as the percentage difference in GeM prices over the comparable prices

### (c) Build resilient *ex-post* resolution mechanism

6.31 When outcomes are uncertain, it is important to have a resilient ex-post resolution mechanism. Despite having all regulations in place and best efforts to deal with effective supervision *ex-ante,* devising a robust *ex-post* resolution mechanism is imperative. Grossman and Hart's (1986) work on "incomplete contracts" demonstrates that the contracts are contingent on future states and it is not possible to write complete contracts, and by extension regulations, for every future state. Thus, adding *ex-ante* complexity to contracts and regulations, or risk analysis cannot resolve this issue.

6.32 Hence, there is a need for efficient legal systems (i.e., courts and institutions) such as Insolvency and Bankruptcy Code (IBC), Debt Recovery Tribunals etc. However, the court system remains the single most important way for *ex-post* resolution. The performance in the area of dispute resolution and contract enforcement in India remains a concern and needs to be focused on. As per the World Bank' Ease of Doing Buisness report (2020), it takes 1445 days to resolve a commercial contract in India as compared to 589.6 days in OECD high income countries and 120 days in Singapore. The report also shows that the cost of litigation in India is around 31 per cent of the claim value. This is significantly higher than in OECD countries (21 per cent) and Bhutan (0.1 per cent). The performance of India is enforcement of contracts is also seen in its ranking in World Rule of Law Index for 2020, where India ranks 69 out of 128 countries. Our performance is the worst in the category 'Civil Justice not subject to unreasonable delay' where we are placed at rank 123 falling just behind Venezuela, Guatemala, Peru, Bangladesh and Columbia (Table 7).

**Table 7: India's rank in the World Rule of Law Index (2020)**

| Particulars | India Rank out of 128 |
|---|---|
| **World Rule of Law Index** | 69 |
| People can Access and Afford Civil Justice | 115 |
| Civil Justice is not subject to unreasonable delay[7] | 123 |
| Civil Justice is effectively enforced | 102 |
| Alternative dispute resolution mechanism is accessible | 88 |

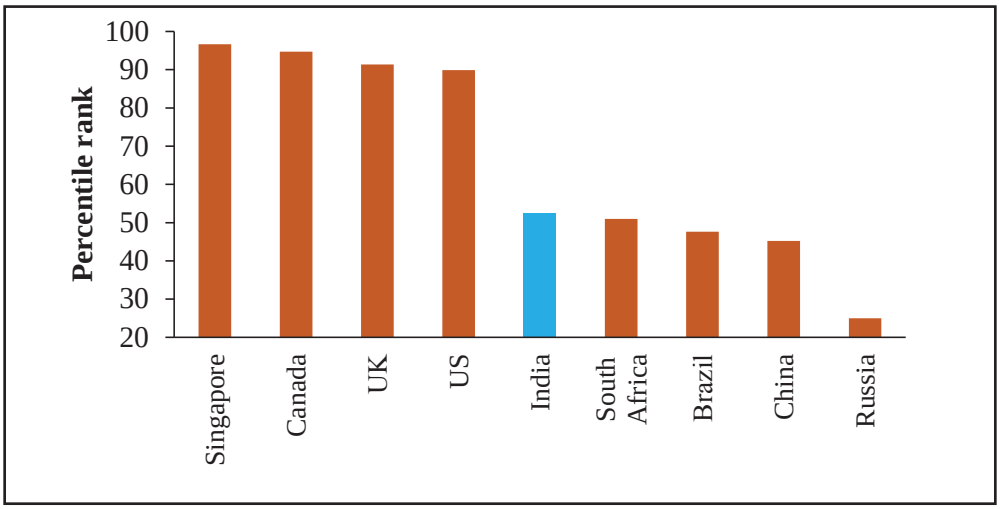
Source: World Justice Project (2020)

6.33 The "Rule of Law[8]" indicator of the World Governance Index reiterates the same story. India is lagging behind with score '0' as compared to 1.6 and 1.5 in the UK and US respectively (Figure 7). All these points towards the need for reforming the legal structure to have an efficient *ex-post* mechanism for dispute resolution and contract enforcement in India.

[7]It measures whether civil justice proceedings are conducted and judgements are produced in a timely manner without delay.

[8]Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate ranges from approximately -2.5 to 2.5.

**Figure 7: Cross country comparison of Rule of Law indicator**




Source: World Bank

6.34 The legal system is required not to fix *ex-ante* issues in the system but to be used as an *ex-post* dispute resolution mechanism. This is just as true for government decision makers who may find their decisions questioned later. An effective enforcement system should be able to distinguish the negative outcomes arising due to uncertainties from outright frauds. There is a need for reforms in the legal system in the country as as been argued by various Economic Surveys in the past.

## DIRECTION OF ADMINISTRATIVE PROCESS REFORMS

6.35 The above approach has several implications that are already informing recent reforms. Here are two recent examples:

- Labour falls under the Concurrent List of the Constitution, therefore both Parliament and state legislatures can make laws regulating labour. There were over 100 state and 40 central laws regulating various aspects of labour such as the resolution of industrial disputes, working conditions, social security and wages, making the landscape of labour regulation very complex. To rectify this, Government merged the existing 29 central labour laws into 4 labour codes. The Code on wages was passed in July 2019. In Setember 2020, three bills (i) Industrial Relations Code, 2020, (ii) Code on Occupational Safety, Health & Working Conditions Bill, 2020 (iii) Social Security Code, 2020 were passed in the parliament.
- The regulatory framework for Other Service Providers (OSP) was till recently, outdated and complex. For instance, the Business Process Outsourcing (BPO) industry increasingly runs on global cloud-based systems but Indian regulations restricted its use and insisted on a local EPABX. Further, there were restrictions on Work from Home and onerous registration requirements. Hence, to reduce the compliance burden of the BPO industry, government announced new guidelines on OSPs on 5$^{th}$ November 2020. Under the new regulations, the registration requirement for OSPs has been done away with altogether and the BPO industry engaged in data-related work has been taken out of the ambit of OSP regulations.

Similarly, several other requirements, which prevented companies from adopting 'Work from Home' and 'Work from Anywhere' policies have also been removed. This has significantly liberalized the regulation for the BPO sector. (See the details in Chapter No 9 of Volume 2)

6.36 The need for process simplicity extends to the institutional architecture as well. The ultimate source of supervision is public scrutinty and public leadership. Since it is not possible for the public to scrutinize everything, the focus should be on a strong but limited state, rather than weak and all pervasive state. This is in line with government's idea of 'Minimum Government and Maximum Governnance'. Since Independence, a plethora of autonomous bodies had proliferated. There is a need to prune them consistently not just from a cost perspective but in order to maintain transparency, accountability and efficient supervision. In this spirit, in the last year several organizations including All India Handloom Board, All India Handicrafts Board, Cotton Advisory Board and Jute Advisory Board have been closed. Similarly, the governement approved merger of four of its film media units, namely Films Division, Directorate of Film Festivals, National Film Archives of India, and Children's Film Society, India into the National Film Development Corporation (NFDC) Ltd.

6.37 Finally, there is a case for enacting Transparency of Rules Act to end any asymmetry of information regarding rules and regulations faced by a citizen. This was initially proposed in Chapter 8 of Economic Survey 2016-17 Volume 2. The reform solves for the problem that rules frequently change and often the citizen has to follow a long paper trail of circulars and notifications to know the current requirements. Under this act, all departments will need to mandatorily place all citizen-facing rules on their website. Officials will not be able to impose any rule not explicitly mentioned on the website clearly. Further, all laws, rules and regulations will have to be presented as an updated, unified whole at all times. This will bring transparency and simplify the understanding of regulations.

## CHAPTER AT A GLANCE

- It is not possible to have complete regulations in a world which has uncertainty as it is not possible to account for all possible outcomes. The evidence, however, shows that India over-regulates the economy. This results in regulations being ineffective even with relatively good compliance with process.
- This chapter argues that the root cause of the problem of over-regulation is an approach that attempts to account for every possible outcome. This is illustrated by a study of the time and procedures needed to voluntarily close a company in India, even when there is no outstanding dispute or litigation.
- Both economic theory and evidence shows that in an uncertain and complex world, it is not possible to write regulations that account for all possible outcomes. This makes discretion unavoidable in decision-making. The attempt to reduce discretion by having ever more complex regulations, however, results in even more non-transparent discretion. The solution is to simplify regulations and invest in greater supervision which, by definition, implies willingness to allow some discretion.

- Discretion, however, needs to be balanced with transparency, systems of *ex-ante* accountability and *ex-post* resolution mechanisms. The experience with GeM portal for public procurement illustrates how transparency not only reduces purchase prices but also provides the honest decision maker with a clean process.

- The above intellectual framwework has already informed reforms ranging from labour codes to removal of onerous regulations on the BPO sector. The same approach is also reflected in the rationalisation of autonomous bodies.

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# Regulatory Forbearance: An Emergency Medicine, Not Staple Diet!

**07**
**CHAPTER**

**"Those who do not learn from history are condemned to repeat it."**

— George Santayana, Spanish philosopher

*The current regulatory forbearance on bank loans has been necessitated by the Covid pandemic. This chapter studies the policy of regulatory forbearance adopted following the 2008 Global Financial Crisis (GFC) to extract important lessons for the current times. Regulatory forbearance for banks involved relaxing the norms for restructuring assets, where restructured assets were no longer required to be classified as Non-Performing Assets (NPAs henceforth) and therefore did not require the levels of provisioning that NPAs attract. During the GFC, forbearance helped borrowers tide over temporary hardship caused due to the crisis and helped prevent a large contagion. However, the forbearance continued for seven years though it should have been discontinued in 2011, when GDP, exports, IIP and credit growth had all recovered significantly. Yet, the forbearance continued long after the economic recovery, resulting in unintended and detrimental consequences for banks, firms, and the economy. Given relaxed provisioning requirements, banks exploited the forbearance window to restructure loans even for unviable entities, thereby window-dressing their books. The inflated profits were then used by banks to pay increased dividends to shareholders, including the government in the case of public sector banks. As a result, banks became severely undercapitalized. Undercapitalization distorted banks' incentives and fostered risky lending practices, including lending to zombies. As a result of the distorted incentives, banks misallocated credit, thereby damaging the quality of investment in the economy. Firms benefitting from the banks' largesse also invested in unviable projects. In a regime of injudicious credit supply and lax monitoring, a borrowing firm's management's ability to obtain credit strengthened its influence within the firm, leading to deterioration in firm governance. The quality of firms' boards declined. Subsequently, misappropriation of resources increased, and the firm performance deteriorated. By the time forbearance ended in 2015, restructuring had increased seven times while NPAs almost doubled when compared to the pre-forbearance levels. Concerned that the actual situation might be worse than reflected on the banks' books, RBI initiated an Asset Quality Review to clean up bank balance sheets. While gross NPAs increased from 4.3% in 2014-15 to 7.5% in 2015-16 and peaked at 11.2% in 2017-18, the AQR could not bring out all the hidden bad assets in the bank books and led to an under-estimation of the capital requirements. This led to a second round of lending distortions, thereby exacerbating an already grave situation.*

*The prolonged forbearance policies following the GFC thus engendered the recent banking crisis that brought down investment rates and thereby economic growth in the country. The first lesson for policymakers is to treat emergency measures as such and not to extend them even after recovery: when an emergency medicine becomes a staple diet, it can be counterproductive. Second, while the learnings from the previous episode must be employed to avoid a recurrence, ex-post analysis of complex phenomena must be disciplined by the insights highlighted in Chapter 7 of the Survey. Specifically, to enable policymaking that involves an exercise of judgement amidst uncertainty, ex-post inquests must recognise the role of hindsight bias and not make the mistake of equating unfavourable outcomes to either bad judgement, or worse, malafide intent.*

## INTRODUCTION

7.1 To address the economic challenges posed by the Covid-19 pandemic, financial regulators across the world have adopted regulatory forbearance. India is no exception. Emergency measures such as forbearance prevent spillover of the failures in the financial sector to the real sector, thereby avoiding a deepening of the crisis. Therefore, as emergency medicine, forbearance occupies a legitimate place in a policy maker's toolkit; see Box 1 for an explanation of the economic rationale for forbearance. However, caution must be exercised so that emergency medicine does not become a staple diet because borrowers and banks can easily get addicted to such palliatives. When emergency medicine becomes a staple diet, the negative side effects may not only be large but may also last for a while. Therefore, carefully examining and understanding the implications of previous forbearance episodes is relevant to guide future policy. In 2008, anticipating the global financial crisis, RBI introduced the policy of regulatory forbearance. It relaxed the norms for restructuring stressed assets - downgrading the asset to non-performing status was no longer mandatory and required no additional provisioning; see Box 2 for the description and timeline of the same. This chapter studies the impact of the 2008 forbearance policy on banks, firms, and the economy in general to glean important lessons for the current times. As Spanish philosopher George Santayana cautioned, "Those who do not learn from history are condemned to repeat it."

### Box 1: Economic Rationale for Forbearance

The following illustration describes banks' choices while dealing with a stressed asset with and without forbearance. In this context, we must keep in mind that when a bank creates additional provisions to account for loan losses, the bank's profits decline and thereby lead to a reduction in the bank's equity capital. Therefore, the incentives to provision for bad loans gets significantly impacted by regulatory forbearance.

| Without Forbearance | With Forbearance |
|---|---|
| 1. If the project is viable, the bank would restructure the asset and downgrade it to a Non-Performing Asset (NPA) and provision for the same. | 1. If the project is viable, the bank would restructure the asset. As restructured assets do not require the same level of provisioning as NPAs, inadequate provisions are made. |

| | |
|---|---|
| 2. If the project is unviable, the bank would not restructure the loan and declare the asset as non-performing. Crucially, banks do not gain by restructuring unviable projects in this case. | 2. Capital-starved banks now have an incentive to restructure even unviable projects to reduce provisioning and avoid the consequent hit on capital. |

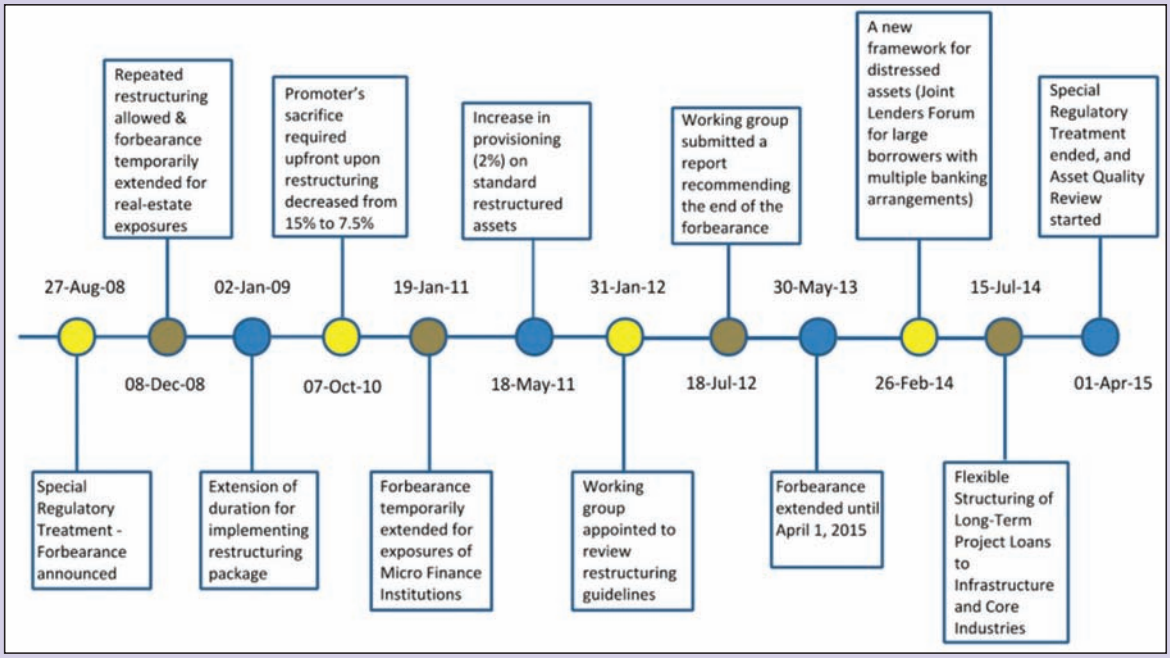
Absent forbearance, a bank must decide to restructure based on the viability of the firm/project because the cost of restructuring an unviable firm is significant. But, with forbearance, banks do not suffer any near-term cost from restructuring. Therefore, banks prefer restructuring, as this choice allows them to declare fewer NPAs and avoid the costs due to loan provisioning. Forbearance thus incentivizes banks to take risks by restructuring stressed assets even if they are unviable. Capital-constrained entities are particularly susceptible to investing in risky projects, a phenomenon called risk-shifting in academic literature (Jensen and Meckling, 1976). Consider the case where a bank has a large outstanding against a borrower who is on the verge of default. If the borrower defaults, the bank would have to recognize the debt as NPA, incur a loss, and possibly re-capitalize on account of the depleted capital. Given the borrower's solvency concerns, lending a fresh loan, or restructuring its current loan(s) is extremely risky and may result in further losses for the bank. However, in the unlikely case that the fresh credit helps the borrower recover, banks would get back all their debt with interest and therefore face no reduction in capital. Notice that the recognition of loss impacts equity holders. They get no return on their investments and are forced to recapitalize to maintain sufficient capital adequacy. In such a scenario, a capital-starved bank, where equity owners have little "skin in the game", is likely to continue lending to the risky borrower. With low capital, equity owners have little to lose from the fresh lending in the likely scenario where the borrower fails. However, the unlikely case of firm revival would result in a significant upside for them. Depositors do not have any marginal upside in the case of risky investment but may incur some costs if the firm fails. Hence equity owners gain if the risks pay off and if the risks fail the cost would be borne by the depositors, bondholders, and/or the taxpayers. Forbearance further allows equity owners to restructure loans without any additional cost. Capital-constrained banks, therefore, choose to restructure even unviable projects when the opportunity arises under a forbearance regime, thereby shifting risk away from equity holders to depositors and taxpayers.

The above phenomenon of forbearance-induced risk-shifting is apparent in the case of privately held banks where equity owners could act in their own interests. In a few Indian banks, promoters administer management and decision-making, directly or indirectly, by virtue of their controlling shareholding and/or management rights. Given their controlling stake, perverse incentives of promoter-managers in the presence of forbearance are understandable. However, most Indian banks are widely held or controlled by the government, and hence, their incumbent managements do not own sizeable stakes in these institutions. How forbearance distorts banks' incentives in this context, therefore, needs an explanation. The rationale includes two key points. First, guided by their personal career concerns, the incumbent bank managers always have incentives to report strong performances during their tenure. Sarkar, Subramanian, and Tantri, 2019 show that bank CEOs' post-retirement career benefits, such as future corporate board memberships,

are associated with distortionary practices during their tenure. Forbearance provides incumbent managers an opportunity to window-dress their balance sheets, show good performance during their tenure, and thereby enhance post-retirement career benefits. Consequently, bank managers resort to distortionary practices under forbearance. Second, banks' management may use forbearance as a shield to cover up outright corruption and nepotism. The events with the Punjab National Bank or recent allegations of deceit against former bank CEOs corroborate this possibility. Notice that forbearance allows banks to hide bad loans by delaying the recognition of losses. Bank managers, therefore, foresee very little downside in making unviable loans to connected parties, against the upside of making quick personal gains.

## Box 2: Regulatory Forbearance provisions

1. As per regulations prevalent before August 2008, non-industrial non-SME accounts classified as 'standard assets' were to be re-classified as 'sub-standard assets' upon restructuring. The new relaxed norms entitled borrowers to retain the same asset classification upon restructuring, subject to a few conditions.
2. Since accounts would no longer be classified as sub-standard on restructuring, banks were no longer required to make the general provision on total outstanding for substandard assets.
3. The relaxed norms were extended to already restructured loans as well. Note, before 2008, only loans with no prior history of restructuring were considered for restructuring. Below is a timeline of announcements relating to the forbearance regime of 2008-2015:

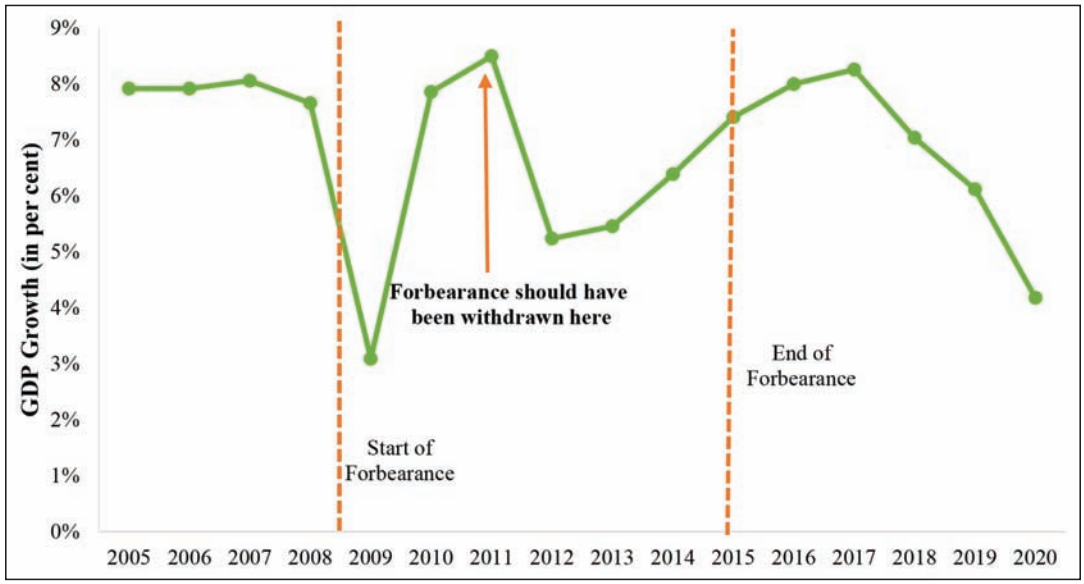



## THE ORIGINAL SIN: THE SEVEN-YEAR FORBEARANCE!

7.2 The forbearance policies had desired short-term economic effects. GDP growth recovered from a low of 3.1% in FY2009 to 8.5% within two years, as shown in Figure 1. There was

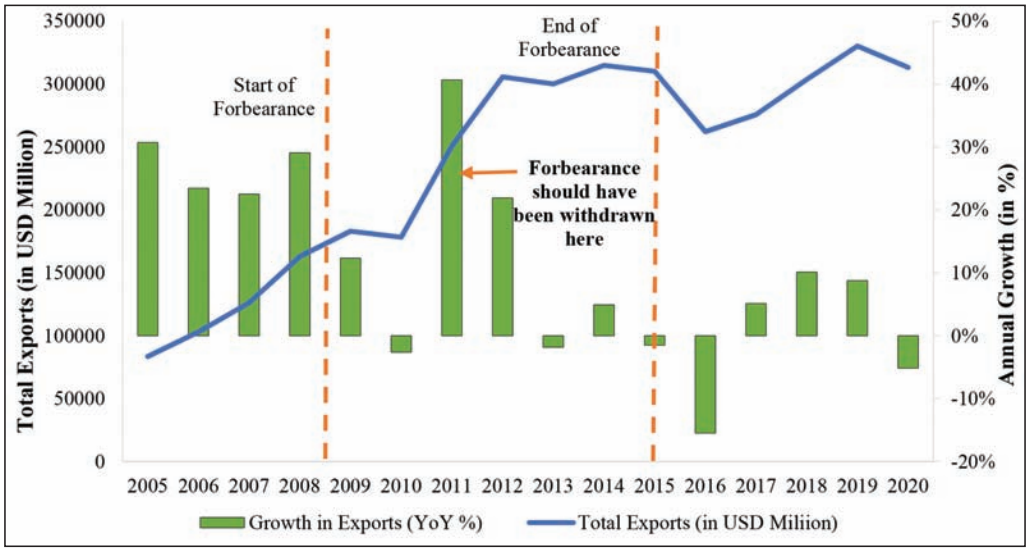
a marked improvement in other economic indicators ranging from exports to the Index of Industrial Production (IIP), as highlighted in Figures 2 and 3. Figure 4 shows that the growth in total revenue of listed firms also recovered from a low of 4.88% during the crisis to a high of over 20% in 2011. As shown in Figure 5, growth in bank credit, which had fallen from 22.3% in FY2008 to 16.9% in FY2010, recovered quickly to 21.5% in FY2011. The time was therefore ripe to withdraw the forbearance; after all the emergency medicine had worked in restoring the health of the economy. However, the central bank decided to continue with the same. As shown in Box 2, the forbearance continued for five more years till 2015, even when its withdrawal was recommended – a clear case of emergency medicine that was chosen to be made into a staple diet.

**Figure 1: Growth rate of Real GDP**



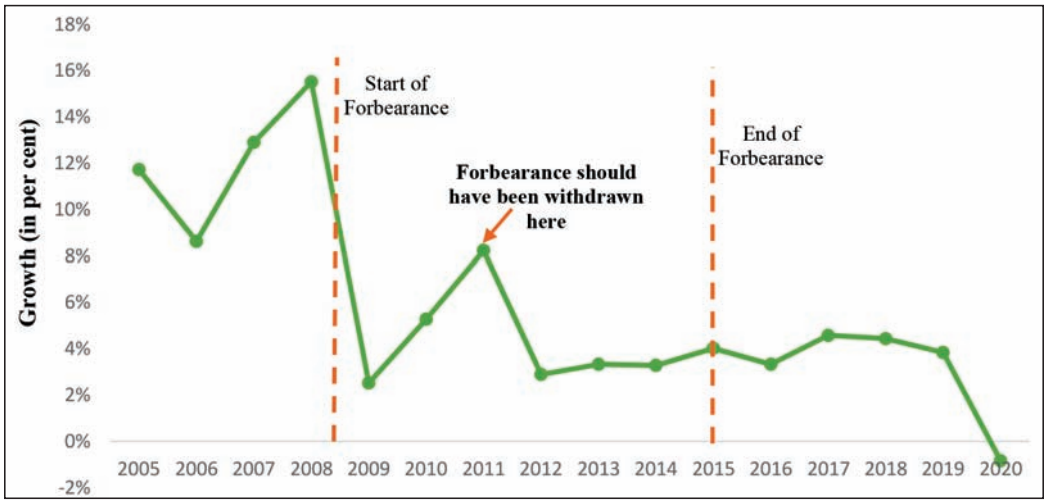

Source: NSO

**Figure 2: Growth in Exports**



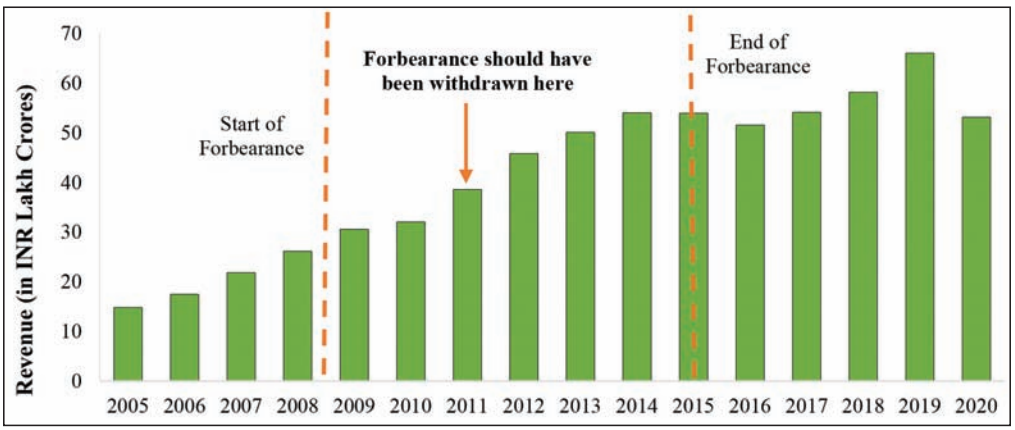

Source: Department of Commerce

**Figure 3: Growth in Industrial Production (IIP)**



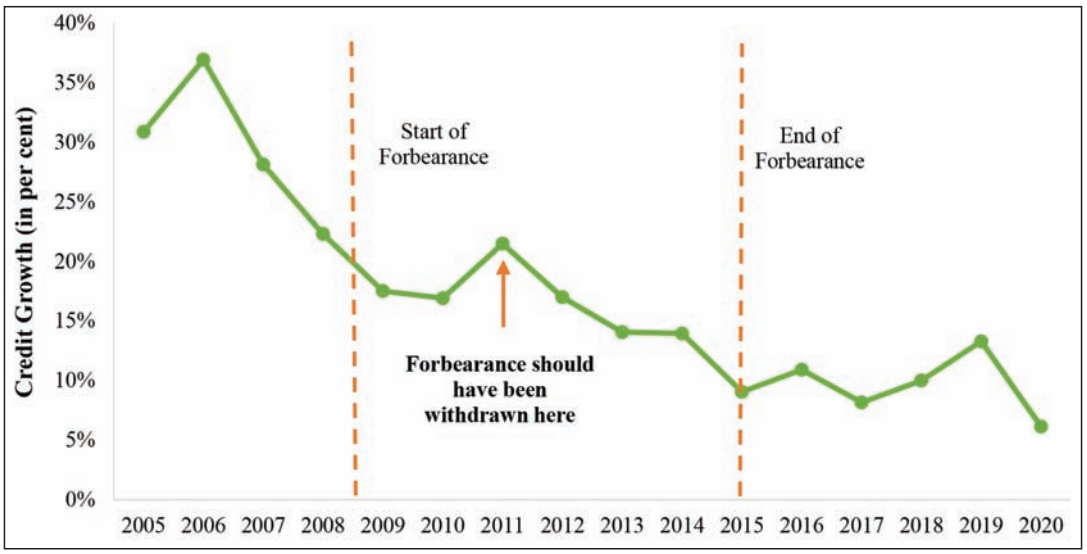

Source: NSO

**Figure 4: Firms Revenues as a proxy for borrowers' health**




Source: Ministry of Corporate Affairs

**Figure 5: Growth in Outstanding Credit of Banks**




Source: RBI Table on Annual Account of SCBs

7.3 During the period of the global financial crisis (GFC), the policy worked well with banks selecting genuinely distressed, but viable in the long-run, borrowers for restructuring. Box 3 explains the careful panel regressions undertaken to control for various confounding factors. The results show that, during the GFC, banks more likely to benefit from forbearance do not differ in their selection of restructuring choices when compared to a bank with a lower likelihood of utilizing forbearance. The propensity to restructure any given borrower, including unviable ones is, however, significantly higher in the years after the crisis. Evidently, once the banks got a signal about the continuation of forbearance despite the economic recovery, several types of distortions crept in. As pointed out earlier, emergency medicine indeed became a staple diet. For instance, figures 6 and 7 show that the proportions of loans restructured increased significantly during this period. The share of restructured loans increased from 0.74% in FY2008 to 6.94% in FY2015, as shown in figure 6. The increase in the share of restructured loans among public sector banks was much higher, from 0.82% to 8.49%. However, the private sector banks also saw their share of restructured loans increase from 0.64% to 2.87%. On the contrary, as shown in figure 8, the reported gross NPAs of banks increased only modestly from 2.2% in FY2008 to 4.3% in FY2015. It appears that the banks used the option of restructuring loans that were on the verge of defaulting without regard to the viability of such loans, as shown subsequently in Section 8.27. During the forbearance window, the proportion of firms in default increased by 51% after their loan(s) got restructured. In the pre-forbearance era, there was only a marginal 6% increase in the likelihood of defaults after restructuring. Forbearance thus helped banks to hide a lot of bad loans.

## Box 3: Difference-in-Difference Framework to Show Distortion in Banks' Incentives

Mannil, Nishesh, and Tantri (2020) use a difference-in-difference methodology to test whether and when forbearance induces lending distortions among banks. This strategy estimates the lending activity by a bank in the counterfactual scenario of forbearance not being available. The difference in the actual lending activity in the presence of forbearance and the one under this counterfactual scenario is therefore a consequence of forbearance.

To this end, banks are classified into two separate groups - B1 and B2, such that the two types of banks are similar in all respects except for their susceptibility to exploiting the forbearance policies. Precisely, banks in B1 have a higher proportion of borrowers that are adversely hit by the crisis. This naturally increases the likelihood of B1, relatively, exploiting the use of regulatory forbearance measures. By a thorough comparison of attributes such as ownership, capital, NPA, and age, Mannil, Nishesh, and Tantri (2020) show that the two categories of banks thus formed are otherwise similar.

Banks in B1, o n average, would have a higher share of loans restructured during the crisis on account of the higher shock faced by their borrowers. Therefore, a comparison of B1 and B2 on aggregate outcomes would not be appropriate to understand the distortions forbearance can induce. Subsequently, Mannil, Nishesh, and Tantri (2020) use a firm-level fixed effects estimate that compares outcomes within a given firm and between the two types of banks. If for the same firm, banks in B1 exhibit a higher restructuring activity during forbearance, it implies that these banks, on average, are relatively less prudent in selecting cases for restructuring and are likely to restructure even unviable projects. Because B1 and B2 are

otherwise similar, any difference in their propensity to restructuring could be attributed to their varying susceptibility to exploiting forbearance. With this strategy for identification of the causal effects, the lending activity of banks over the years 2002-2015 is analyzed. The years are split into three groups: the pre-forbearance period of 2002-2008, the crisis period of 2009-2011, and the post-crisis period of 2011-2015. Organizing the data at a firm-bank-year level, the following regression is estimated:

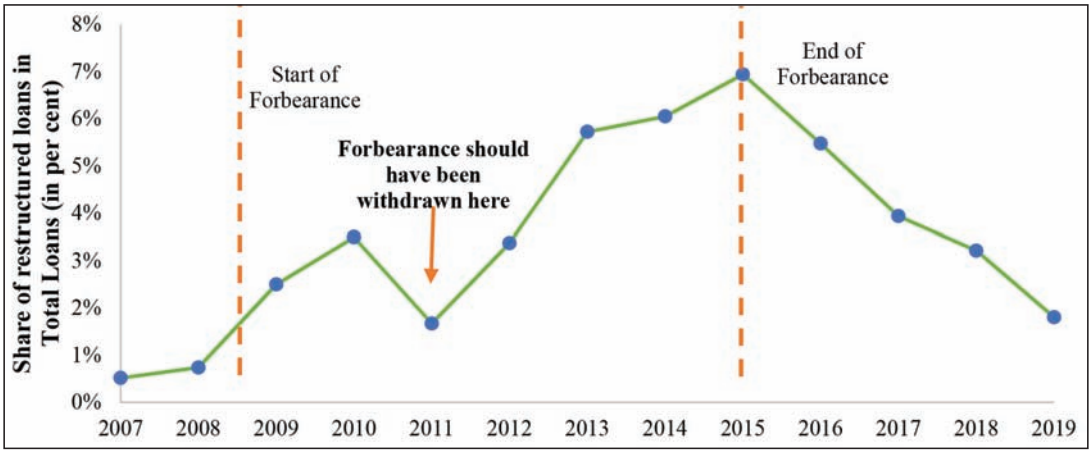
$$Restructured\ Loan\ Amount_{ijt} = \alpha + \beta\_1 \times Treatment_j \times Crisis_t + \beta_2 \times Treatment_j \times PostCrisis_t + \beta_3 \times X_{it} + \delta_{it} + \nu j + \epsilon_{ijt}$$

| | (1) | (2) |
|---|---|---|
| VARIABLES | Restructured Loan Amount (in INR Million) | |
| Treatment X Crisis (2009-2011) | 9.070<br>(12.952) | 10.130<br>(13.675) |
| Treatment X Post-Crisis (2012-2015) | 34.582**<br>(16.735) | 35.952**<br>(17.642) |
| Bank Controls | No | Yes |
| Observations | 237,690 | 237,690 |
| R-squared | 0.183 | 0.183 |
| (Firm, Year) Fixed Effects | Yes | Yes |
| Bank Fixed Effects | Yes | Yes |

Table 1: The table shows the difference-in-difference estimate described in the equation above. Restructured loan amount measures the total amount of loan restructured by the bank j for the borrower i in the year t. Treatment is an indicator variable that takes the value of 1 for banks that have above-median exposure to crisis-hit borrowers and 0 otherwise. Crisis (Post-crisis) is another indicator variable that takes the value of 1 for years 2009 – 2011 (2012 – 2015) and 0 otherwise, included in column 2, refers to the bank-specific time-varying controls, namely the bank's proportion of government ownership, the proportion of foreign institutional ownership, and the CEO tenure. refers to (firm, year) fixed effects which ensure that restructuring activity is compared within a (firm, year).stands for bank fixed effects to absorb any unobserved variations across banks. ** represents a 5% level of statistical significance. Standard errors, clustered at the bank level, are reported in the parenthesis. Source: Mannil, Nishesh, and Tantri (2020).

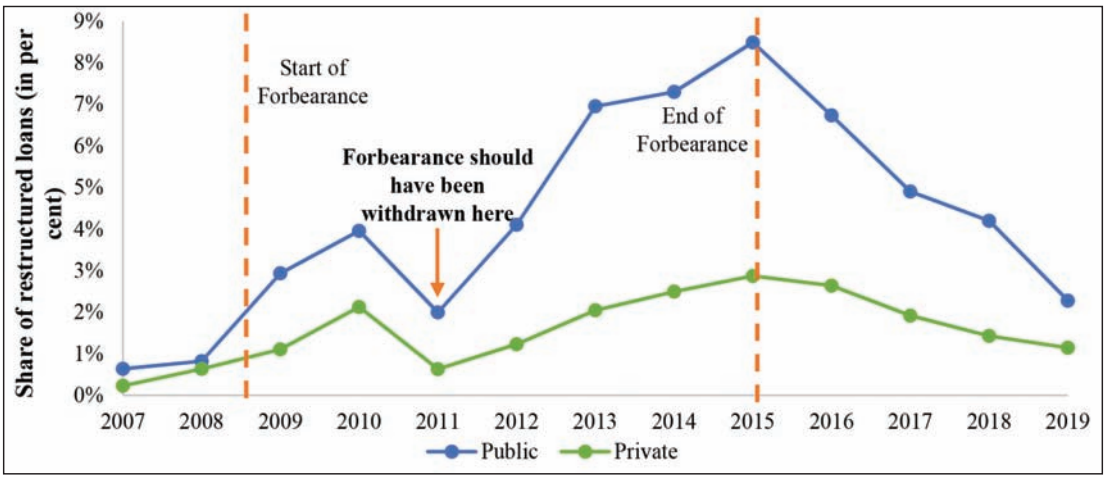
The coefficients denote the average difference in restructuring amount compared to the pre-forbearance period (2002-08), between the two types of banks. The coefficients are statistically indistinguishable from zero during the crisis period (2009-11). This suggests that the restructuring activity by the two types of banks does not differ during the crisis phase. Note that, rather than comparing total restructuring, the framework compares restructuring propensity vis-à-vis a given firm. Hence, there are no signs of distortions during the crisis. The coefficients, however, become positive in the post-crisis period with a statistical significance of 5%. This indicates that banks more likely to utilize forbearance became imprudent in the selection of firms for restructuring after the crisis dissipated. Thus, the prolonged nature of forbearance seems to have distorted banks' incentives only after the end of the crisis.

**Figure 6: Higher Restructuring during Forbearance**



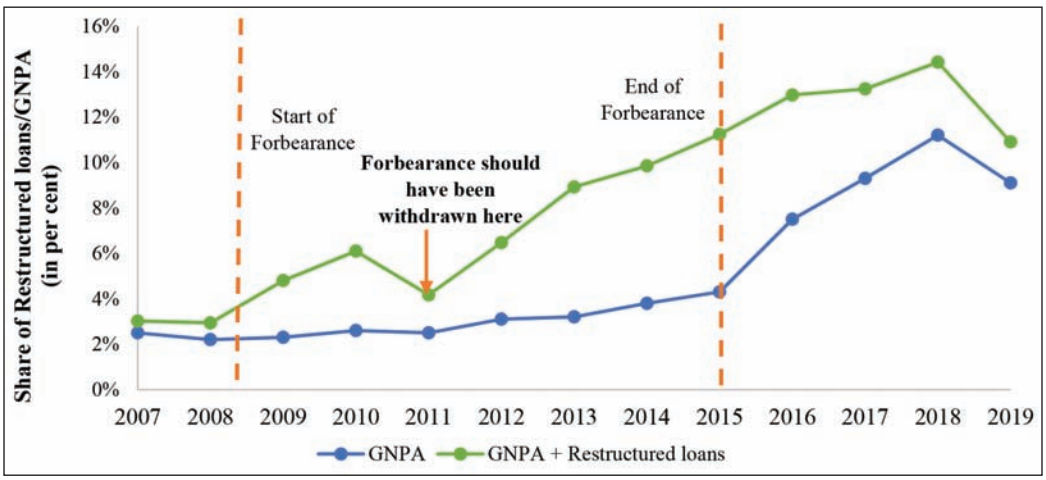

Source: RBI STRBI Table No 13 on Loans subjected to restructuring

**Figure 7: Higher Restructuring by PSBs**




Source: RBI STRBI Table No 13 on Loans subjected to restructuring
Public: Restructured loans as a share of total loans for public sector scheduled commercial banks
Private: Restructured loans as a share of total loans for private sector scheduled commercial banks

**Figure 8: Gross Non-performing Assets and Restructured loans**




Source: RBI STRBI Table No 58 on Gross and Net NPAs of SCBs.
GNPA: Gross NPA as a share of total loans
GNPA + Restructured loans: Sum of Gross NPA and Restructured loans as a share of total loans

7.4 The P. J. Nayak Committee (2014), constituted by RBI, highlighted in its report submitted in May 2014 the twin concerns stemming from the forbearance regime: ever-greening of loans by classifying NPAs as restructured assets and the resultant undercapitalization of banks. For instance, it stated, "the existing tier-I capital for public sector banks is overstated because of the regulatory forbearance which RBI provides on restructured assets. Without forbearance these assets would be categorized as NPAs, the restructuring being a response to likely imminent default. As a consequence, provisioning would rise, and tier-I capital would fall." (pp. 27) Thus, in essence, many banks were undercapitalized during the forbearance period. The report had estimated that if regulatory forbearance were withdrawn immediately in May 2014 and a prudent 70% provision cover were provided for restructured assets, tier-1 capital of the public sector banks would be written down by INR 2.78 lakh crores. As we highlight later in Section 8.6-8.8, early resolutions of banking crises limit the damage from the same to the economy. Yet, RBI dragged its feet in biting the bullet while attempting to persuade banks to recognize that the distinction between NPAs and restructured assets is nothing but accounting sleight of hand (Rajan, 2014 pp. 4). The consequent result was a further exacerbation of the situation.

7.5 Once the forbearance policy was discontinued in 2015, RBI conducted an Asset Quality Review to know the exact amount of bad loans present in the banking system. As a result, banks' disclosed NPAs increased significantly from 2014-15 to 2015-16. In the absence of forbearance, banks preferred disclosing NPAs to the restructuring of loans. Thus, the roots of the present banking crisis go back to the prolonged forbearance policies followed between 2008 and 2015.

## COST OF EXTENDED FORBEARANCE VERSUS EARLY RESOLUTION OF BANKING CRISES: INTERNATIONAL EVIDENCE

7.6 The pattern of evolution of non-performing loans over time across G20 countries provides valuable insights on the costs of extended forbearance versus early resolution of banking crises. For this purpose, the year in which a country reached its peak NPA after the global financial crisis is identified. The countries that reached their peak NPA during 2009 and 2010 (2009-2010) are called "Early Resolvers". These countries were likely early enough to recognize the bad loan problem and take the necessary steps to address it. Their share of non-performing loans started declining after 2009-10. These include countries like the United States, which immediately recognized toxic assets and launched a recapitalization program.

7.7 In contrast, "Late Resolvers" correspond to the countries that reached their peak NPAs in 2015-19, i.e. up to a decade post the crisis. As shown in the case of India, where a prolonged policy of regulatory forbearance allowed banks to delay recognition of actual NPAs, a delay in taking actions to recognize and resolve bad loans may have caused the NPAs to culminate many years after the crisis. Some important patterns between the "Early Resolvers" and the "Late Resolvers" present interesting insights.

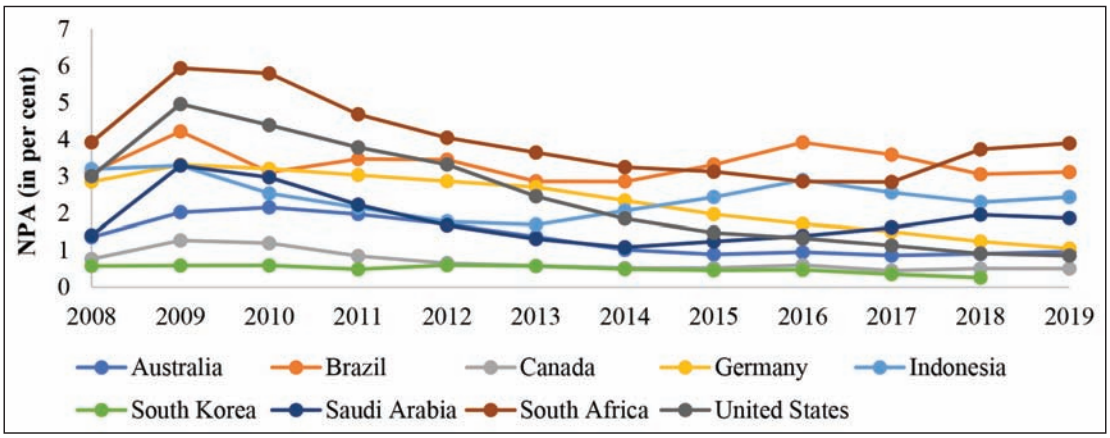
7.8 First, as seen in Table 2 and Figures 9-10, the "Late Resolvers" ended up with much higher peak NPAs than the "Early Resolvers." In fact, on average, NPAs for the late resolvers were more than thrice that for the early resolvers (figure 11). Second, and more crucially, the impact on GDP growth for the late resolvers (-1.7% on average) was significantly worse than that for the early resolvers (-0.8% on average), as shown in Table 3.

**Table 2: NPA ratio of countries and when that peaked after the Global Financial Crisis**

| Early Resolvers (2009-2010) | | Late Resolvers (2015-2019) | |
|---|---|---|---|
| | Peak NPA as % of assets | | Peak NPA as % of assets |
| Brazil | 4.21 | Argentina | 5.75 |
| Canada | 1.27 | China | 2.40 |
| Germany | 3.31 | India | 9.98 |
| Indonesia | 3.29 | Italy | 18.06 |
| Saudi Arabia | 3.29 | Portugal | 17.48 |
| South Africa | 5.94 | Russia | 10.12 |
| United States | 4.96 | Turkey | 5.02 |
| Australia | 2.15 | | |
| South Korea | 0.59 | | |
| Average | 3.22 | Average | 9.83 |

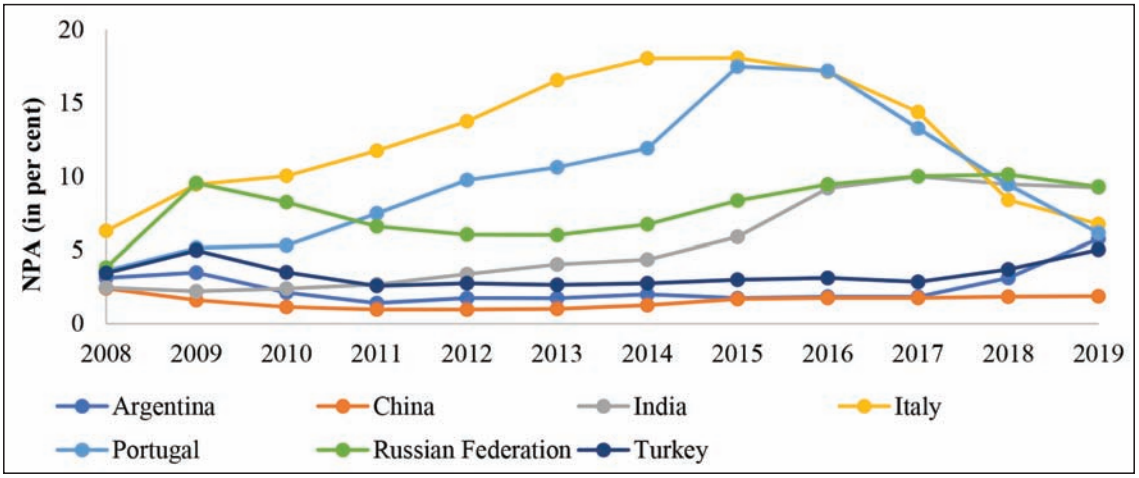
Source: IMF

**Figure 9: NPA trends for "Early Resolvers"**



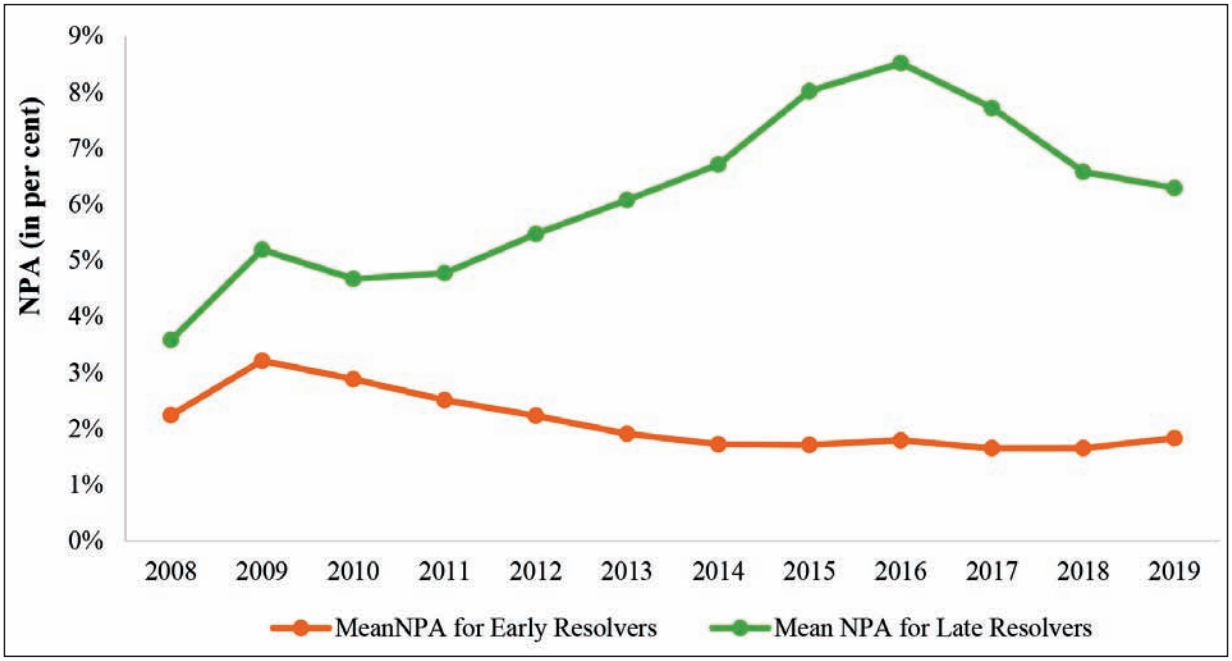

Source: IMF Financial Soundness Indicators

**Figure 10: NPA trends for "Late Resolvers"**




Source: IMF Financial Soundness Indicators

**Figure 11: NPA trends for Early Resolvers vs Late Resolvers**




Source: IMF Financial Soundness Indicators

**Table 3: Difference in post and pre-crisis GDP for Early Resolvers vs Late Resolvers**

| Early Resolvers | Average GDP growth rate (in %) | | | Late Resolvers | Average GDP growth rate (in %) | | |
|---|---|---|---|---|---|---|---|
| | Pre-crisis 1998-07 | Post-crisis 2008-19 | Difference | | Pre-crisis 1998-07 | Post-crisis 2008-19 | Difference |
| Australia | 3.59 | 2.53 | –1.06 | Argentina | 2.82 | 0.99 | –1.83 |
| Brazil | 2.99 | 1.57 | –1.42 | China | 10.01 | 7.97 | –2.04 |
| Canada | 3.19 | 1.66 | –1.53 | India | 7.16 | 6.85 | –0.31 |
| Germany | 1.63 | 1.22 | –0.41 | Italy | 1.51 | –0.32 | –1.83 |
| Indonesia | 2.81 | 5.54 | 2.73 | Russia | 5.85 | 1.44 | –4.41 |
| South Korea | 5.18 | 3.08 | –2.11 | Turkey | 4.38 | 4.55 | 0.17 |
| Saudi Arabia | 3.01 | 3.23 | 0.21 | Portugal | 2.1 | 0.43 | –1.68 |
| South Africa | 3.73 | 1.54 | –2.19 | | | | |
| United States | 3.11 | 1.70 | –1.41 | | | | |
| Average | 3.25 | 2.45 | –0.80 | Average | 4.83 | 3.13 | –1.70 |

Source: IMF

7.9 The following sections explore in detail the consequences of a prolonged forbearance policy. The discussion is divided into four broad sections. The first section discusses the impact on lending practices of banks, the second section highlights the impact on the borrowers, the

third section examines the clean-up phase, and finally, the concluding section discusses the policy implications.

## ADVERSE IMPACT OF FORBEARANCE ON BANK PERFORMANCE AND LENDING

### Undercapitalization of Banks

7.10 Banks are in the business of converting illiquid loans into liquid liabilities (Diamond and Dibvyg, 1983). In other words, while banks issue deposits repayable on demand or after a specific period, they lend to projects with long gestation periods. Therefore, they face risks both from (i) the mismatch in timing of their inflows and unexpected outflows (referred to as liquidity mismatch) and (ii) also due to unexpected surge in borrower default. Normal defaults and regular outflows are usually priced in and provided for within the regular asset-liability management (ALM) framework. Capital provides a cushion that helps banks navigate through times of abnormal depositor withdrawals and increased losses on the lending portfolio.

7.11 A policy of prolonged forbearance has the effect of overstating the actual capital and creating a false sense of security. Consider a bank with a capital adequacy ratio of 12% before forbearance[1]. Assume that during the crisis, the bank restructures 10% of its books. Absent forbearance, the bank would make provisions for such restructurings, and the capital would be reduced to the extent of such provisioning. To operate further, the bank will have to meet the regulatory threshold by raising fresh capital. However, with forbearance, the bank can restructure troubled loans and still report the capital adequacy ratio at 12%. Viewed differently, forbearance lets undercapitalized banks operate without raising capital. Inadequate capital is similar to owners not having adequate skin in the game. A long literature in finance, starting from Myers (1976), has discussed the implications of inadequate "skin in the game" among the incumbents running any organization.

7.12 Several implications follow. First, since equity capital is privately expensive to the owners of banks, the banks may use the forbearance window to withdraw their capital. For instance, in the illustration above, the bank can keep reporting healthy capital figures while the true numbers, without forbearance, might actually be lower than the regulatory threshold. If forbearance is continued for an extended period, the bank may consider the capital above the regulatory minimum as "excess" and start repaying capital to the incumbent owners as dividends (Mannil, Nishesh, and Tantri, 2020). Thus, the usual pecking order of finance (Myers (1977), Modigliani & Miller (1958)), where debt is repaid before equity, gets reversed. Eventually, when forbearance gets withdrawn, either depositors or the taxpayers are called upon to foot the bill.

7.13 The phenomenon described above transpired in the Indian banking sector during forbearance. Banks that benefited more from forbearance increased their dividend payments to incumbent management, including the government. As seen in figure 12, the difference in the average dividend payout ratio between banks with a higher share of restructured loans and banks with a lower share of restructured loans was as high as 9% in 2012-13.

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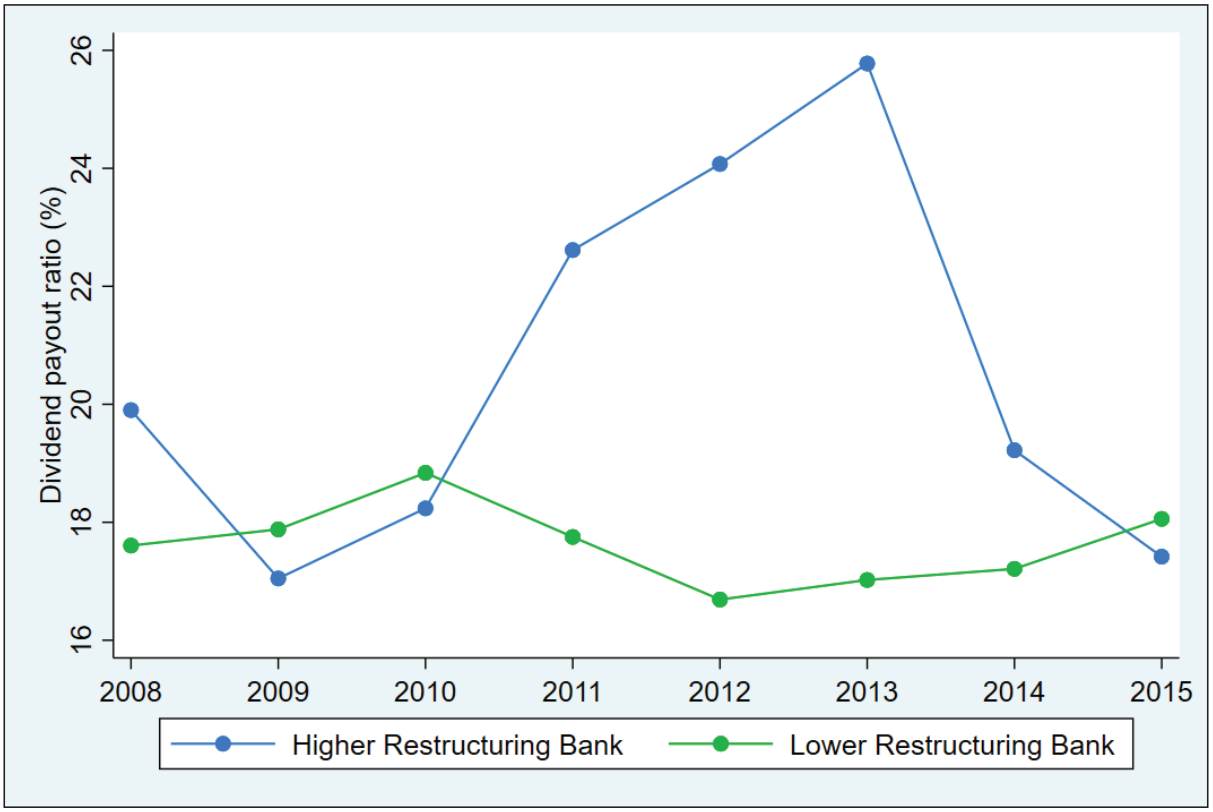
[1] Banks in India are required to maintain a capital adequacy of 9%. We ignore other types of statutory capital buffers requires as the example is for illustration purpose only.

**Figure 12: Dividend Payout by Banks**




Source: CMIE Prowess
Higher (Lower) Restructuring Bank: Average dividend payout by banks with above-median (below-median) share of restructured loans

7.14 Further, banks with a high share of restructured loans raised less fresh capital than banks with a low share of restructured loans. The former raised only 1.67% of their average assets as fresh capital during the forbearance period compared to 2.04% by the latter. More dividend payments and less capital infusion exacerbated the undercapitalization of banks with higher restructuring. The combined effect of higher dividends and lower fresh capital led to a stark difference in the Capital Adequacy Ratio (CAR) between the two types of banks. CAR was lower by close to 2.5 percentage points for banks with a higher share of restructured loans when compared to banks with fewer restructured assets in 2014-15. Thus, forbearance left several banks undercapitalized.

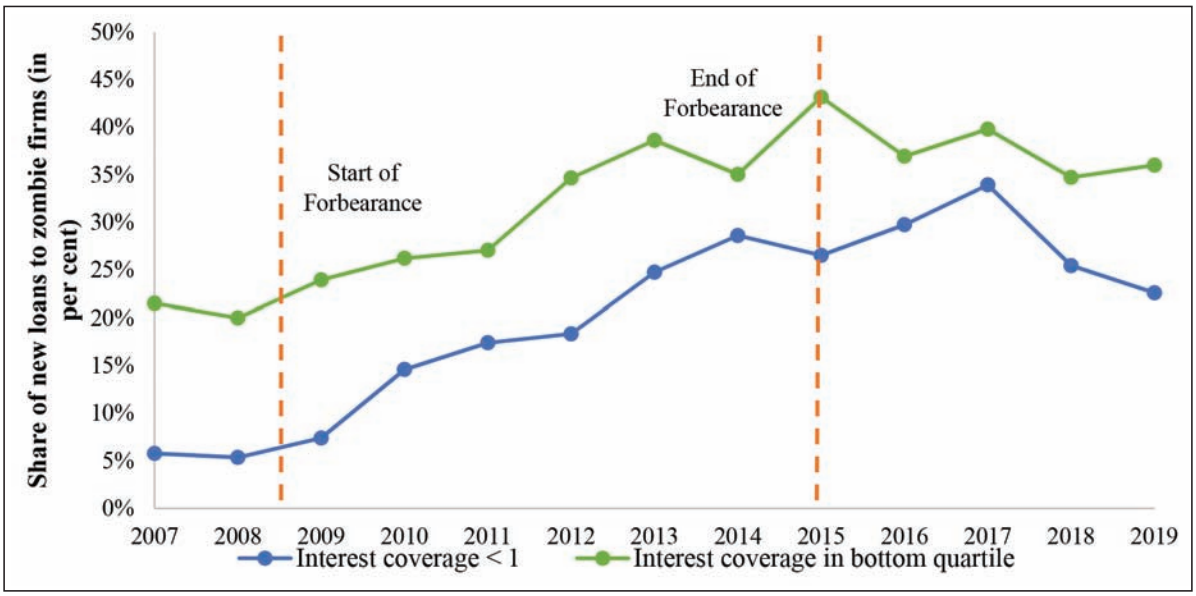
## Lending to Zombie Firms

7.15 As noted above, reduction in the capital is akin to reduced "skin in the game." It distorts the incentives of the bank owners and incumbent management. With less of their own money at stake, banks become increasingly risk-seeking (Diamond and Rajan, 2011). As explained in Box 1, undercapitalized banks find risky lending and shady lending practices, such as those based on high upfront fees, attractive.

7.16 Chari, Jain, and Kulkarni (2019) document that regulatory forbearance led to an increase in lending to low-solvency and low-liquidity firms. Precisely, the forbearance period witnessed an increase in lending to unproductive firms, popularly referred to as "zombies". Zombies are typically identified using the interest coverage ratio, the ratio of a firm's profit after tax to its total

interest expense. Firms with an interest coverage ratio lower than one are unable to meet their interest obligations from their income and are categorized as zombies. As shown in figure 13, the share of new loans to such firms increased from 5% in 2007-08 to a whopping 27% in 2014-15.

**Figure 13: Increased Zombie Lending**




Source: MCA Index of charges and CMIE Prowess

7.17 This increased lending to zombies could merely be a reflection of the poor financial performance of firms during the forbearance regime. To assess whether it is indeed the case of risky lending, a revised definition of zombie firms is considered. Under this alternative definition, zombie firms are those whose interest coverage ratio lies in the bottom quartile. This definition ensures that the proportion of zombies remains the same across all years. Even with the revised definition, the share of new loans sanctioned to zombie firms is found to increase from 20% in 2007-08 to 43% in 2014-15, as shown in figure 13. This clearly indicates an increase in risky lending by banks.

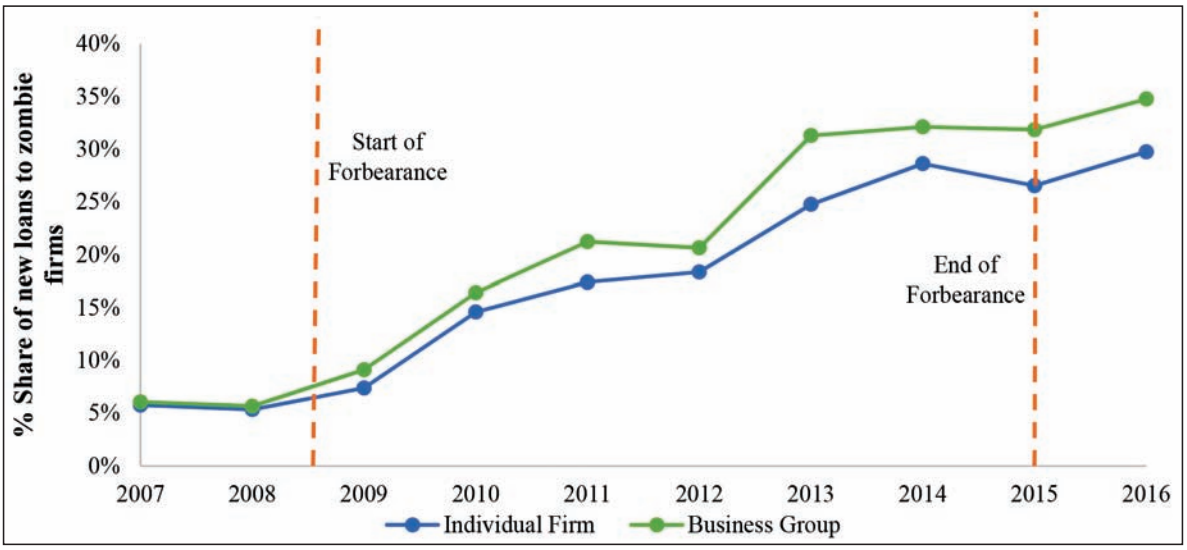
## Ever-greening of Loans

7.18 There is another motive for undercapitalized banks to engage in lending to poor quality firms: to protect their already depleted capital. One way of ever-greening loans is lending a new loan to a borrower on the verge of default, near the repayment date of an existing loan, to facilitate its repayment (Tantri, 2020). Such transactions go undetected as banks are not required to disclose them, unlike restructurings that warrant disclosures.

7.19 To further disguise their lending to distressed borrowers, banks may direct credit to other healthy firms in the business group to which those borrowers belong. Therefore, it is important to consider a business group as a whole, instead of individual firms, for a more robust estimate of zombie lending. A business group is classified as a zombie if the interest coverage ratio of the entire group is less than one. In figure 14, the green line represents the share of lending to zombie business groups and the blue line does so for individual zombie firms. The gap between the two lines reflects the lending to a healthy firm belonging to a zombie business group. This

difference reached a peak of over 6% in FY2013. Therefore, banks possibly used the above indirect mechanism of lending to firms related to zombie firms with the hope of their existing loans getting repaid. Evidence for the same is provided in Box 4.

**Figure 14: Share of New Loans to Zombie Firms**




Source: MCA Index of charges
Individual Firm: Percentage share of new loans to zombie firms (interest coverage less than one)Business Group: Percentage share of new loans to firms belonging to zombie business groups (business groups whose combined interest coverage is less than one)

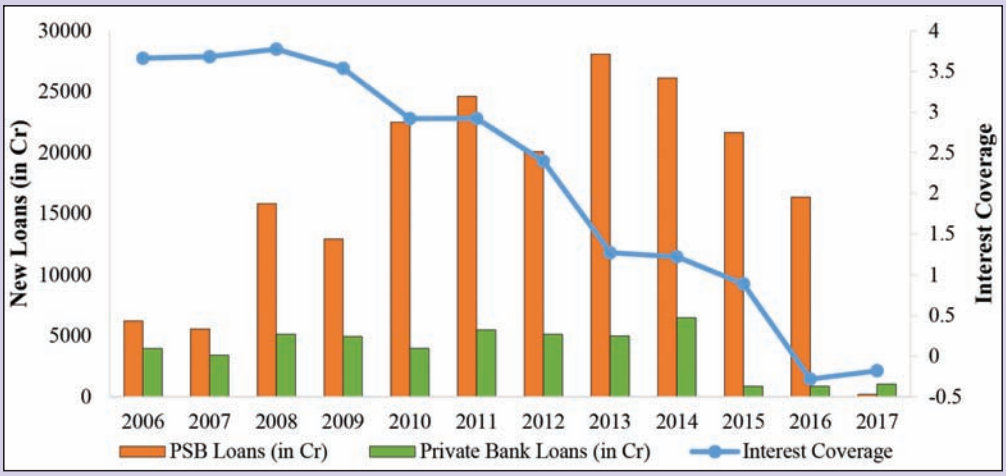
## Box 4:- Zombie lending – The case of a prominent wilful defaulter

The illustration below demonstrates how a financially troubled firm in a business group continued receiving loans through other group firms during the forbearance regime. The business group had many firms, of which 4 major firms received the bulk of loans during the period 2008-09 to 2014-15, as shown below. Firm A was the most troubled firm within the group, to whom banks ceased lending from FY2013 onwards. Yet, the same banks increased lending to firm C which could have diverted the extra credit to firm A. The group as a whole had a combined interest coverage of -0.04 between FY2013 to FY2015. Firm C, which had an interest coverage of 4.41 received loans worth INR 2,244 Cr during FY2013 to FY2015. Although the loans appeared healthy in banks' loan books, they were given to a business group under distress. This demonstrates that banks engage in proxy zombie lending by lending to healthy borrowers of a distressed group, who could ultimately divert the loans to other distressed firms within the group.

| Firm Name | Loan Amount (in Cr) | | | | Interest coverage | |
|---|---|---|---|---|---|---|
| | 2009-2012 | | 2013-2015 | | 2009-2012 | 2013-2015 |
| | PSBs | Private | PSBs | Private | | |
| Firm A | 3430 | 267 | 0 | 0 | -1.34 | -1.37 |
| Firm B | 637 | 835 | 52 | 12 | 8.51 | -0.32 |
| Firm C | 0 | 66 | 1652 | 592 | 3.85 | 4.41 |
| Firm D (sold in 2013) | 2381 | 819 | 150 | 2506 | 3.43 | -0.57 |

Dirty Dozen are the 12 large firms identified by the RBI that contributed to 25% of overall NPAs in 2016-17, i.e. INR 3.45 lakh crores. These firms are Bhushan Steel, Bhushan Power, Electrosteel Steels, JP Infra, Era Infra, Amtek Auto, ABG Shipyard, Jyoti Structures, Monnet Ispat, Lanco Infratech, Alok Industries, and Essar Steel. These firms continued to receive credit during the forbearance window even when their financial condition had worsened. As observed in the figure below, new lending to Dirty Dozen firms showed an increasing trend from 2007 to 2014, despite a fall in their average interest coverage from 3.66 in FY2007 to 0.89 in FY2015.

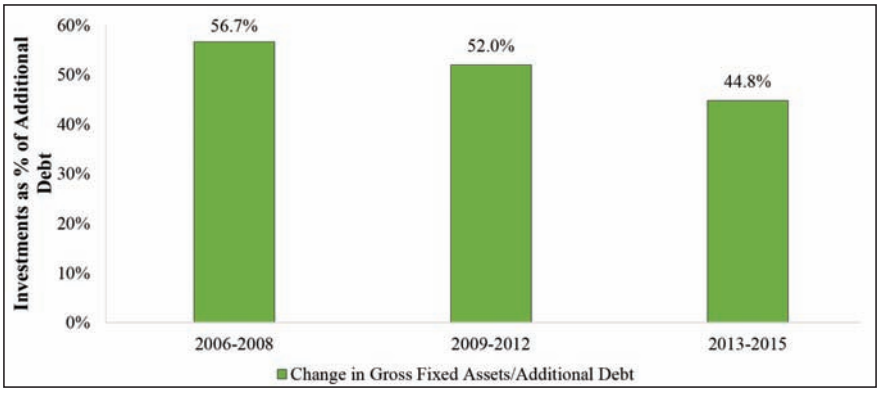
**Figure B1: New Loans Lent to Dirty Dozen Firms vs their Interest Coverage**




Source: Ministry of Corporate Affairs

7.20 Thus, forbearance resulted in increased lending to firms with poor fundamentals and higher lending to inefficient projects. Consequently, the industrial sector's increased credit growth from 2008-09 to 2014-15 failed to translate into a higher investment rate. India's Gross Fixed Capital Formation as a share of GDP reduced from 34.7% in 2008 to 28.7% in 2015. Within non-financial firms, the ratio of gross fixed capital addition to additional debt decreased from 56.7% in the 2005-2008 period to 44.8% in the 2012-2015 period, as shown in figure 15. In other words, a lesser proportion of new loans were used for capital asset creation such as buildings, plants, machinery, etc. A larger part of the credit seems to have been used to keep dead loans alive by ever-greening.

**Figure 15: Decrease in Firm Investments**




Source: CMIE Prowess

## Weakening of Corporate Governance in Borrowers benefitting from forbearance

7.21 As highlighted in the previous section, the forbearance regime witnessed a significant increase in credit supply to corporates with poor operating metrics and a simultaneous decrease in their investment-to-debt ratio. This suggests that the increased credit supply was not used productively by firms. Chopra, Nishesh, and Tantri (2020) show that this credit was instead diverted for the private benefit of the incumbent management. They argue that the incumbent managers' ability to get loans restructured under the forbearance policy strengthened their influence within the firm. Getting a loan restructured involved negotiations with the bankers who had discretion in selecting cases for restructuring. In an era of relaxed provisioning norms, firm managers formally or informally connected with bankers could persuade them to restructure loans, plausibly even unviable ones. This ability made the incumbent management's influence stronger. It became difficult for the firm's board to overthrow such managers even if they were otherwise inefficient. The increased influence of the incumbent management resulted in the weakening of the firms' governance which, in turn, had detrimental consequences in the longer run.

## Deterioration in the Quality of the Board

7.22 The institution of independent directors on the board is a robust mechanism to maintain checks and balances at the board level. Given that promoters are the controlling shareholders in most Indian firms, the non-promoter directors are specifically required to uphold the interests of minority shareholders. They are supposed to act as watchdogs against the likelihood of firms' management indulging in unhealthy practices such as expropriation of resources or investments in value-destroying projects that may personally benefit the promoters. Therefore, a decline in the proportion of non-promoter directors implies a weakening of governance among firms.

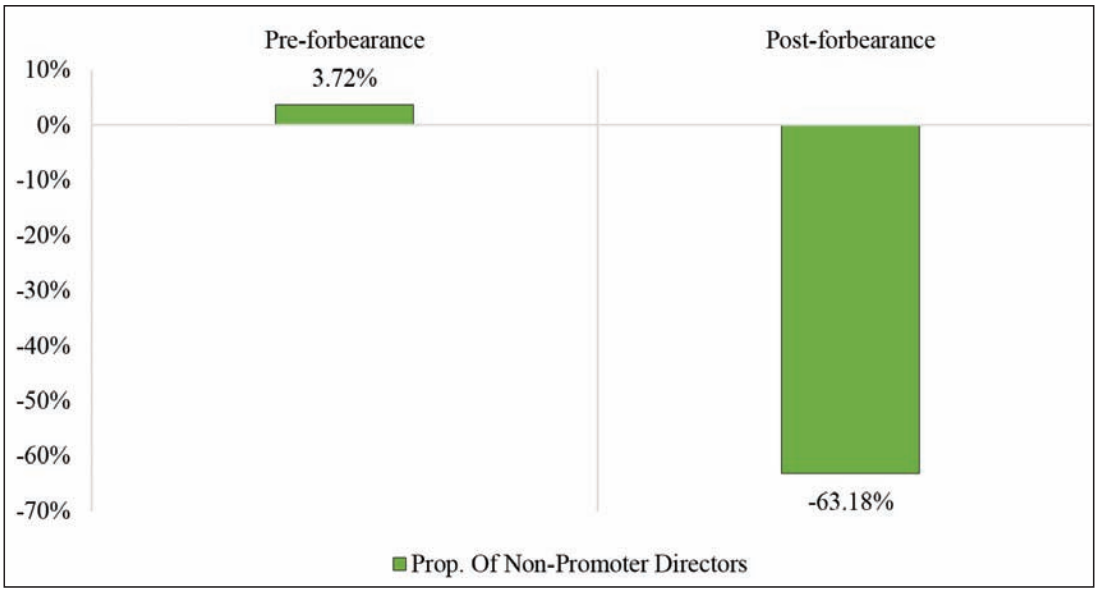
7.23 Figure 16 shows the percentage change in the average proportion of non-promoter directors two years after and two years before firms' loans were restructured. To highlight the impact of regulatory forbearance, the figure compares restructured firms during the forbearance regime (2009-2015) with those that were restructured before forbearance (2002 – 2006).[2] As evident, the percentage of non-promoters on the board decreased significantly after restructuring during the forbearance regime, while it slightly increased upon restructuring before forbearance. Hence, boards became increasingly dominated by firms' promoters during forbearance. This is further strengthened by the findings in Box 6 which show that forbearance led to an increase in incumbent management's influence as: (i) the presence of independent directors on boards declined, (ii) the propensity of a CEO becoming the chairman increased, (iii) having a connected director on board became more likely, and (iv) the bank monitoring declined as a lower number of bank-nominated directors occupied board seats.

## Inefficient allocation of capital by borrowers that benefited from forbearance

7.24 Aided by poor governance, beneficiary firms under the forbearance regime also seem to have misallocated capital in unviable projects. As shown in figure 17, the total capex projects increased only modestly for firms restructured both during the forbearance regime and before. However, there was a much higher rise in the number, proportion, and rupee value of stalled projects for

[2] The pre-period is restricted until 2006 so that two years post-restructuring does not coincide with the Global Financial Crisis and the subsequent introduction of the forbearance

**Figure 16: Weakening of Corporate Governance - Decrease in Non-Promoter Directors on Board**




Source: MCA (for restructured loans) and CMIE Prowess for the composition of boards

Pre-forbearance: Average percentage change two years after and before for firms restructured during 2002-06

Post-forbearance: Average percentage change two years after and before for firms restructured during 2009-15

restructured firms in the forbearance window. Total stalled projects (as a proportion of all capex projects) increased by 40% (30%) during forbearance, while the same witnessed a decline of 12% (18%) pre-forbearance. In other words, in the pre-forbearance period, firms likely re-initiated stalled projects when injected credit through restructuring, whereas firms in the forbearance window witnessed additional stalling, indicating a possible misuse of increased credit supply.

## Box 6: Increase in the Power of Management for Firms Benefitting from Forbearance

Using the difference-in-difference technique discussed in Box 3, this box demonstrates a causal link between forbearance and increasing power of incumbent management using panel regressions that control for all confounding factors. Here, firms are classified into two groups that are similar on dimensions such as size, age, profitability, leverage, and solvency but differ on their ability to obtain restructuring. This difference arises from their possible relationships with the banks. Any difference in firm outcomes for the two groups could thus be attributed to the difference in their likelihood of restructuring. Four outcomes are studied: (i) proportion of independent directors on board, (ii) CEO duality or the likelihood of firm's CEO to also be the chairman of its board, (iii) connectedness in board measured through the similarity in the biographies (age, education, other directorships, etc.) and (iv) proportion of board directors nominated by banks. For certain variables, data availability is restricted to the post-forbearance era. In that case, the outcomes are compared only during forbearance in a single difference between treated and control firms. After organizing data at a firm-year level, the following regression equation is estimated:

$$Y_{it} = \alpha + \beta_1 \times Treatment_i \times Post_t + \beta_2 \times Treatment_i + \beta_3 \times X_{it} + \delta_i + \nu_t + \epsilon_{it}$$

The equation includes fixed effects for firms as well as years. These fixed effects absorb any unobserved variations in firms or across years that could influence the estimates.

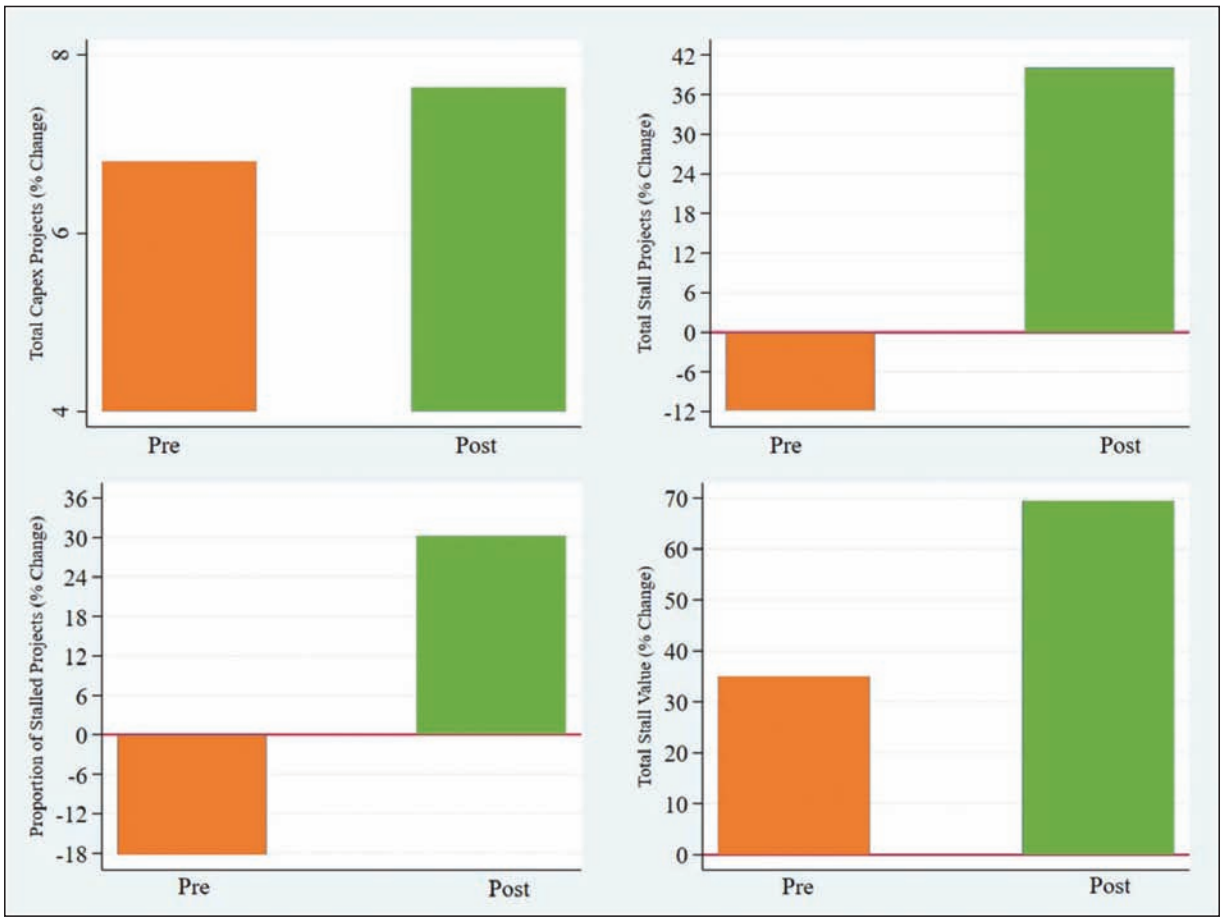
The results are as below:

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Independent Directors | | CEO Duality | | Similarity In Board | | Banks' Nominee Directors | |
| Treatment X Post | -0.008** | -0.007** | | | 0.012** | 0.012* | | |
| | (-2.587) | (-2.196) | | | (2.175) | (2.192) | | |
| Treatment | | | 0.02* | 0.02* | | | -0.005** | -0.004** |
| | | | (1.715) | (1.70) | | | (-3.835) | (-3.053) |
| | | | | | | | | |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| | | | | | | | | |
| Observations | 83,844 | 82,862 | 7,826 | 7,796 | 10,323 | 10,285 | 7,827 | 7,797 |
| R-squared | 0.835 | 0.835 | 0.253 | 0.256 | 0.707 | 0.704 | 0.045 | 0.055 |
| Fixed Effects | Firm and Year | | Year | | Firm and Year | | Year | |

Table 4: Table shows a difference-in-difference or single-difference specification to estimate the change in the composition of boards within firms. Data are organized at a firm-year level with years ranging from 2002 to 2015. Independent director represents the proportion of independent directors. CEO duality is an indicator variable that takes the value of 1 if the CEO is also the chairman of the board and 0 otherwise. Similarity in board captures the within-board connectedness based on the cosine similarity of texts in biographies of all members in the board. Banks' nominee director represents the proportion of directors that are nominated by lending institutions. Treatment is an indicator variable that takes the value of 1 for firms that have above-median likelihood to benefit from forbearance in the form of higher restructurings. Post is another indicator variable that takes the value of 1 for years 2009 – 2015 and 0 otherwise. included in even-numbered columns, refers to firm-level time-varying control variables: number of banking relationships, average loan duration, and completed loans in the last 5 years. stands for firm fixed effects whilerepresents year fixed effects. Standard errors, presented in parenthesis, are clustered at the firm level. *p<0.1; **p<.05; ***p<0.01. Source: Chopra, Nishesh, and Tantri (2020).

Coefficients for all the variables turn out to be statistically significant at standard levels. The coefficients are negative for independent directors and banks' nominee directors and positive for CEO duality and similarity in board. This suggests that board quality in firms more likely to benefit from forbearance weakens as their share of independent directors decreases. Even monitoring by lending institutions declines with a falling representation of bank-nominated directors. At the same time, incumbent managers in such firms become more powerful. Boards of such firms are likely to recruit members connected to their management and the likelihood of a firm's CEO also being the board's chairman increases. Collectively, this suggests that forbearance leads to an increase in incumbent management's influence over the board.

**Figure 17: Misallocation of Credit during Forbearance – Evidence from Capital Expenditure of Firms Benefitting from Restructuring**

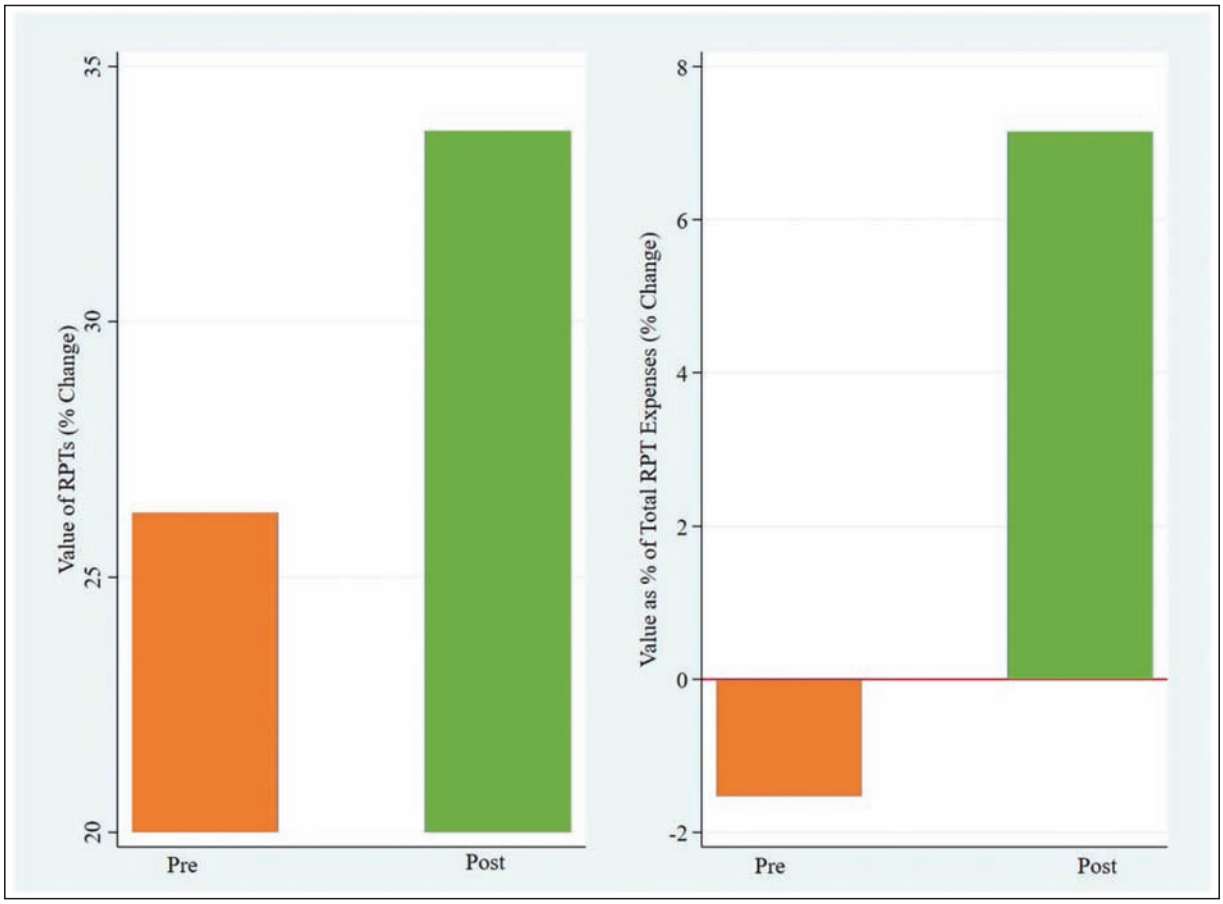



Source: MCA (for restructured loans) and CMIE Prowess for the composition of boards
Pre: Average percentage change two years after and before for firms restructured during 2002-2006
Post: Average percentage change two years after and before for firms restructured during 2009-2015

## Mis-appropriation of resources in borrowers that benefited from forbearance

7.25 Another likely consequence of strong management influence and declining governance is the increase in private benefits being redirected to the firms' management. In the Indian context, related party transactions (RPTs) are often utilized to camouflage the expropriation of firm resources. Incumbent management can force the firm to engage in related party transactions with entities connected to key managerial personnel. This is shown in figure 18. Related party transactions to key personnel increased by around 34% among firms whose loans were restructured during the forbearance regime. When taken as a proportion of total expenses, related party transactions to key personnel increased by over 7%. In comparison, among firms restructured before forbearance, the related party transactions to key personnel increased by 26% in absolute terms but decreased by 1.5% as a proportion of total expenses. Box 7 shows the results of careful panel regressions that demonstrate a jump in overall management compensation and directors' sitting fees during the forbearance regime. Hence, the increased, lax restructuring seems to have resulted in the misappropriation of firm resources at the cost of minority shareholders.

**Figure 18: Misappropriation of Firm's Resources – Evidence from Related Party Transactions to Key Personnel**




Source: MCA (for restructured loans) and CMIE Prowess for the composition of boards
Pre: Average percentage change of two years after and before for firms restructured during 2002-2006
Post: Average percentage change two years after and before for firms restructured during 2009-2015

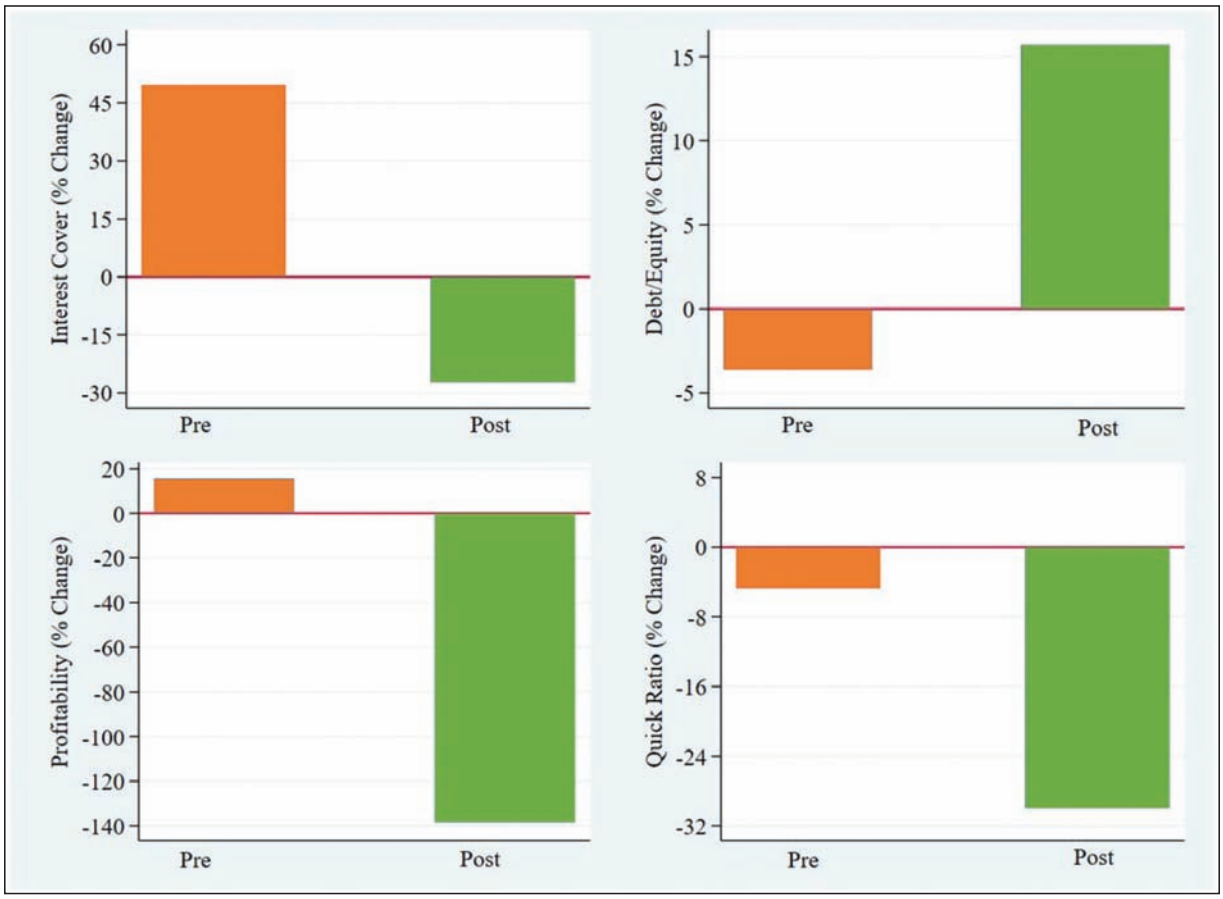
## Deterioration in performance of borrowers benefiting from forbearance

7.26 As a consequence of the weakened governance, the impacted firms' performance deteriorated. Figure 19 reports industry-adjusted changes in key firm fundamental ratios two years before and after restructuring, both for the pre and post-forbearance regimes. There was a significant increase in leverage (15.7%), measured as the ratio of debt to equity, accompanied by a 27.2% decline in the interest coverage for firms restructured during the forbearance regime. As noted before, interest coverage measures the ability of a firm to cover debt servicing costs from current profits. Interestingly, firms restructured before forbearance reported a 3.4% decrease in leverage, and a significant 49.6% increase in interest cover after their loan was restructured. There also seems to be a detrimental impact on firms' liquidity, as evidenced by a 30% decrease in their quick ratio compared to a marginal 4% decrease in the pre-period.[3] Finally, the firms' profitability, measured as profits as a proportion of firms' assets, suffered a sharp decline of over 138% in the forbearance era. In other words, firms benefitting from restructuring during the forbearance regime, on average, turned loss-making, whereas profitability improved by around 15% for restructured firms in the pre-forbearance

[3] For a firm, quick ratio is defined as the ratio of its current assets to its current liabilities

period. Overall, while firm fundamentals usually improved upon restructuring in the pre-forbearance era, they significantly declined under forbearance. Note that, these values are adjusted for industry and year and thus are not influenced by macroeconomic shocks during the forbearance regime.

**Figure 19: Deterioration in Operating Metrics and Performance of Firms Benefitting from For forbearance**




Source: MCA (for restructured loans) and CMIE Prowess for the composition of boards
Pre: Average percentage change two years after and before for firms restructured during 2002-2006
Post: Average percentage change two years after and before for firms restructured during 2009-2015

## Box 7: Misappropriation of Resources by Firms Benefitting from Forbearance

Using the difference-in-difference technique discussed in Box 6, this box shows the impact of forbearance on increased remuneration to boards of firms that benefited from the forbearance. There are two outcomes studied: (i) Management Compensation and RPT — the total compensation of the key management in the firm including any related party transactions with them and (ii) Directors Salary - the total remuneration of all directors on the board. With the identifications and regression framework remaining the same, the following results are obtained:

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| VARIABLES | Management Compensation and RPT | | Directors Salary | |
| Treatment X Post | 0.231** | 0.242*** | 0.071* | 0.075* |
| | (2.492) | (2.619) | (1.788) | (1.916) |
| Controls | No | Yes | No | Yes |
| Observations | 91,566 | 90,576 | 38,931 | 38,579 |
| R-squared | 0.688 | 0.689 | 0.817 | 0.818 |
| FE | Firm and Year | | | |
| Clustering | Firm | | | |
| Observation Level | Firm-Year | | | |

Table 5: Table shows a difference-in-difference specification to estimate the change in compensation to management within firms. The outcome variables are explained above. All the variables and notations remain the same as in Table 4. Source: Chopra, Nishesh, and Tantri (2020).

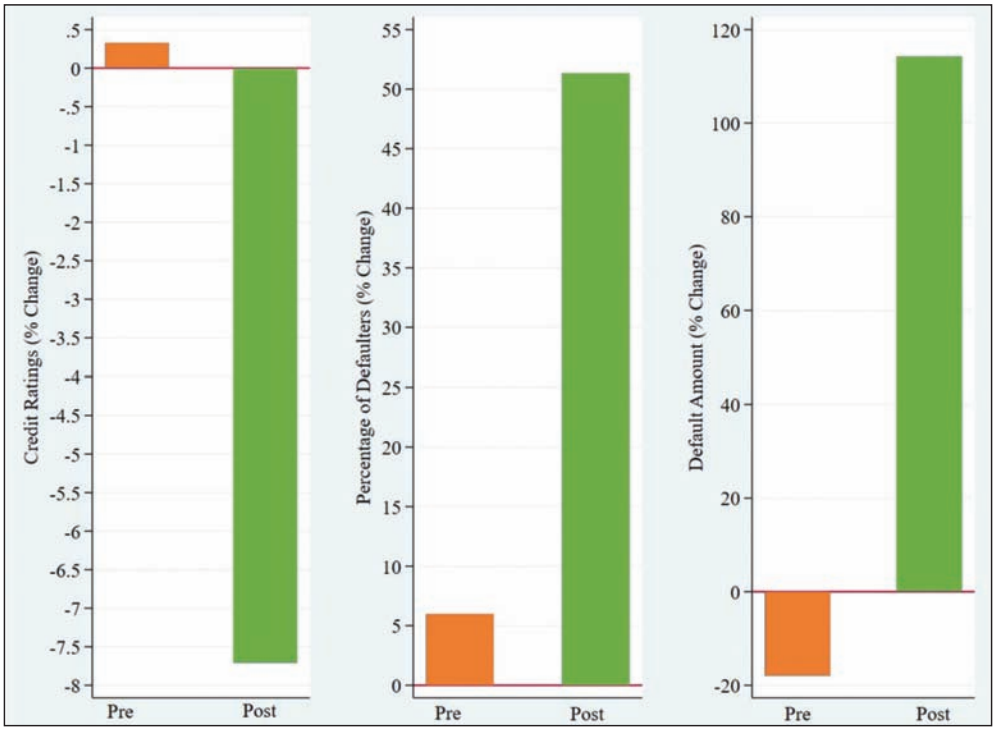
Coefficients for both the variables are positive and have standard statistical significance. The firms likely to benefit from forbearance, therefore, increase remuneration to their key management personnel. This suggests that forbearance results in an increase in benefits being redirected to firms' management.

### Increased defaults by borrowers benefitting from forbearance

7.27 Subsequent to the deterioration in their fundamentals, restructured firms in the forbearance window also witnessed a decrease in their credit ratings. Figure 20 shows that the average credit rating for a firm deteriorated by 7.7% upon restructuring during the forbearance regime while the same marginally improved (0.33%) before forbearance. The forbearance regime also accompanied an increase in defaults by restructured firms when compared to a decrease in the same in the pre-forbearance era. The proportion of restructured firms that became defaulters increased by 51% in the forbearance period, while the pre-period increase was comparatively marginal (by 6%). In terms of the amount under default, the figure more than doubled (an increase of 114%) in the post-forbearance period compared to an 18% decrease in the value before forbearance. Once again, restructuring in the pre-forbearance era seems to have helped distressed and defaulting borrowers repay their debt and undo their defaulter tag. However, firms benefitting from restructuring during the forbearance window, on average, started defaulting more.

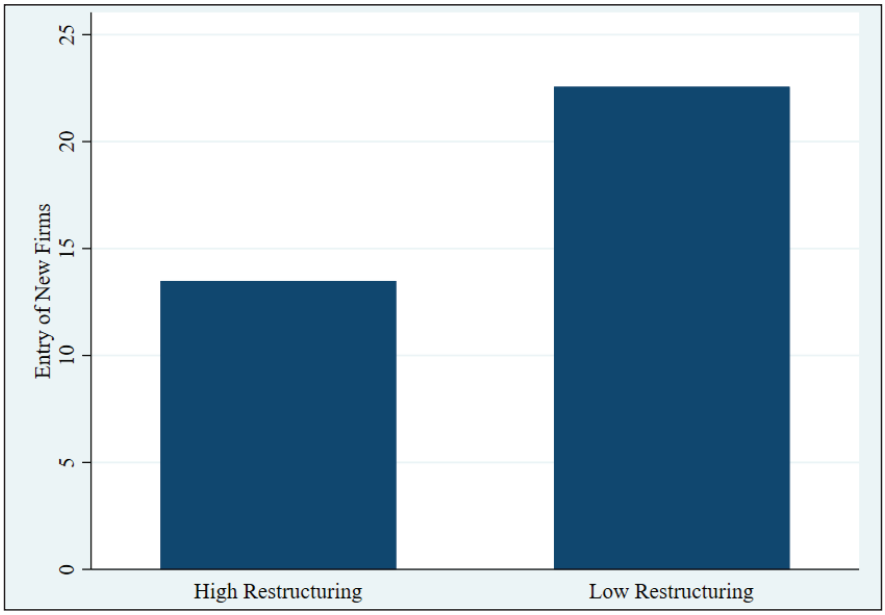
7.28 In conclusion, the prolonged forbearance policy meant to address grievances of crisis-hit borrowers led to unintended negative consequences for the firms in the long run. The internal governance of the firms weakened, misappropriation of resources increased, and their fundamentals deteriorated. On a macroeconomic front, as shown in figure 21, under the forbearance window, a higher share of restructured firms within an industry was also associated with a decrease in the entry of new firms in the industry.

**Figure 20: Accelerated Firm Defaults due to Forbearance**




Source: MCA (for restructured loans), CMIE Prowess for credit ratings, and CIBIL's website for suit-filed database of defaulters
Pre: Average percentage change two years after and before for firms restructured during 2002-2006
Post: Average percentage change two years after and before for firms restructured during 2009-2015

**Figure 21: Macroeconomic Impact - Decline in Industry Competition due to Forbearance**




Source: MCA (for restructured loans), CMIE Prowess for firm incorporations
High (Low) Restructuring: Industries that had above (below) median share of restructured firms

## BANK CLEAN-UP WITHOUT ADEQUATE CAPITALIZATION

7.29 Finally, after continuing forbearance for seven years, the RBI decided to bite the bullet and withdrew regulatory forbearance starting from April 2015. The RBI also decided to conduct a

detailed Asset Quality Review (AQR) to know the true status of banks' NPAs. However, as Chopra, Subramanian, and Tantri (2020) document, the AQR exacerbated the problem as it neither mandated capital raising by banks nor provided a capital backstop even though it was certain that banks' capital would be adversely impacted following the AQR.

7.30 Economic theory highlights that two contrasting outcomes were possible with such an AQR. In the optimistic view, the AQR was expected to lead to a reduction in information asymmetry. The critical assumption – as hypothesized in Diamond and Rajan, 2011– was that the resultant cleaner bank balance sheets would help banks to raise more private capital on their own, thereby improving the quality of financial intermediation. Along these lines, the RBI's view was that the program was a "deep surgery" that would lead to healthy bank balance sheets (Rajan, 2016).

7.31 However, a more sobering outcome could have been expected from an application of the impact of asymmetric information problems on the likelihood of capital raising. Myers and Majluf (1984) predict that firms in distress would have no incentive to raise equity voluntarily as managers – who know more about the firm's fundamentals than investors – fear dilution of the value of equity. Therefore, absent a policy for either mandatory capital raising or capital backstop, incumbent shareholders and managers of banks – who would invariably know more about the bank's fundamentals than the regulator or investors – have no incentive to raise equity capital. Implicit government guarantees further dis-incentivize capital raising (Admati and Hellwig, 2014). As a result, under-capitalized banks may again resort to risk-shifting and zombie lending, thereby severely exacerbating the problem. The adverse impact could then spill over to the real economy through good borrowers and projects being denied credit. The resultant drop in the investment rate of the economy could then lead to the slowdown of economic growth. Chopra, Subramanian, and Tantri (2020) provide careful evidence that this is precisely what transpired following the AQR.

## The crucial difference vis-à-vis bank clean-ups in the rest of the world

7.32 In this context, it is crucial to understand that India's AQR differed from the typical bank clean-ups carried out in other major economies such as Japan, the European Union, and the U.S. in two key aspects. First, the clean-up was undertaken when the country was not undergoing an economic crisis. Given the economic stability, RBI assumed that markets would supply the required capital to banks once their books are cleaner, as explained in Section 8.30. Second, there was neither a forced recapitalization of the banks nor was an explicit capital backstop provided for. RBI initiated the AQR under the presumption that the extent of additional loan provisioning required due to the clean-up would not generate needs for a severe recapitalization of the banks.[4]

[4] For instance, Rajan (2016) states: "The Government has been fully involved and supportive. We have mapped out a variety of scenarios on possible outcomes. The Finance Minister has indicated he will support the public sector banks with capital infusions as needed. Our estimate is that the government support that has been indicated will suffice… Our projections are that any breach of minimum core capital requirements by a small minority of public sector banks, in the absence of any recapitalization, will be small… What the Government has already explicitly committed is, in our view, enough to take care of all reasonable scenarios, and the Government has committed to stand behind its banks to whatever extent needed." The RBI envisaged the program as temporary and the banking sector "to have a clean and fully provisioned balance sheet by March 2017… In sum, while the profitability of some banks may be impaired in the short run, the system, once cleaned, will be able to support economic growth in a sustainable and profitable way." For private sector banks, RBI expected that "Our various scenarios also show private sector banks will not want for regulatory capital as a result of this exercise."

## The inadequate clean-up of bank balance sheets

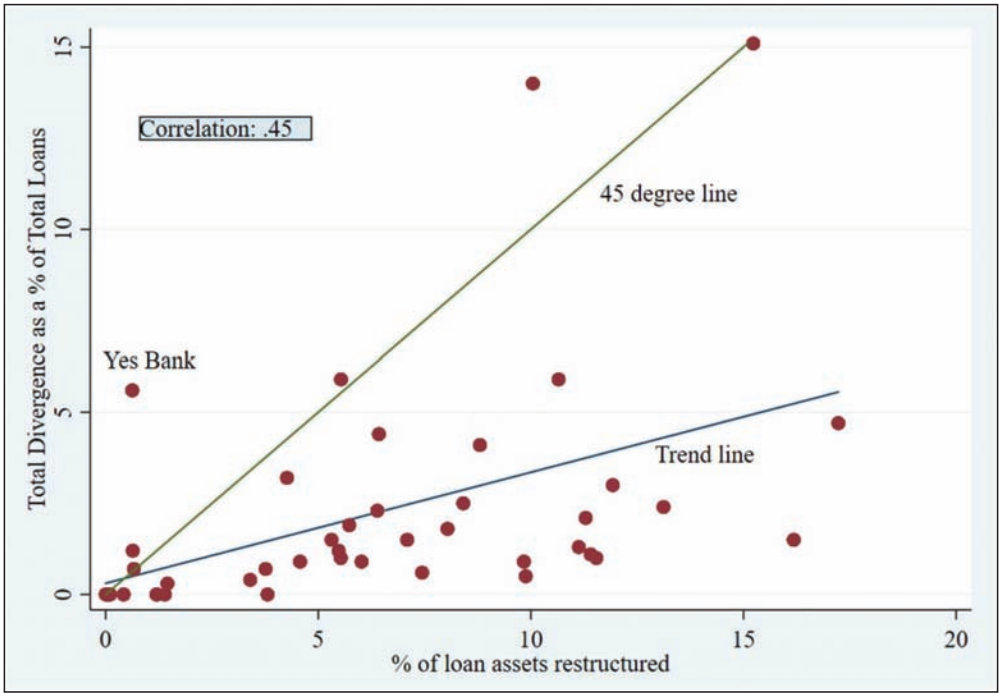
7.33 In reality, the AQR exercise significantly under-estimated the full extent of NPAs as well as the resultant capital infusion that was required to ensure that the bank balance sheets indeed become healthy. In terms of additional (gross) NPAs, public sector banks added about INR 5.65 lakh crores from FY2016 to the end of FY2019.[5] To put this amount in perspective, the additional NPAs translated to about 7.9% of the total tax revenue over this period.

7.34 To be sure, the AQR did lead to some clean-up of the toxicity in the bank balance sheets. Figure 22 plots the accumulated proportion of restructured loans reported by the banks (FY2009 to FY2015) against their NPA divergence during the AQR regime (FY2016 to FY2019). NPA divergence is the difference in banks' reported NPA numbers and the NPA assessed by the RBI, taken as a proportion of total loans. A positive correlation indicates that the AQR did identify some bad loans lent through restructuring activities. However, the effectiveness of the AQR exercise cannot be assessed from such a simple positive association, especially given the statistically low correlation (0.45). Also, notice that most banks are found to lie below the 45° line. This means that, in most cases, the identified NPAs were smaller in comparison to the loans restructured by the bank.

7.35 Kashyap, Mahapatro, and Tantri (2020) argue that the AQR was mostly restricted to targeting bad lending through restructuring, rather than identifying subtle ever-greening activities. Notice that loan restructuring warrants a disclosure whereas fresh lending does not. Therefore, rather than restructuring, banks could have easily lent a new loan to an existing borrower on the verge of default. To further camouflage their incentives, they could have disguised the payment in the form of fresh lending to a network of related parties of the actual firm in distress. Figures 23 and 24 plot the accumulated proportion of lending (FY2009 to FY2015) in the form of these two *subtle* ever-greening possibilities against the gross NPA divergence disclosed by banks. Figure 23 plots the proportion of direct lending to borrowers with interest coverage less than one while figure 24 plots lending activity for such borrowers through the channel of related parties. The extremely low correlations (which is, in fact, marginally negative in one case) between divergence and ever-greening measures signify that the AQR exercise failed to recognize *subtle* ever-greening and thus may have been unable to curb distortionary lending. Almost all banks in the two figures lie below the 45° line which further indicates the nominal extent of ever-greening unearthed during the exercise. Interestingly, Yes Bank, which was recently rescued by the RBI, stands as an outlier in both these graphs. While the bank's divergence was just around 5%, its ever-greening indicators were as high as 38%-52%. The sharp rise in the bank's reported NPAs (0.75% in FY2016 to 16.8% in FY2020) seems unsurprising from this analysis.

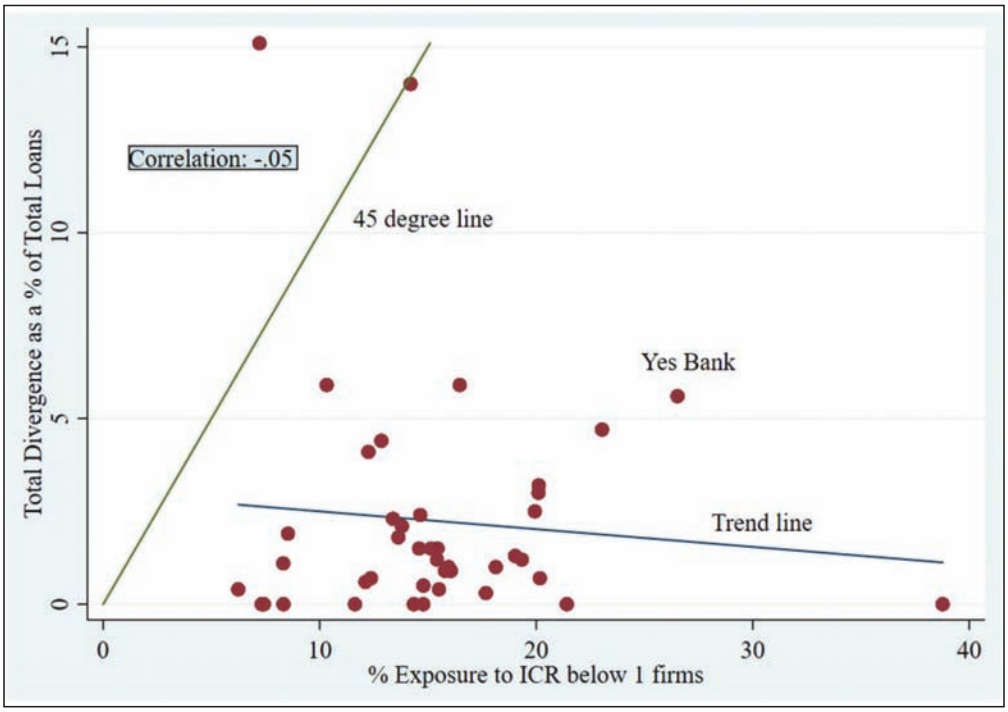
[5] The only mention of AQR is in the Financial Stability Report of June 2016, which mentions "The gross non-performing advances (GNPAs) ratio increased sharply to 7.6 per cent from 5.1 per cent between September 2015 and March 2016, largely reflecting reclassification of restructured standard advances as non-performing due to asset quality review (AQR)." Clearly, the report gives no details about the assumptions involved or the procedure followed in the exercise.

**Figure 22: Clean-up by the AQR – Positive Correlation with Restructuring Activities**



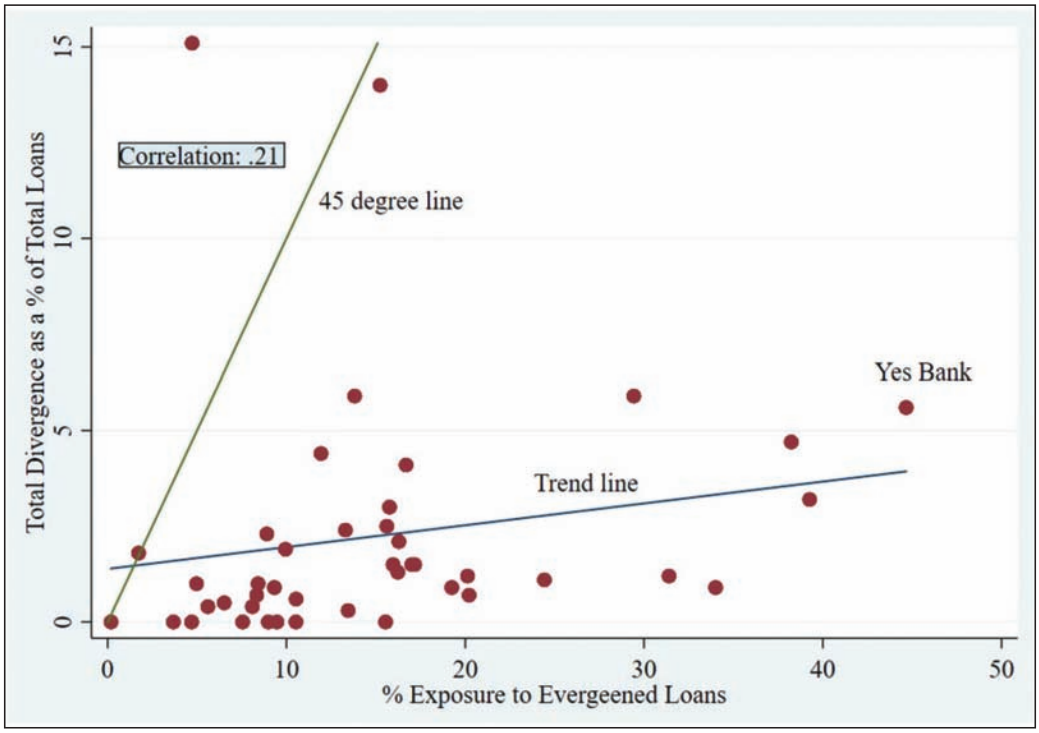

Source: Ministry of Corporate Affairs and CMIE Prowess

**Figure 23: The AQR did not identify ever-greening: No Correlation of Divergence with Lending to Zombie Firms**




Source: Ministry of Corporate Affairs and CMIE Prowess

**Figure 24: The AQR did not identify ever-greening: Weak Correlation of Divergence with lending to Related Parties**




Source: Ministry of Corporate Affairs and CMIE Prowess

7.36 The recent events at Yes Bank and Lakshmi Vilas Bank corroborate that the AQR did not capture ever-greening carried out in ways other than formal restructuring. Table 6 reports the Gross NPA ratio of Yes Bank Ltd. and Lakshmi Vilas Bank. Had the AQR exercise detected ever-greening, the increase in their reported NPAs should have been in the initial years of the AQR. Our analysis clearly shows that most of the non-performing loans were lent and restructured during the forbearance phase. Hence, the RBI audit missed some severe cases of ever-greening by these banks. The fact that both these banks had to be rescued by the regulator also goes against RBI's assumption that the private banks should have been able to raise the required capital after the clean-up.

**Table 6: Gross NPA of Yes Bank and Lakshmi Vilas Bank**

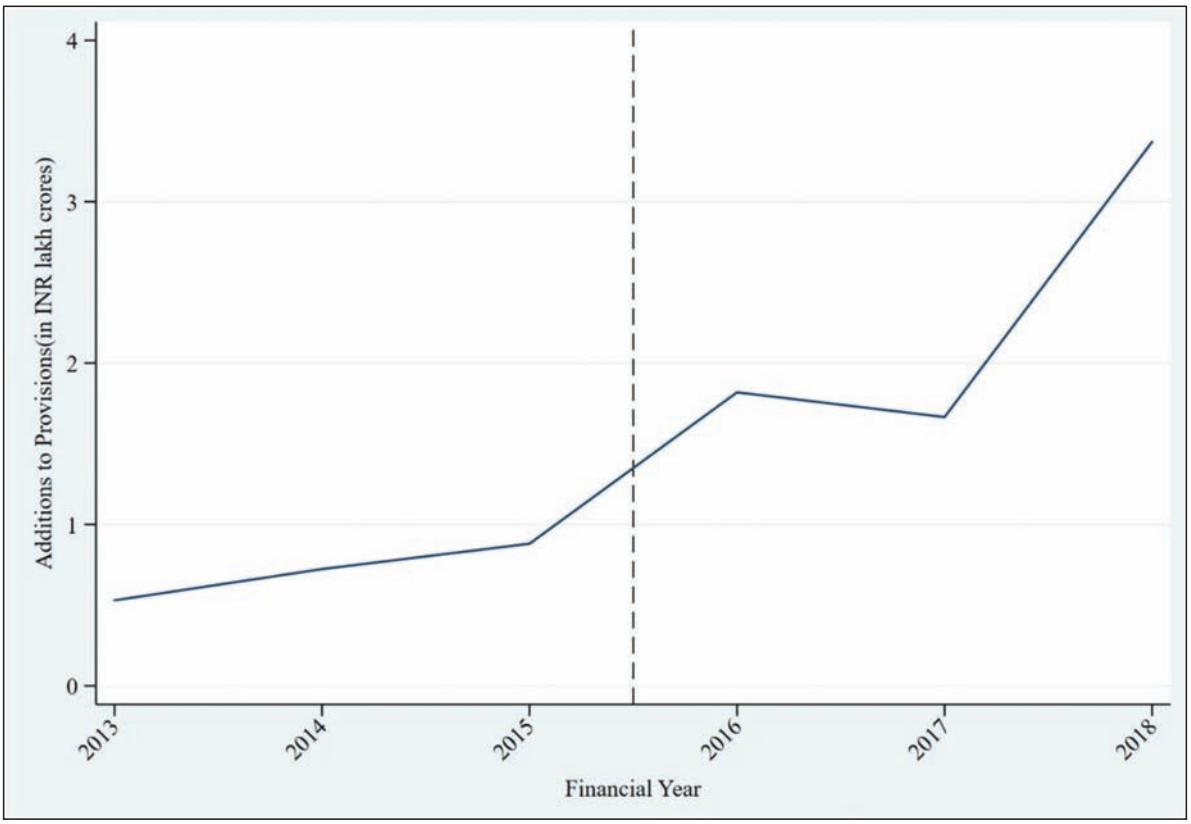
| | Yes Bank Ltd. | Lakshmi Vilas Bank Ltd. |
|---|---|---|
| FY2016 | 0.76 | 1.97 |
| FY2017 | 1.52 | 2.67 |
| FY2018 | 1.28 | 9.98 |
| FY2019 | 3.22 | 15.30 |
| FY2020 | 16.80 | 25.39 |
| Q2FY2021 (Unaudited) | 16.90 | 24.45 |

Source: Annual Reports

7.37 If the AQR had correctly identified all the hidden bad quality assets on banks' books, all the increase in NPAs and the necessary provisioning would have concluded by the stated

deadline of FY2017. However, the gross NPAs in the Indian banking sector only increased to 11.2% by FY2018. A massive surge in loan loss provisioning also occurred in FY2018 – a year *after* AQR was supposed to make bank balance sheets healthy. As shown in figure 25, the additional provisions doubled in FY2018. For instance, in FY2016 and FY2017, the Punjab National Bank reported additional provisions at INR 18,145 crores and INR 15,881 crores, respectively. In FY2018, the additional provisions increased to INR 31,459 crores. The rise in provisioning depleted banks' capital.

**Figure 25: Inadequate identification of hidden bad assets under the AQR: Sharp rise in provisioning a year after completion of the AQR**




Source: Chopra, Subramanian, and Tantri (2020)

## Under-estimation of required bank capital

7.38 The actual capital required by public sector banks significantly exceeded the amount that the RBI seems to have estimated before the AQR. In the first year of the AQR, the total capital infused into public sector banks was INR 25,000 crores with an intended plan of infusing INR 45,000 crore in the next three years under *Mission Indradhanush*. However, by the end of FY2019, i.e. four years after the inception of the AQR, the government had infused INR 2.5 lakh crores in the public sector banks. The addition of capital amounted to 44.24% of the added (gross) NPAs. Box 8 presents the regression results from Chopra, Subramanian, and Tantri (2020) to show that banks, both private and public, did not recapitalize themselves adequately after the clean-up. Consequently, the banks were left significantly undercapitalized. Recall that RBI's assessment in this context was that "the government support that has been indicated will suffice… enough to take care of all reasonable scenarios."

## Box 8: Inadequate Capital Raising by Banks

Using the below specification, Chopra, Subramanian, and Tantri (2020) document that banks, both private and public, became undercapitalized after the AQR.

$$Y_{it} = \alpha + \beta_1 \times Exposure_{it} + \beta_2 \times Exposure_{it} \times Public\ Sector\ Bank_i + \nu_i + \delta_t + \epsilon_{it}$$

Data are organized at a bank-year level with years ranging from 2013 to 2019. There are two dependent variables (i) total additions in the paid-up capital as a percentage of the bank's total assets, and (ii) total additions in paid-up capital minus the divergence in provisions under the AQR as a percentage of the bank's total assets. The independent variables are the bank's *Exposure to AQR* and an indicator variable for *Public Sector Banks*. *Bank's Exposure to AQR* equals the bank's divergence in provisions due to the AQR (as a % of total assets). and refer to bank and year fixed effects respectively. Bank fixed effects ensure that any bank-specific time-invariant effect does not influence the results. Column (1) indicates that higher the reported additional provisions due to the AQR, higher was the capital infusion. Column (2) indicates that this is true only because of the capital infusion into public sector banks. About the sufficiency of the capital infusion, the negative and much larger coefficient in column (3) points out that the capital additions were vastly insufficient to offset the additional provisions due to the AQR. In other words, when adjusted for additional provisions, banks' capital actually declined.

| VARIABLES | (1) Additions in Paid-Up Capital (in %) | (2) | (3) Addition to Paid-Up Capital after Adjusting for Divergence (in %) |
|---|---|---|---|
| Bank's Exposure to AQR | 0.1859** | -0.1247 | -0.8141*** |
| | (2.2620) | (-1.2679) | (-9.9030) |
| Bank's Exposure to AQR X Public Sector Banks | | 0.3902** | |
| | | (2.6037) | |
| Observations | 297 | 297 | 297 |
| R-squared | 0.3023 | 0.3133 | 0.4251 |
| FE | Bank & Year | | |
| Clustering | Bank | | |

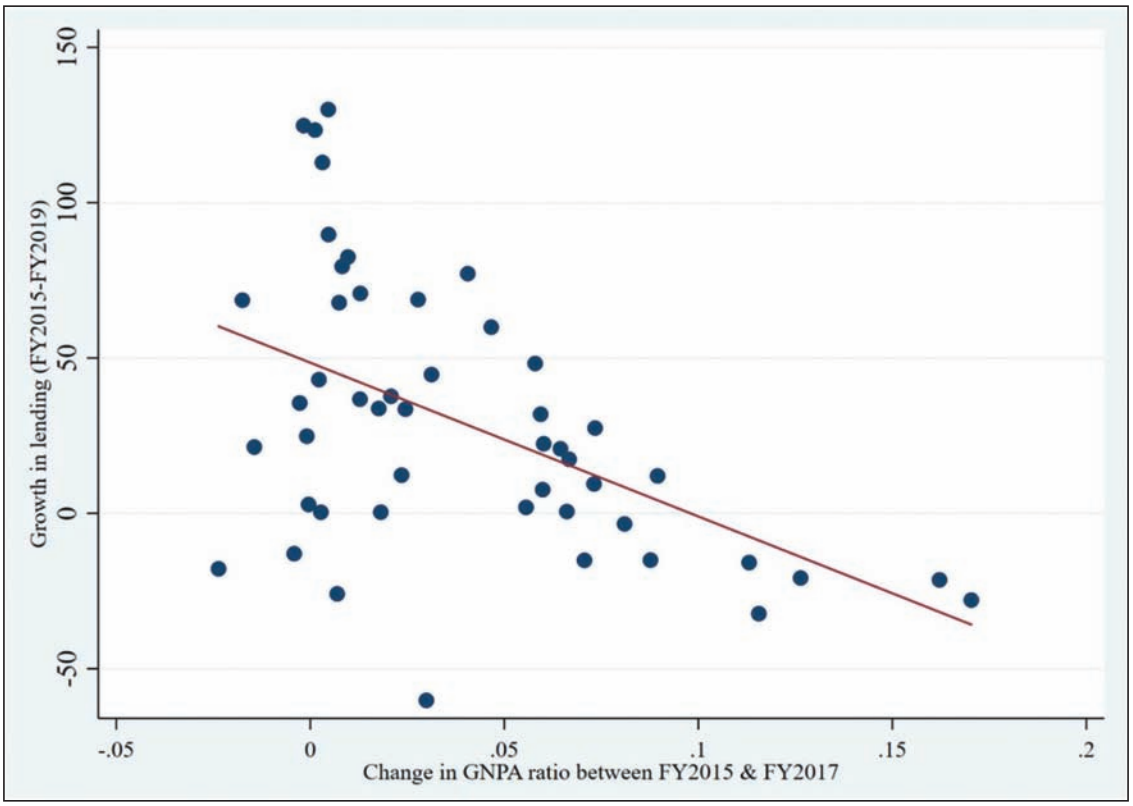
Table 7: This table reports the OLS estimates of the impact of divergence in provisions on the capital infusion using the equation above. Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *p<0.1; **p<.05; ***p<0.01. Source: Chopra, Subramanian, and Tantri (2020).

### Adverse impact on lending

7.39 As the banks were unable to raise adequate fresh capital after the clean-up, their lending reduced. Figure 26 plots the percentage change in lending by each bank against the difference in its gross NPAs in 2017 (two years after the commencement of the AQR) and 2015 (just before the AQR). There was a sharp decline in lending post the increased NPAs that resulted from the

AQR. Figure 27, which plots the share of lending to zombie firms against the difference in bank's NPA, suggests that the affected banks, however, increased their exposure to risky borrowers. The economic rationale behind the relationship between reduction in capital and increased risky lending has already been explained in Box 1. Thus, in an already stressed banking sector, the second wave of under-capitalization caused by the AQR created perverse incentives to lend even more to the unproductive zombie borrowers. Box 9 shows this evidence using panel regressions that control for various confounding factors.

**Figure 26: AQR's Impact on Bank Lending**




Source: CMIE Prowess and Ministry of Corporate Affairs

## Box 9: Impact of the AQR on overall lending and zombie lending through undercapitalization

**The decline in overall lending:**

Chopra, Subramanian, and Tantri (2020) use the below panel regression to document the impact of the AQR on overall lending by the banking sector:

$$Log(Loan\ Amount_{ijt}) = \alpha + \beta_1 \times Exposure\ to\ AQR_{it} + \beta_2 \times X_{ijt} + \nu_{jt} + \delta_i + \epsilon_{ijt}$$

The key dependent variable is the natural logarithm of the total amount lent by a bank *i* to a firm *j* in the financial year *t*. The observations are at the firm-lender-year level. *Exposure* is defined as the lender's divergence in provisions due to the AQR (as a % of total assets). controls for any time-varying firm-level trend, i.e. any variation in firm-level demand for credit. captures time-invariant lender level effects. are variables controlling for time-varying firm-lender-year level trends. The results are provided below:

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| VARIABLES | Log(Loan Amount) | | | |
| Exposure to AQR (%) | -0.3484*** | -0.2826* | -0.2156** | -0.2899* |
| | (-3.6049) | (-1.7049) | (-2.3061) | (-1.7165) |
| Observations | 167,674 | 167,674 | 167,674 | 167,674 |
| R-squared | 0.3044 | 0.3393 | 0.3118 | 0.3453 |
| Controls | No | No | Yes | Yes |
| FE | Firm X Year | Firm X Year & Lender | Firm X Year | Firm X Year & Lender |
| Clustering | Firm | Lender | Firm | Lender |

Table 8: This table reports the OLS estimates of the equation above. Standard errors are clustered at the firm level in odd-numbered columns and the lender level in even-numbered ones. t-statistics are reported in parentheses. *p<0.1; **p<.05; ***p<0.01. Source: Chopra, Subramanian, and Tantri (2020).

The coefficients come out to be negative and statistically significant. This suggests that higher the exposure of a bank, more is the contraction in its credit supply following the AQR. In terms of the economic magnitude, a one standard deviation increase in the exposure due to the AQR reduces a bank's lending by as much as 4%.

**Impact of lower capital on overall lending and zombie lending:**

The below regression specification from Chopra, Subramanian, and Tantri (2020), looks at the impact of undercapitalization on lending

$$Log\,(Loan\ Amount_{ijt}) = \alpha + \beta_1 \times Exposure\ to\ AQR_{it} + \beta_2 \times Zombie_{(j,t-1)} + \beta_3 \times Capital\ AdequacyRatio_{it} + \beta_4 \times Exposure\ to\ AQR_{it} \times Zombie_{(j,t-1)} + \beta_5 \times Exposure\ to\ AQR_{it} \times CAR_{it} + \beta_6 \times Zombie_{(j,t-1)} \times CAR_{it} + \beta_7 \times Exposure\ to\ AQR_{it} \times Zombie_{(j,t-1)} \times Capital\ AdequacyRatio_{it} + \beta_8 \times X_{ijt} + v_{jt} + \delta_i + epsilon_{ijt}$$

The observations are at a firm-lender-year level. The dependent variable is the natural logarithm of the total amount lent by a lender *i* to a firm *j* in a year *t*. The key independent variables are: (i) Exposure defined as the lender's divergence in provisions due to the AQR (as a % of total assets), (ii) CAR defined as the bank's capital adequacy ratio, and (iii) Zombie defined as an indicator variable that equals one if interest coverage ratio (adjusted for any income from related party transactions) is less than one and zero otherwise in the year t-1. and control for any time-varying firm-level trend and time-invariant lender level effects respectively. are variables controlling for time-varying firm-lender-year level trends.

| VARIABLES | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Log(Loan Amount) | | | |
| Exposure to AQR (%) | -0.6264*** | -0.6476*** | -4.8615*** | -4.8462*** |
| | (-2.6718) | (-2.7588) | (-4.3438) | (-4.5303) |
| Capital Adequacy Ratio | | | 0.0076 | 0.0070 |
| | | | (1.5617) | (1.5173) |
| Exposure to AQR (%) x Capital Adequacy Ratio | | | 0.3763*** | 0.3724*** |
| | | | (3.8534) | (3.9497) |
| Exposure to AQR (%) X Zombie | 0.7216*** | 0.7509*** | 3.9556*** | 3.9325*** |
| | (3.3870) | (3.6242) | (3.3956) | (3.5502) |

| | | | | |
|---|---|---|---|---|
| Capital Adequacy Ratio X Zombie | | | -0.0039 | -0.0036 |
| | | | (-0.7303) | (-0.6736) |
| Exposure to AQR (%) X Capital Adequacy Ratio X Zombie | | | -0.2752*** | -0.2682*** |
| | | | (-3.0560) | (-3.0201) |
| | | | | |
| Observations | 117,827 | 117,827 | 83,977 | 83,977 |
| R-squared | 0.3202 | 0.3265 | 0.3506 | 0.3567 |
| Controls | No | Yes | No | Yes |
| FE | Firm X Year & Lender | | | |
| Clustering | Lender | | | |

Table 9: This table reports the OLS estimates of the impact of AQR on lending. Standard errors are clustered at the lender level and t-statistics are reported in parentheses. *p<0.1; **p<.05; ***p<0.01. Source: Chopra, Subramanian, and Tantri (2020).

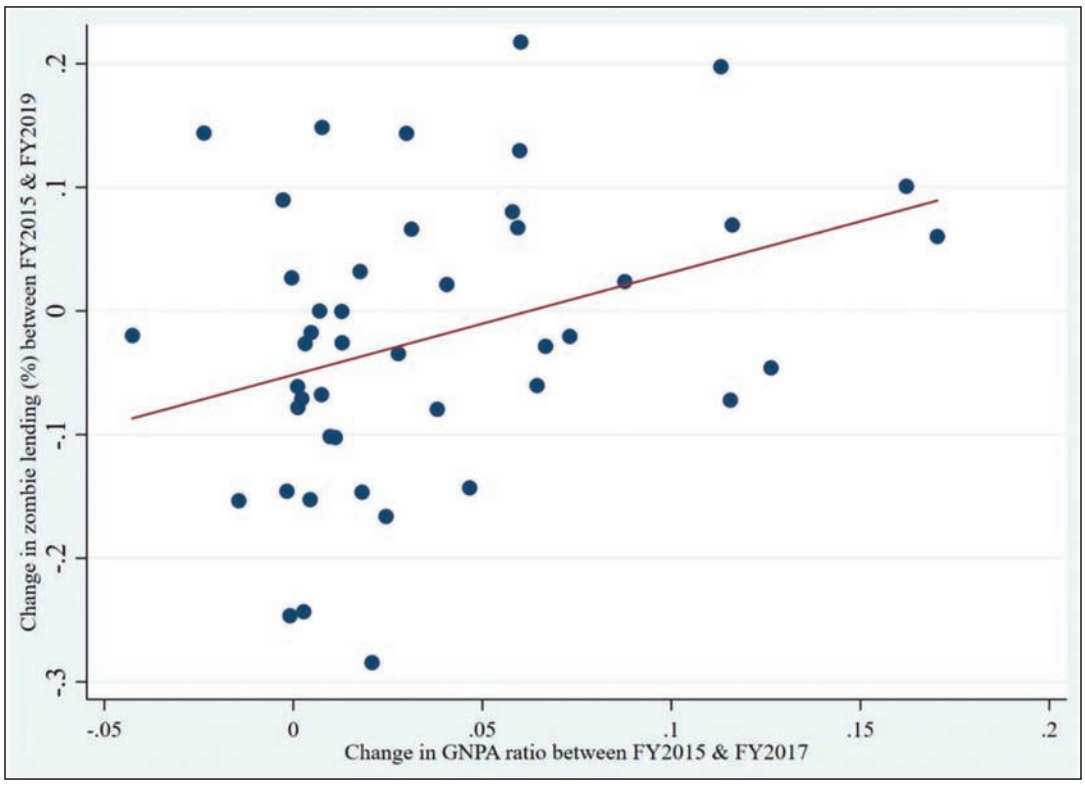
In all the columns of Table 9, we see that the AQR led to a decline in lending as seen in the consistently negative coefficient of the variable Exposure to AQR. In the first two columns, the positive coefficient for the interaction term suggests that while overall lending declined, lending to the zombie firms increased after the AQR; thus, the zombie firms were less impacted by the credit contraction following the AQR.

In columns (3) and (4), the positive coefficient estimate for the interaction between Exposure and Capital Adequacy Ratio suggests that lower capital exacerbated the impact of Exposure to AQR on lending. To see this, note that the marginal impact of Exposure to AQR, which is given by the partial derivative ∂(lending)/∂(Exposure to AQR), equals -4.8 + 3.9* Zombie + 0.38* Capital Adequacy Ratio – 0.27* (Zombie*Capital Adequacy Ratio). As the sign of the coefficient for capital adequacy ratio is positive, this implies that the marginal impact of the AQR on lending was disproportionately greater for banks with a lower capital adequacy ratio. Also, the sign of the interaction term Zombie*Capital Adequacy Ratio in this marginal impact is negative, which implies that the lending declined less for the zombie firms that engaged with undercapitalized banks.

## Decline in Firm's Capital Investment

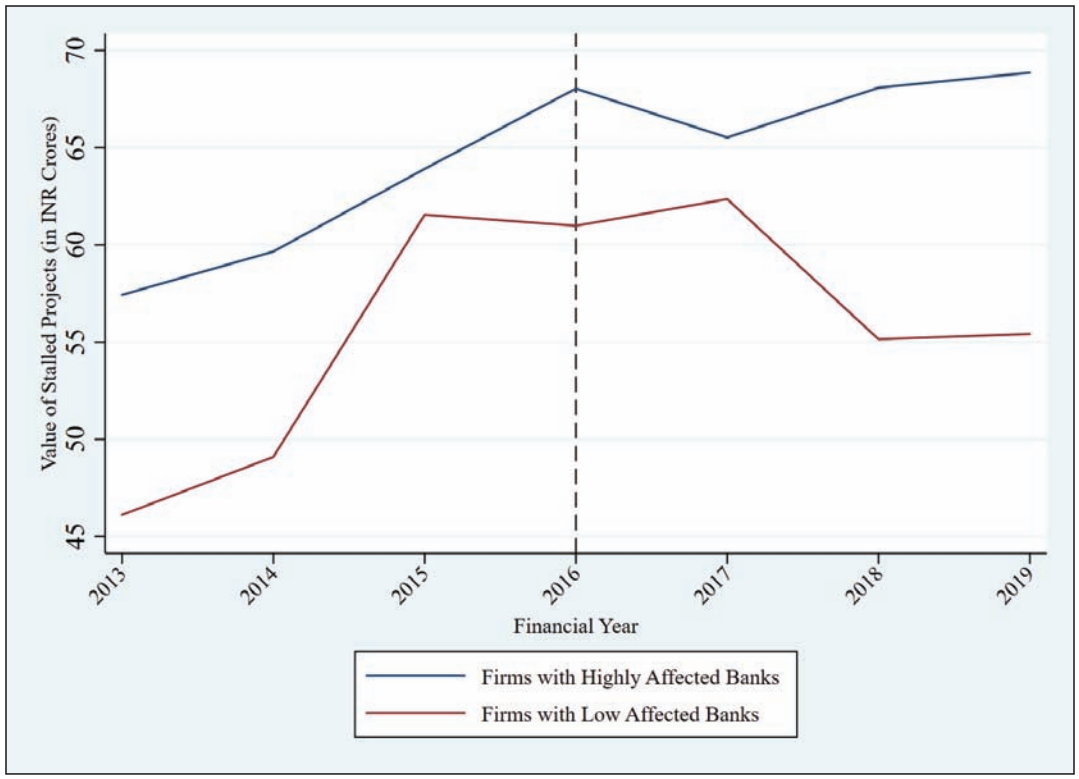
7.40 Banks' tightening of credit supply negatively impacts healthy borrowers as it forces firms to cut down on their investments and capital expenditures. Thus, the likelihood of stalling of ongoing projects increases. Figure 28 plots the value of stalled projects for firms. There is a significant increase in the value of stalled projects following the AQR for firms exposed to banks affected by the AQR when compared to firms that engaged with unaffected banks. Chopra, Subramanian, and Tantri (2020) find that the firms more exposed to the AQR- affected banks could not entirely replace their credit supply from other financial institutions. Thus, these firms became financially constrained and reduced their capital expenditures, leading to ongoing projects being stalled.

**Figure 27: AQR's Impact on Zombie Lending**




Source: CMIE Prowess
Note: Zombie lending measures the proportion of lending to firms with interest coverage of less than one

**Figure 28: Capital Investment of Firms – Value of Stalled Projects**




Source: CMIE Prowess

7.41 In sum, the clean-up of bank balance sheets undertaken under the AQR exacerbated the problems created by the prolonged period of forbearance. In terms of lending, being under-capitalized, banks reduced lending to good borrowers while increasing lending to zombie borrowers. For firms, the reduction in the supply of bank credit reduced their ability to invest. Chopra, Subramanian, and Tantri (2020) compare the AQR with other clean-up programs and point towards the necessity of having an explicit recapitalization program, forced or otherwise, before entering such clean-ups.

## IMPLICATIONS FOR THE CURRENT FORBEARANCE REGIME

7.42 The extensive, careful analysis of the regulatory forbearance and the resulting banking crisis offers key learnings for the current regime of regulatory forbearance following the Covid crisis. Finally:

(a) Remember that forbearance represents emergency medicine that should be discontinued at the first opportunity when the economy exhibits recovery, not a staple diet that gets continued for years. Therefore, policymakers should lay out thresholds of economic recovery at which such measures will be withdrawn. These thresholds should be communicated to the banks in advance so that they can prepare for the same. Prolonged forbearance is likely to sow the seeds of a much deeper crisis. As well, forbearance should be accompanied by restrictions on zombie lending to ensure a healthy borrowing culture.

(b) A clean-up of bank balance sheets is necessary when the forbearance is discontinued. Note that while the 2016 AQR exacerbated the problems in the banking sector, the lesson from the same is not that an AQR should not be conducted. Given the problem of asymmetric information between the regulator and the banks, which gets accentuated during the forbearance regime, an AQR exercise must be conducted immediately after the forbearance is withdrawn.

(c) The asset quality review must account for *all* the creative ways in which banks can ever-green their loans. In this context, it must be emphasized that advance warning signals that do not serve their purpose of flagging concerns may create a false sense of security. The banking regulator needs to be more equipped in the early detection of fault lines and must expand the toolkit of ex-ante remedial measures.

(d) A clean-up unaccompanied by mandatory capital infusion exacerbates bad lending practices. Expecting banks to get recapitalized on their own on account of economic recovery may not be prudent. Therefore, a clean-up exercise should be accompanied by mandatory recapitalization based on a thorough evaluation of the capital requirements post an asset quality review.

(e) Apart from re-capitalizing banks, it is important to enhance the quality of their governance. Ever-greening of loans by banks as well as zombie lending is symptomatic of poor governance, suggesting that bank boards are "asleep at the wheel" and auditors are not performing their required role as the first line of defence. Therefore, to avoid ever-greening and zombie lending following the current round of forbearance banks should have fully empowered, capable boards. Sound governance is a key metric to ensure that banks do not engage in distortionary lending post capital infusion. The regulator may consider penalties on bank auditors if ever-greening is discovered as part of the toolkit of ex-ante measures. This would thereby create incentives for the auditor to conduct the financial oversight more diligently.

(f) While the learnings from the previous episode must be employed to avoid a recurrence, ex-post analysis of complex phenomena must be disciplined by the insights highlighted in Chapter 7 of the Survey. Specifically, to enable policymaking that involves exercise of judgement amidst uncertainty, ex-post inquests must recognise the role of hindsight bias and not make the mistake of equating unfavourable outcomes to either bad judgement, or worse, malafide intent.

(g) Finally, the legal infrastructure for the recovery of loans needs to be strengthened *de facto*. The Insolvency and Bankruptcy Code (IBC) has provided the *de jure* powers to creditors to impose penalties on defaulters. However, the judicial infrastructure for the implementation of IBC – comprised of Debt recovery tribunals, National Company Law Tribunals, and the appellate tribunals must be strengthened substantially.

## CHAPTER AT A GLANCE

- During the Global Financial Crisis, forbearance helped borrowers' tide over temporary hardship caused due to the crisis and helped prevent a large contagion.
- However, the forbearance continued long after the economic recovery, resulting in unintended and detrimental consequences for banks, firms, and the economy.
- Given relaxed provisioning requirements, banks exploited the forbearance window to restructure loans even for unviable entities, thereby windowdressing their books.
- As a result of the distorted incentives, banks misallocated credit, thereby damaging the quality of investment in the economy.
- Forbearance represents emergency medicine that should be discontinued at the first opportunity when the economy exhibits recovery, not a staple diet that gets continued for years
- To enable policymaking that involves an exercise of judgement amidst uncertainty, ex-post inquests must recognise the role of hindsight bias and not make the mistake of equating unfavorable outcomes to either bad judgement, or worse, malafide intent.
- Given the problem of asymmetric information between the regulator and the banks, which gets accentuated during the forbearance regime, an Asset Quality Review exercise must be conducted immediately after the forbearance is withdrawn.
- The legal infrastructure for the recovery of loans needs to be strengthened *de facto*.

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# Innovation: Trending Up but needs thrust, especially from the Private Sector

**08**
**CHAPTER**

எய்தற் கரியது இயைந்தக்கால் அந்நிலையே
செய்தற் கரிய செயல்.

**"If a rare opportunity occurs, while it lasts, let a man do that which is rarely to be accomplished (but for such an opportunity)".**

**— Thirukural, Chapter 49, verse 489.**

*India entered the top 50 innovating countries for the first time in 2020 since the inception of the Global Innovation Index (GII) in 2007, by improving its rank from 81 in 2015 to 48 in 2020. To herald this significant achievement while setting out the path for further progress, the Survey examines India's innovation performance on various dimensions.*

*India ranks first in Central and South Asia, and third amongst lower middle-income group economies. Among the seven pillars of the GII, India ranks 27$^{th}$ in knowledge and technology outputs (KTO); 31$^{st}$ in market sophistication; 55$^{th}$ in business sophistication; 60$^{th}$ in human capital and research (HCR); 61$^{st}$ in institutions; 64$^{th}$ in creative output; and 75$^{th}$ in infrastructure. Among sub-pillars, India ranks tenth in knowledge diffusion and 15$^{th}$ in trade, commerce and market scale. Among parameters, India ranks first in ICT services exports; third in domestic market scale (PPP); ninth in government's online services; ninth in growth rate of productivity; 12$^{th}$ in science and engineering graduates; 13$^{th}$ in ease of protecting minority investors; 15$^{th}$ in e-participation; 16$^{th}$ in average expenditure of top three global R&D companies; and 19$^{th}$ in market capitalisation.*

*India's ranking on innovation outputs improved from 69 in 2015 to 45 in 2020. Its ranking on KTO almost halved from 49 in 2015 to 27 in 2020 while ranking on creative outputs improved from 95 in 2015 to 64 in 2020. India's innovation input sub-index ranking improved from 100 in 2015 to 57 in 2020. This improvement was led by business sophistication, where ranking improved from 116 in 2015 to 55 in 2020. India's ranking on Institutions improved from 104 in 2015 to 61 in 2020. Its ranking on HCR improved from 103 in 2015 to 60 in 2020. Its ranking on market sophistication improved from 72 in 2015 to 31 in 2020. India's ranking on infrastructure improved from 87 in 2015 to 75 in 2020.*

*The GII also highlights areas with scope for improvement. India ranks 107$^{th}$ on education sub-pillar, mainly on account of ranking 118$^{th}$ on pupil-teacher ratio in secondary education; 115$^{th}$ on new business per thousand population in ages 15-64; 108$^{th}$ on tertiary*

*inbound mobility; 108th on ICT access as well as ICT use; 105th on ease of starting a business; and 101st on females employed with advanced degrees. Also, as the 5th largest economy, India's aspiration must be to compete on innovation with the top ten economies.*

*The business sector in India contributes much less to gross expenditure on R&D (about 37 per cent) when compared to businesses in each of the top ten economies (68 per cent on average). This is despite the fact the tax incentives for R&D were more liberal in India when compared to those in the top ten economies. The Government does a disproportionate amount of heavy-lifting on R&D by contributing 56 per cent of the gross expenditure on R&D, which is three times the average contributed by governments in the top ten economies. Yet, India's gross expenditure on R&D at 0.65 per cent of GDP is much lower than that of the top 10 economies (1.5-3 per cent of GDP) primarily because of the disproportionately lower contribution from the business sector. Indian government sector contributes the highest share of total R&D personnel (36 per cent) and researchers (23 per cent) amongst the top ten economies (nine per cent on average). Indian business sector's contribution to the total R&D personnel (30 per cent) and researchers (34 per cent) in the country is the second lowest amongst the top ten economies (over 50 per cent on average). Indian residents contribute only 36 per cent of patents filed in India as compared to 62 per cent on average in the top ten economies. Indian firms also perform below expectation on innovation for their level of access to equity finance, which is the most crucial for innovation.*

*India must significantly ramp up investment in R&D if it is to achieve its aspiration to emerge as the third largest economy in terms of GDP current US$. Mere reliance on "Jugaad innovation" risks missing the crucial opportunity to innovate our way into the future. This requires a major thrust on R&D by the business sector. India's resident firms must increase their share in total patents to a level commensurate to our status as the fifth largest economy in current US$. India must also focus on strengthening institutions and business sophistication to improve its performance on innovation outputs.*

*As Economic Survey 2019-20 discussed in the chapter "Entrepreneurship and Wealth Creation at the Grassroots", the Startup India campaign of the Government of India recognises entrepreneurship as an increasingly important strategy to fuel productivity growth and wealth creation in India. This assumes greater importance in the context of enhancing private participation in innovation in India - in terms of contribution to gross expenditure on R&D, R&D personnel and researchers, and share in patents filed in the country. The lessons drawn therein on the crucial role of literacy, education, physical infrastructure and policies enabling ease of doing business, as drivers of new firm creation and entrepreneurship, remain relevant in this analysis.*

## WHY INNOVATION MATTERS

8.1 A vast body of literature in economics extols the role of innovation and technological progress in growth and development. Box 1 presents a selective review of literature highlighting the importance of innovation.

## Box 1: Literature on Innovation, R&D and Growth

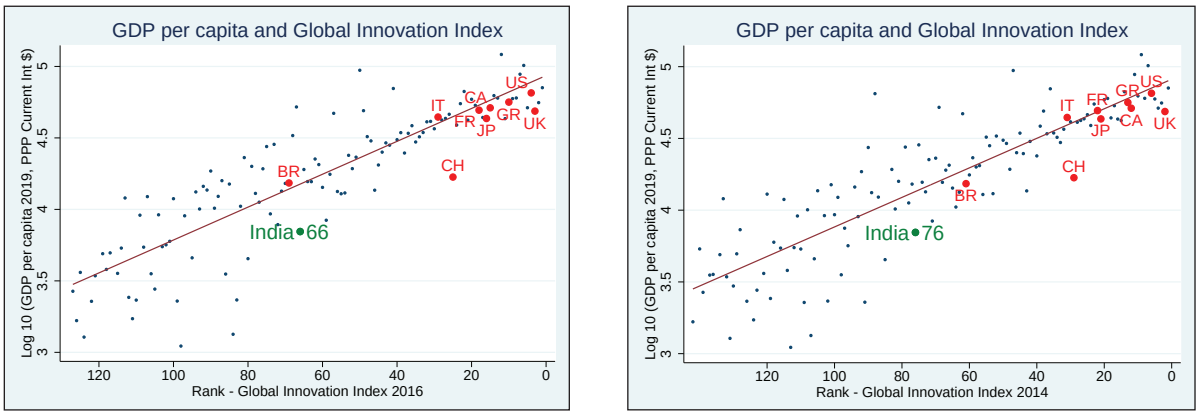
The importance of technological progress in economic growth began with the Solow model (Solow 1956), which highlighted that output per worker mainly depends on savings, population growth and technological progress. This model was empirically extended by Barro (1991); Barro and Sala-i-Martin (1991, 1992), and Mankiw, Romer and Weil (1992), identifying technological progress as the key determinant of long-term economic growth.

While the Solow model treats technological progress as exogenous, the new growth theory endogenises technological progress and suggests several determinants of the same. These include human capital (Lucas, 1988); search for new ideas by profit-oriented researchers (Romer, 1990); infrastructure (Aschauer 1989); and improving quality of existing products (Grossman and Helpman 1991; Aghion and Howitt 1992). Endogenous growth has also been explained using the Shumpeterian model of creative destruction, where innovative products brought to the market by entrants lead to replacement/ destruction of the old ones produced by the incumbents (Aghion, Akcigit, & Howitt, 2013).

The relation between innovation and research sector received attention with endogenous growth models (Romer, 1990 and Aghion & Howitt, 1992). Some postulated that R&D activities could make long run growth possible (Jones, 1995) and R&D effects on aggregate production functions were tested (Sveikauskas, 2007). Research showed that small enterprise R&D activities brought large returns to the national economy through new technologies (Comin, 2004). More recently, studies have focused on patenting and economic growth (Westmore, 2013; Acharya and Subramanian, 2009, Acharya et al. 2013). Studies have also established a relationship between entrepreneurship innovation and economic growth (Galindo & Méndez, 2014). An increase of 10 per cent in R&D investment has been associated with productivity gains ranging from 1.1 per cent to 1.4 per cent (Donselaar and Koopmans, 2016).

**Figure 1: Positive Correlation between GDP per capita (2019) and Past Innovation**

**A) Innovation (2016)** **B) Innovation (2014)**




Source: The World Bank and Global Innovation Index database
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.2 The positive correlation between past innovation performance and current GDP per capita can be examined empirically. Figure 1 shows the positive correlation between past innovation performance (three-years ago in 2016 and five years ago in 2014) with GDP per capita in PPP

terms (2019) across countries. It may be seen that India has performed below expectation for its past innovation performance in terms of recent GDP per capita.

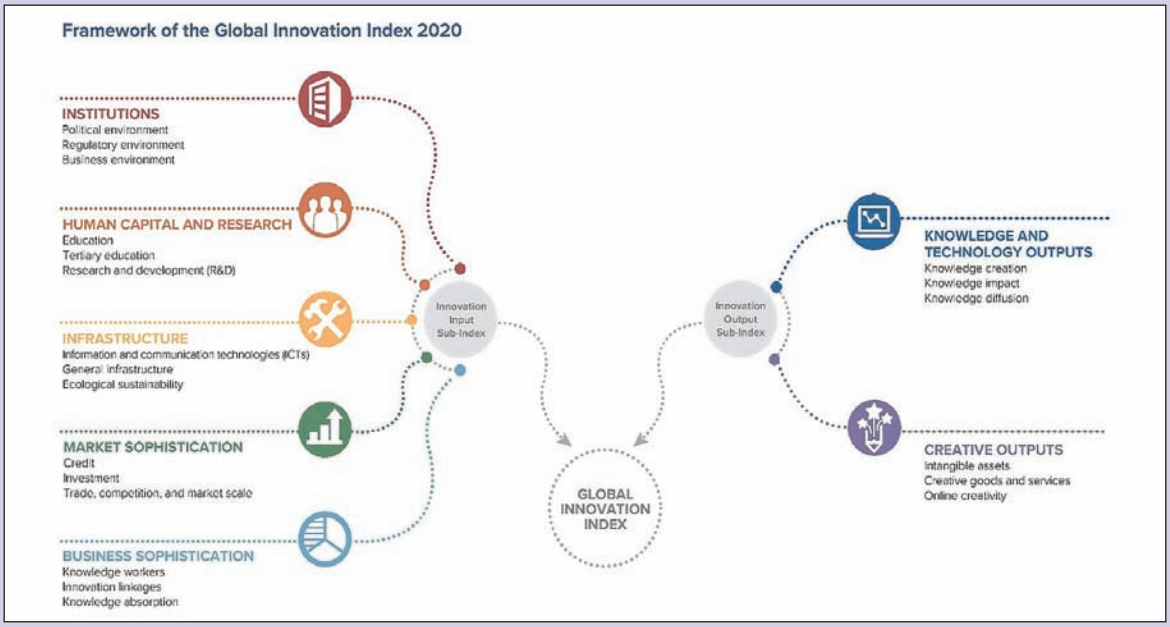
## HOW DOES INDIA PERFORM ON INNOVATION?

8.3 India ranks 48th amongst 131 countries in terms of its innovation performance as measured using the Global Innovation Index (GII) 2020. See Box 2 for a description of the GII, which is further sub-divided into the innovation output sub-index and innovation input sub-index. India ranks 45th and 57th on the output and input sub-indices respectively. India entered the top 50 innovating countries for the first time since the inception of the index in 2007. Along with three other economies – Vietnam, Republic of Moldova and Kenya, India has the rare distinction of being an innovation achiever for ten consecutive years.

### Box 2: The Global Innovation Index (GII)

The GII is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. It seeks to assist economies in evaluating their innovation performance.

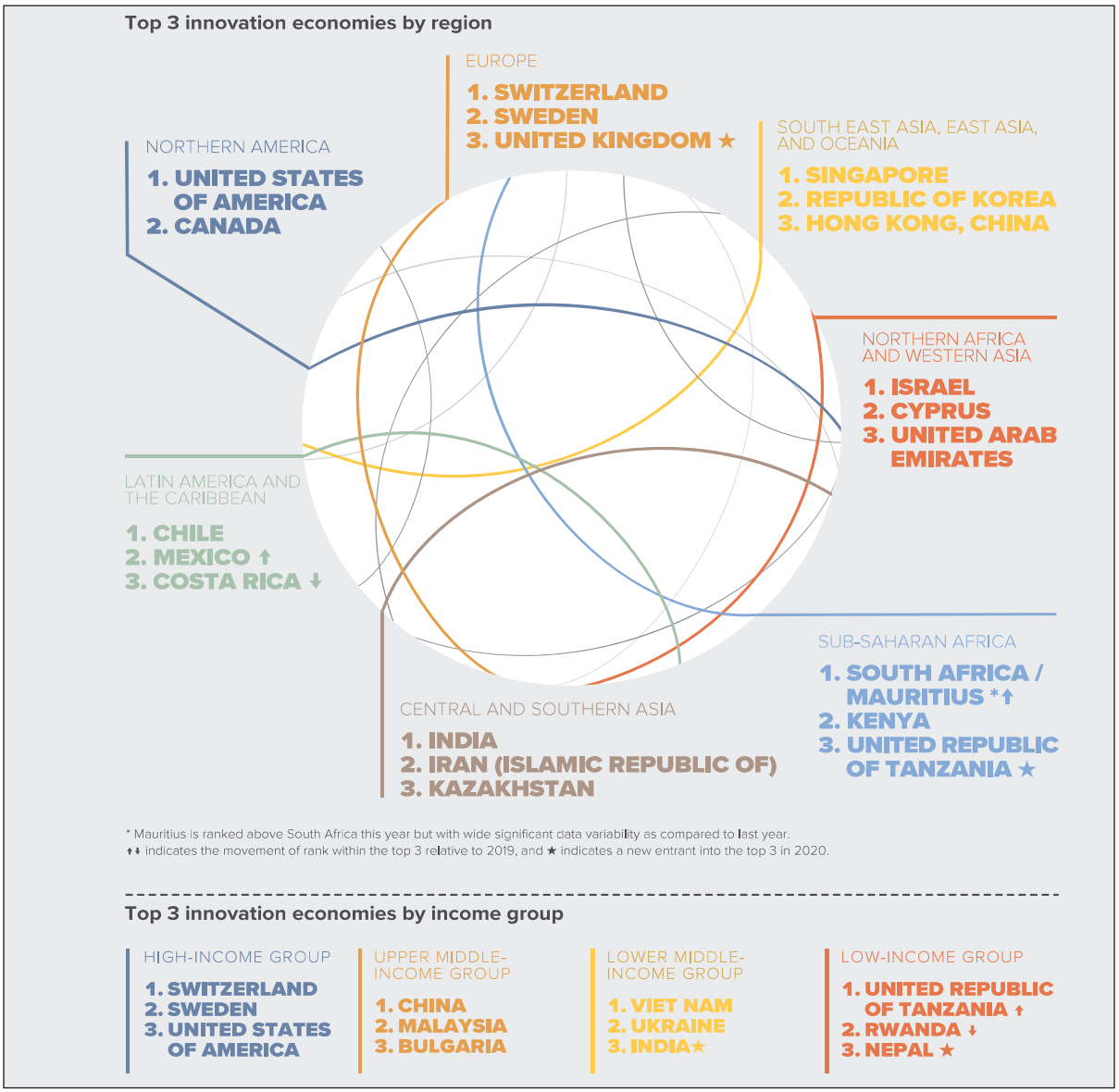
GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each consisting of three sub-pillars, further divided into a total of 80 indicators. The Innovation Input sub-index and the Innovation Output Sub-Index have equal weight in calculating the overall GII. The Innovation Input sub-index has five pillars: (i) Institutions; (ii) Human Capital and Research; (iii) Infrastructure; (iv) Market Sophistication; and (v) Business Sophistication. The Innovation Output Sub-Index has two pillars (i) Knowledge and Technological outputs and (ii) Creative outputs. GII was first conceptualised in 2007.




Source: GII

GII 2020 includes 131 countries/economies, which represent 93.5 per cent of the world's population and 97.4 per cent of the world's GDP in purchasing power parity current international dollars.

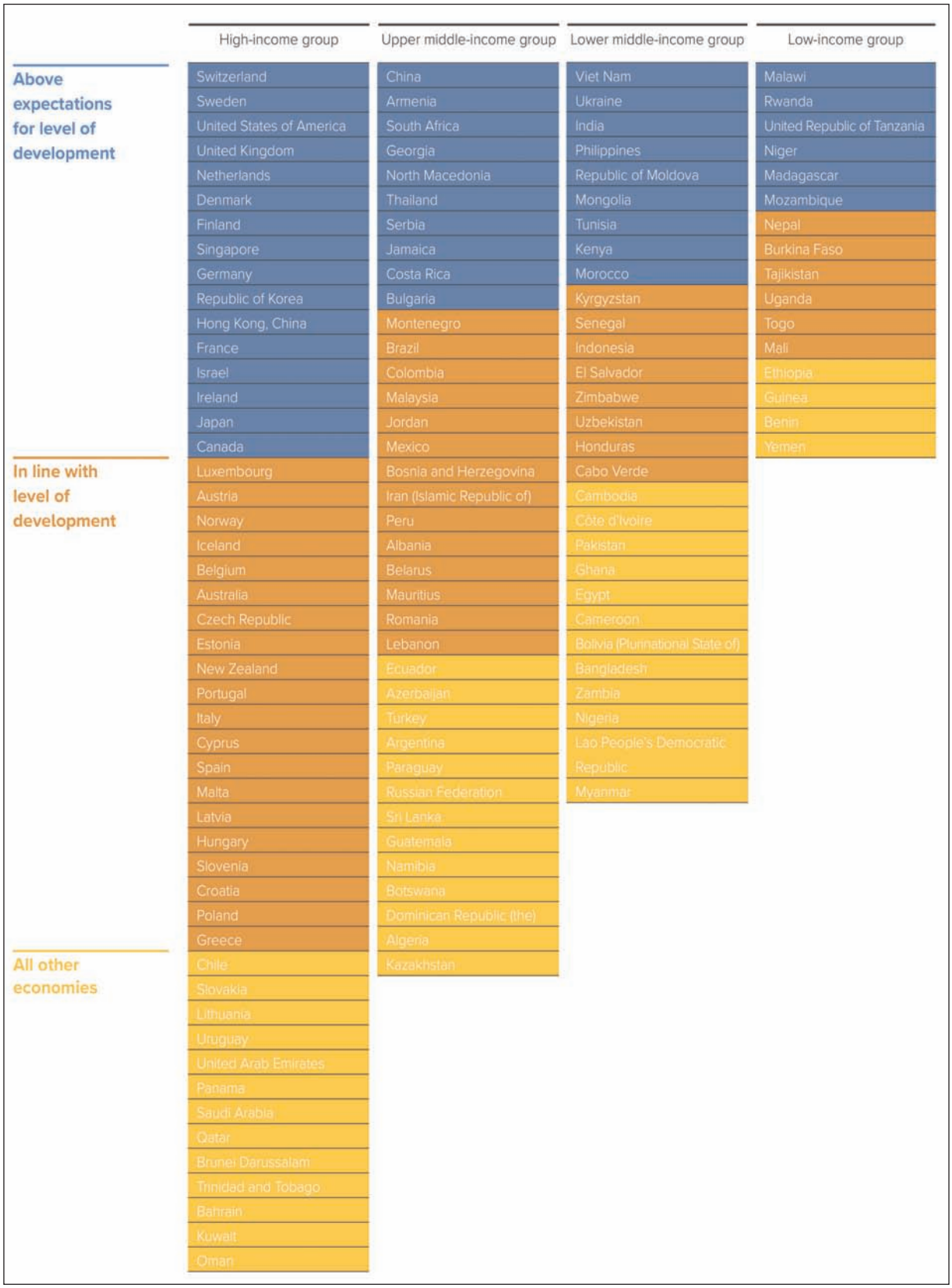
**Figure 2: Global Leaders in Innovation in 2020**




Source: GII 2020 Report

8.4 India performed particularly well regionally and in its income category, ranking first in the GII rankings in Central and South Asia, and third amongst lower middle-income group economies (see Figure 2). India performed above expectation for its level of development in terms of innovation (see Figure 3).

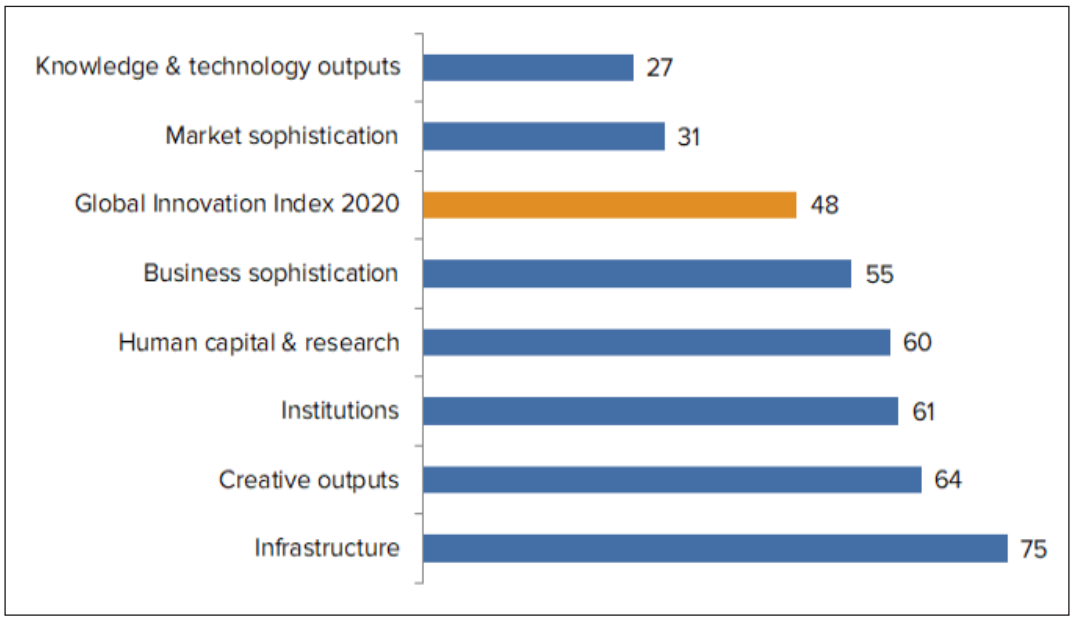
**Figure 3: Innovation Performance by Income-level in 2020**




Source: GII 2020 Report

8.5 Figure 4 shows India's performance on the GII 2020 (rank) across the seven pillars. India performed best on the knowledge & technology outputs (KTO) pillar (rank 27) followed by Market Sophistication pillar (rank 31). India performed lowest on the Infrastructure pillar (rank 75).

**Figure 4: India's performance on pillars of the Global Innovation Index 2020 (rank)**



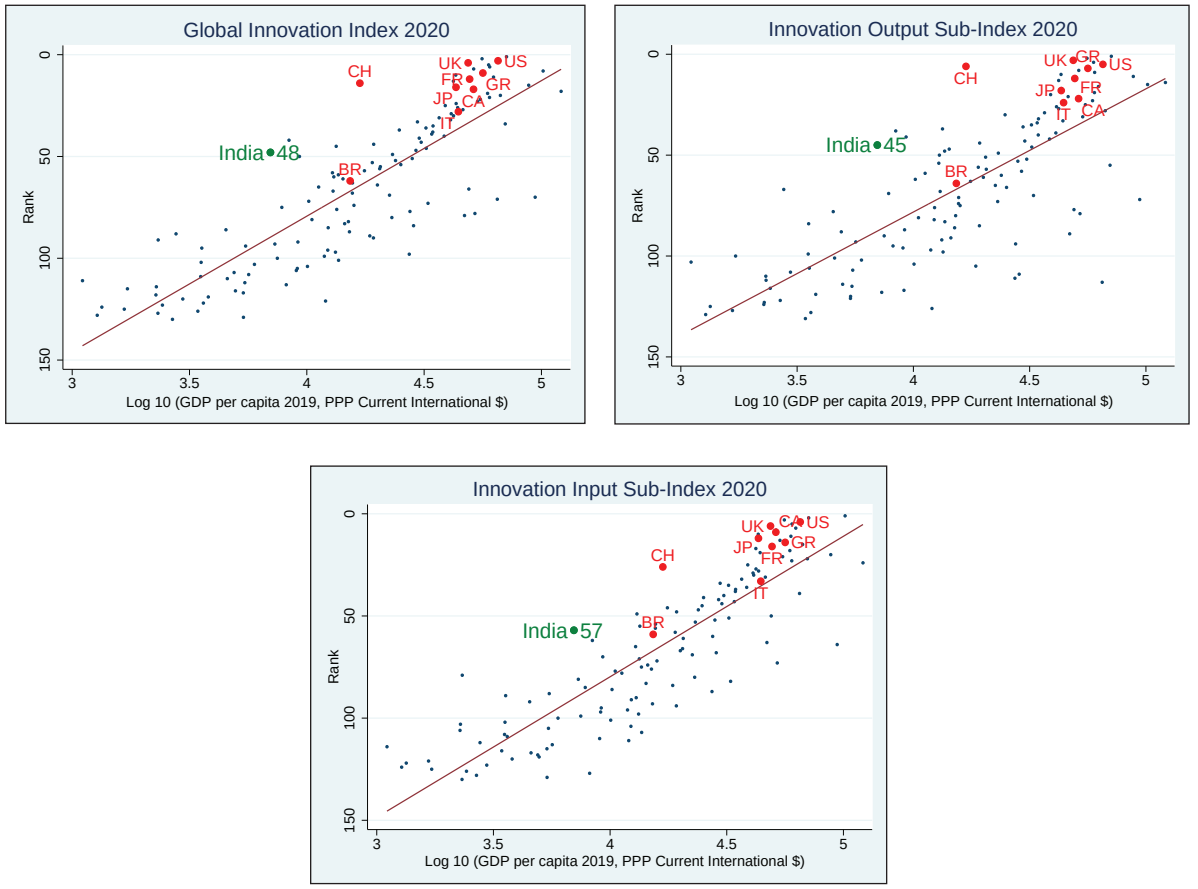

Source: GII 2020 Report

8.6 India's performance in innovation outputs is driven by its competencies. India ranks tenth in the Knowledge Diffusion sub-pillar of the KTO pillar. India's first rank in the Information and Communications Technology (ICT) services exports as per cent of total trade shows its leadership in the global ICT services industry. India ranks ninth in terms of productivity growth (growth rate of GDP PPP per worker). It is ranked 21st for citable documents as well as cultural and creative services exports. India has the distinction of ranking 31st in global brand value by producing many more valuable brands than expected for its income level.

8.7 India has performed impressively in innovation inputs such as domestic market scale (rank three) facilitating its overall rank of 15 in the Trade, Competition and Market Scale sub-pillar. Other leading innovation inputs for India include government's online service (rank nine), graduates in science and engineering (rank 12), ease of protecting minority investors (rank 13), e-participation (rank 15), average exports of top three global R&D companies (rank 16) and average score of top 3 universities in the QS university rankings (rank 22).

8.8 Figure 5 takes a closer look at India's performance on the GII and its sub-indices vis-à-vis the top 10 economies in terms GDP (Current US$). India performs above expectation for its level of development (per capita GDP) on the GII as well as the Innovation Output and Innovation Input sub-indices.

**Figure 5: Innovation and Level of Development**




Source: The World Bank and GII database
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

## Is India a positive outlier only because of its population?

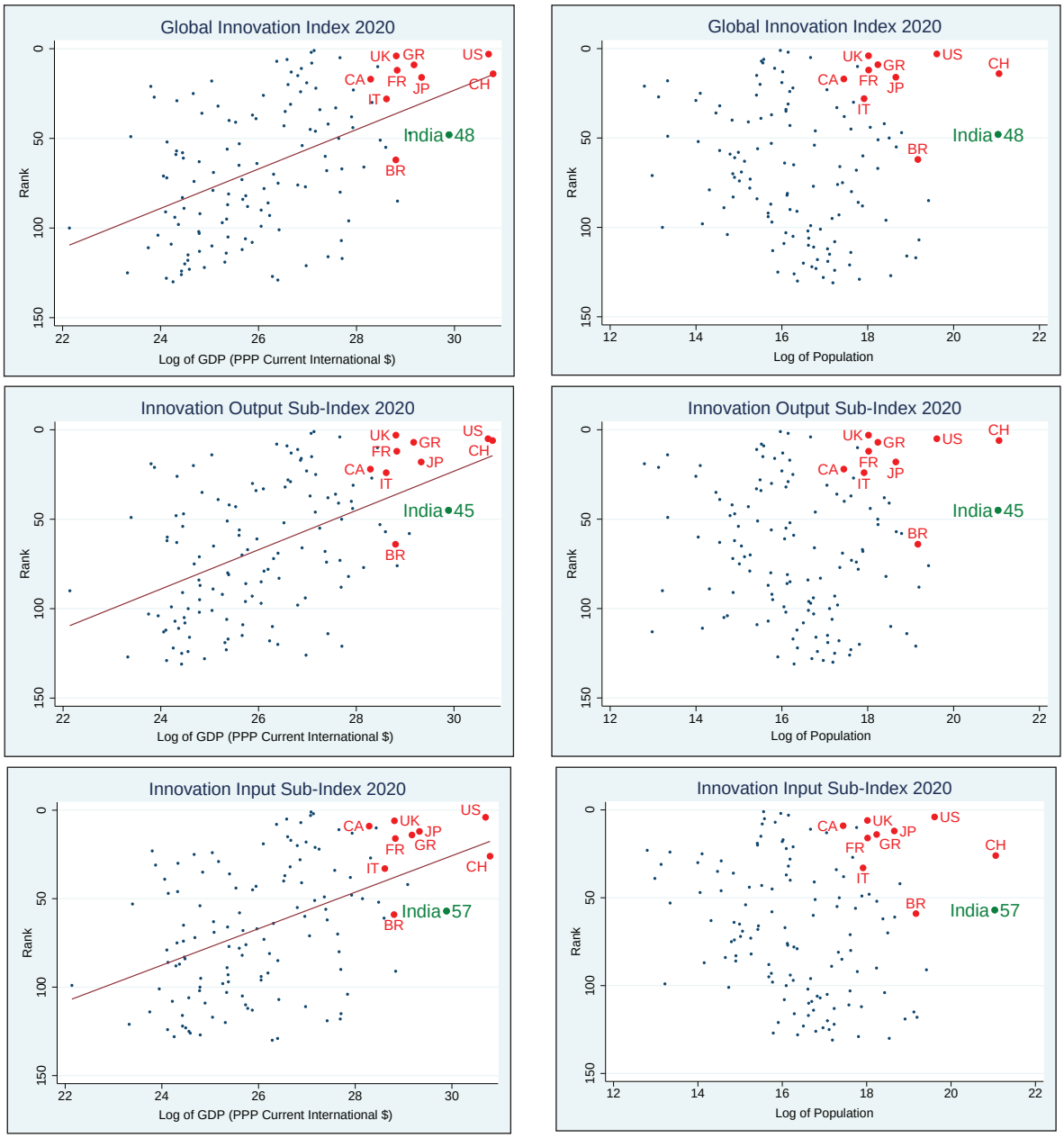
8.9 India is an innovation outlier in terms of its level of development (per capita GDP in PPP terms). India is the third largest economy globally in PPP terms and the second largest in terms of population. Since per capita income is a function of the population, we examine whether India is a positive outlier because of high population.

8.10 Figure 6 sheds light on this issue. It plots GII rank, Innovation Outputs rank and Innovation Inputs rank against log GDP PPP and log population. The top 10 economies (GDP current US$) are highlighted on the graphs. It may be seen that population does not seem to be correlated to GII, Innovation Outputs and Innovation Inputs. However, GDP seems to be positively correlated with innovation performance. Figure 6 suggests that India's status as an innovation outlier w.r.t. its level of development cannot be attributed to its population as we observe no clear pattern of correlation between innovation performance and population.

8.11 Figure 6 also suggests that India is a negative outlier in terms of its GDP, i.e. India seems to be underperforming in innovation w.r.t. the size of its GDP. This divergent performance for India in terms of the size of its economy and its level of development is a significant finding and warns against being complacent.

**Figure 6: Performance on GII w.r.t GDP and Population**

**A) GDP** **B) Population**




Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

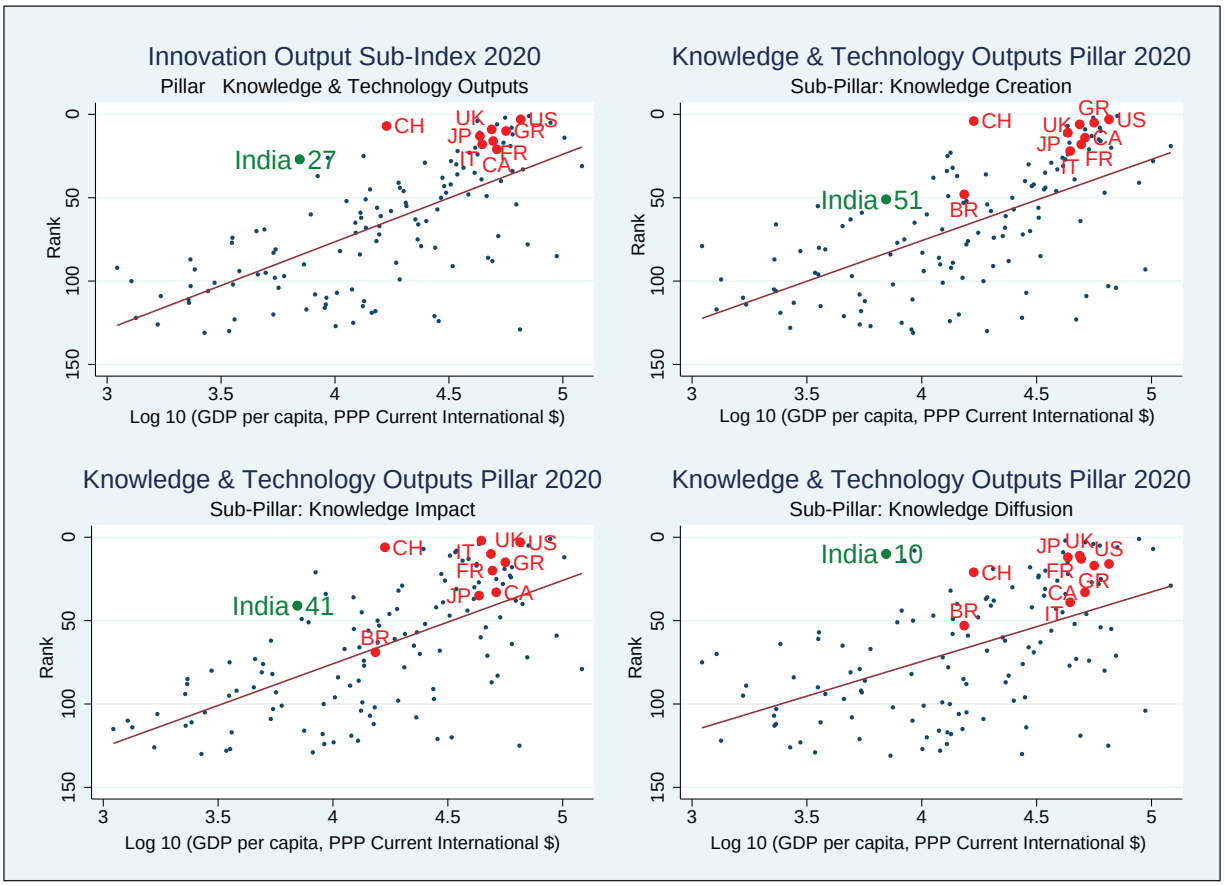
## India's performance on sub-components of the Global Innovation Index 2020

8.12 Figures 7-13 examine India's innovation performance (rank) vis-à-vis its level of development (per capita GDP) for the seven pillars and 21 sub-pillars of the GII. India is a positive outlier on most pillars and sub-pillars of the GII w.r.t. its level of development.

8.13 Figure 7 depicts India's performance in its best performing pillar - KTO pillar and its three sub-pillars – knowledge creation, knowledge impact and knowledge diffusion vis-à-vis its level

of development. In 2020, India performed above expectation for its level of development in all three sub-pillars of the KTO pillar. It performed particularly well in knowledge diffusion sub-pillar (rank ten), which can be mainly attributed to its performance in the parameter ICT services exports as per cent of total trade, in which India ranked first globally. In the knowledge impact sub-pillar (rank 41), India's performance was led by the parameter growth rate of GDP PPP$ per worker (rank nine).

**Figure 7: India's performance in Knowledge & Technology Pillar in GII 2020**

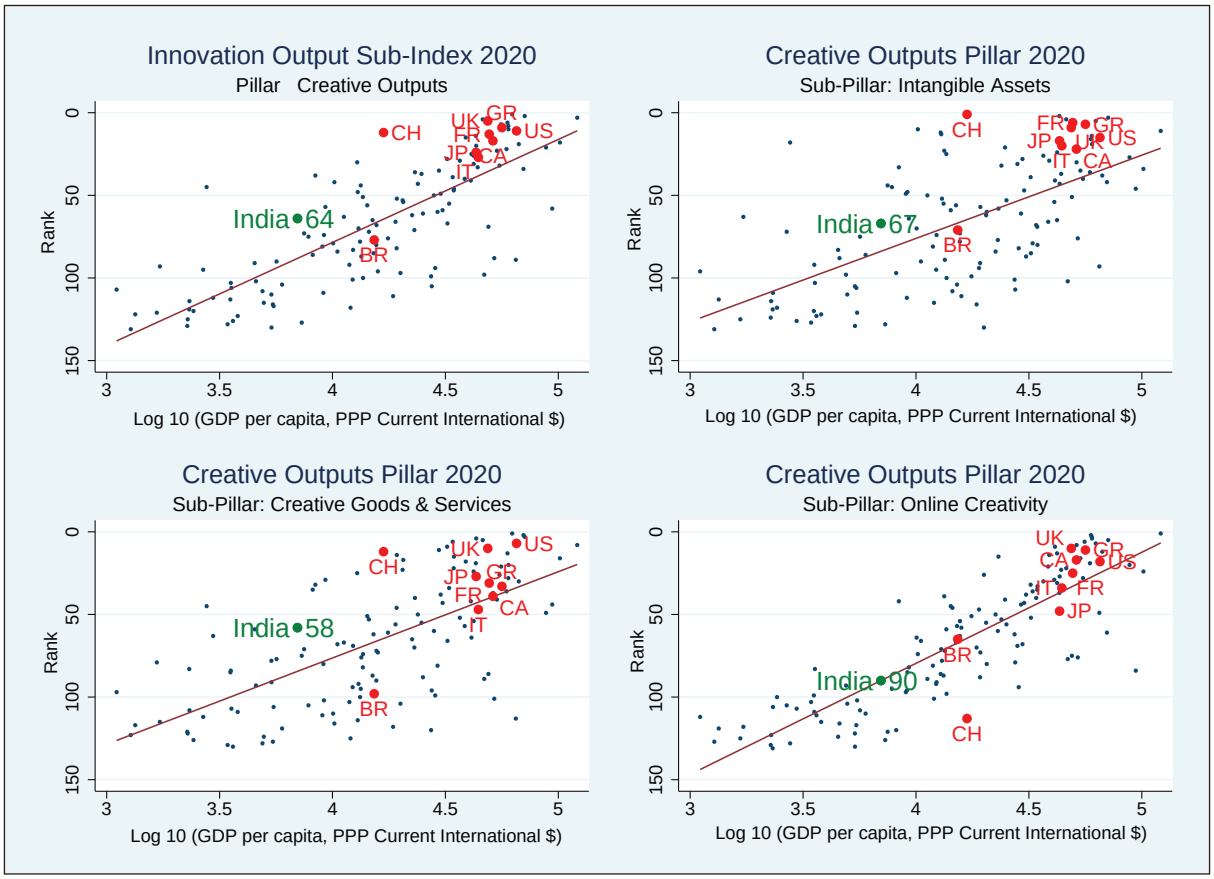



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.14 Figure 8 shows India's performance in the creative outputs pillar and its three sub-pillars – intangible assets, creative goods & services and online creativity vis-à-vis its level of development. In 2020, India performed above expectation for its level of development in two sub-pillars of the creative outputs pillar. It performed better in creative goods & services (rank 58) and intangible assets (rank 67) pillar than online creativity (rank 90). Performance in creative goods & services sub-pillar was led by the parameters cultural & creative services exports as per cent of total trade (rank 21) and creative goods exports as per cent of total trade (rank 23). Performance in intangible assets sub-pillar was led by the parameter global brand value, top 5000 as per cent of GDP (rank 31).

**Figure 8: India's performance in Creative Outputs Pillar in GII 2020**

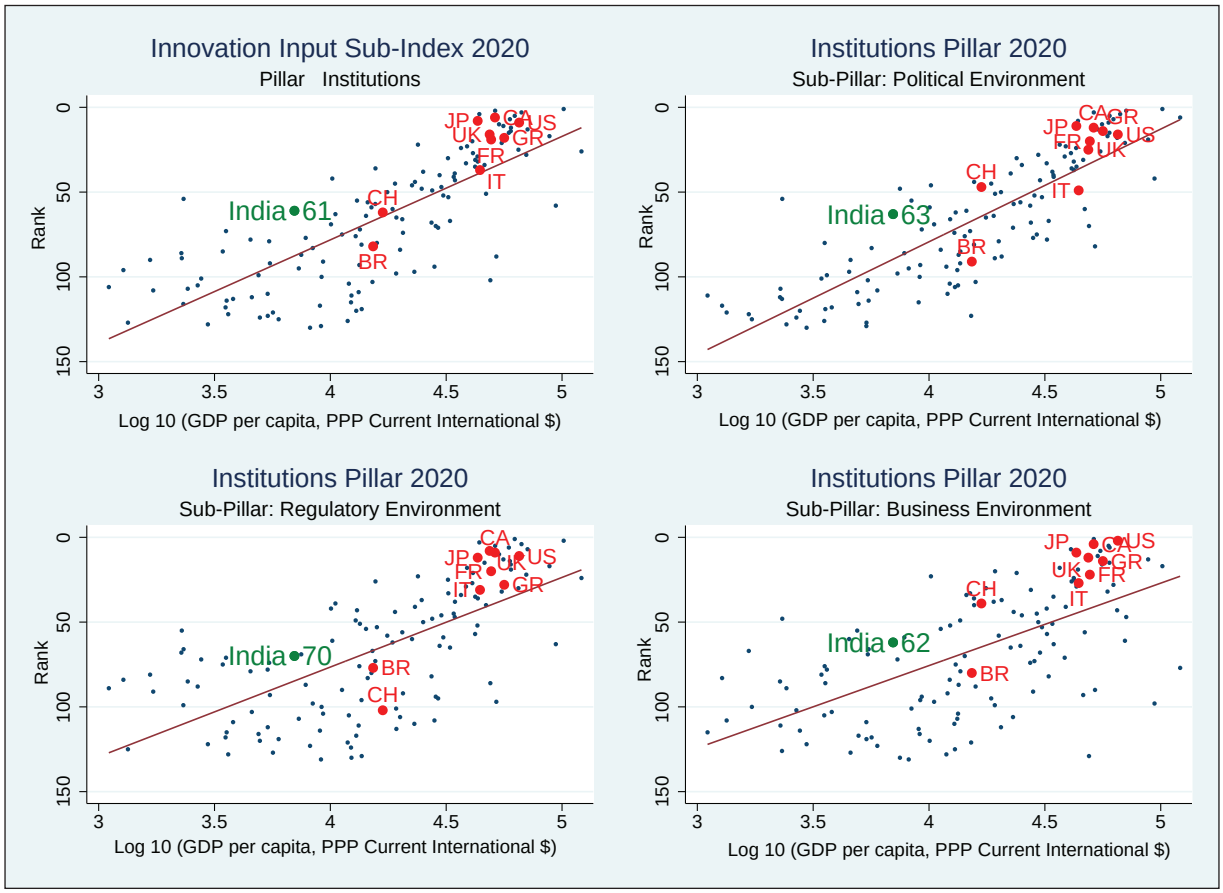



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.15 Figure 9 shows India's performance in the institutions pillar and its three sub-pillars – political environment, regulatory environment and business environment vis-à-vis its level of development. India performed above expectation for its level of development in all three sub-pillars of the institutions pillar in 2020. It performed better in business environment (rank 62) and political environment (rank 63) than in regulatory environment (rank 70), taking its overall institutions ranking to 61.

**Figure 9: India's performance in Institutions Pillar in GII 2020**

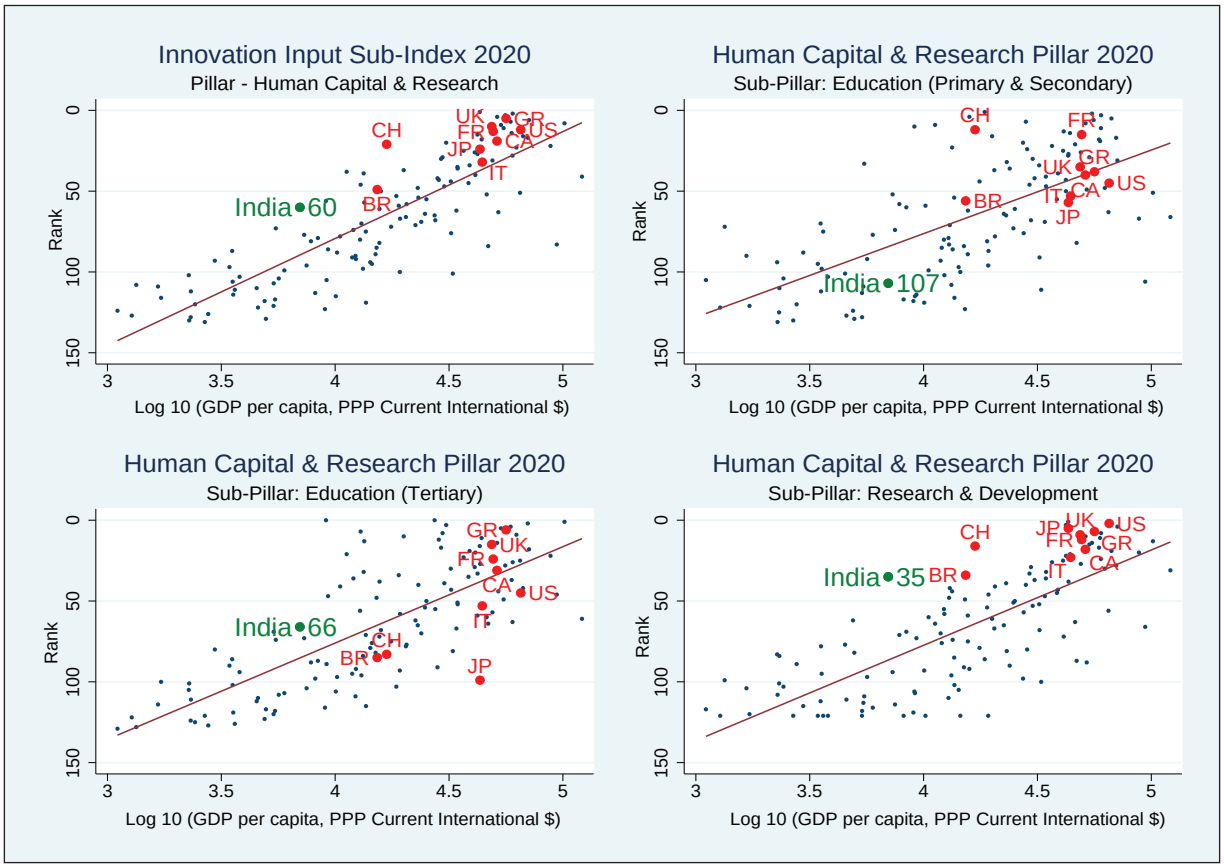



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.16 Figure 10 shows India's performance in the Human Capital & Research (HCR) pillar and its three sub-pillars – primary and secondary education, tertiary education and research & development vis-à-vis its level of development. India performed above expectation for its level of development in two sub-pillars (tertiary education and R&D) of the HCR pillar in 2020, performing particularly well in R&D (rank 35). It performed below expectation for its level of development in the primary & secondary education sub-pillar (rank 107), which is mainly attributed to India's poor performance in pupil-teacher ratio in secondary education (rank 118).

**Figure 10: India's performance in Human Capital & Research Pillar in GII 2020**

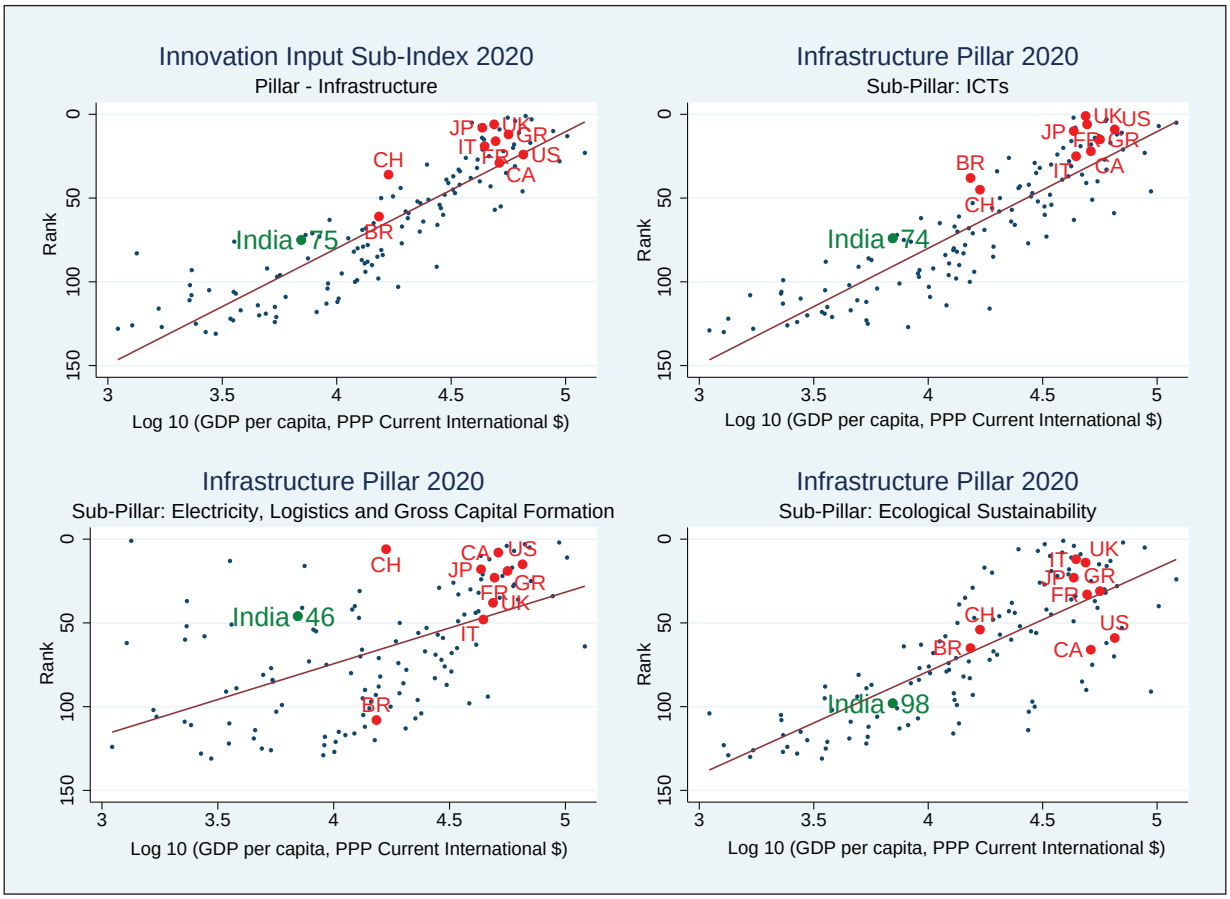



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.17 Figure 11 shows India's performance in the infrastructure pillar and its three sub-pillars – ICT; electricity, logistics and gross capital formation (GCF); and ecological sustainability vis-à-vis its level of development. India performed above expectation for its level of development in two sub-pillars of the infrastructure pillar in 2020, performing well in the electricity, logistics and GCF sub-pillar (rank 46). Its performance in the electricity, logistics and GCF sub-pillar was led by the parameter gross capital formation as per cent of GDP (rank 24). India's performance in the ICT sub-pillar was led by government's online services (rank 9) and e-participation (rank 15) but dragged down by ICT access (rank 108) and ICT use (rank 108). India performed below expectation for its income level in the ecological sustainability sub-pillar (rank 98), which can be mainly attributed to the parameter environmental performance (rank 124).

**Figure 11: India's performance in Infrastructure Pillar in GII 2020**

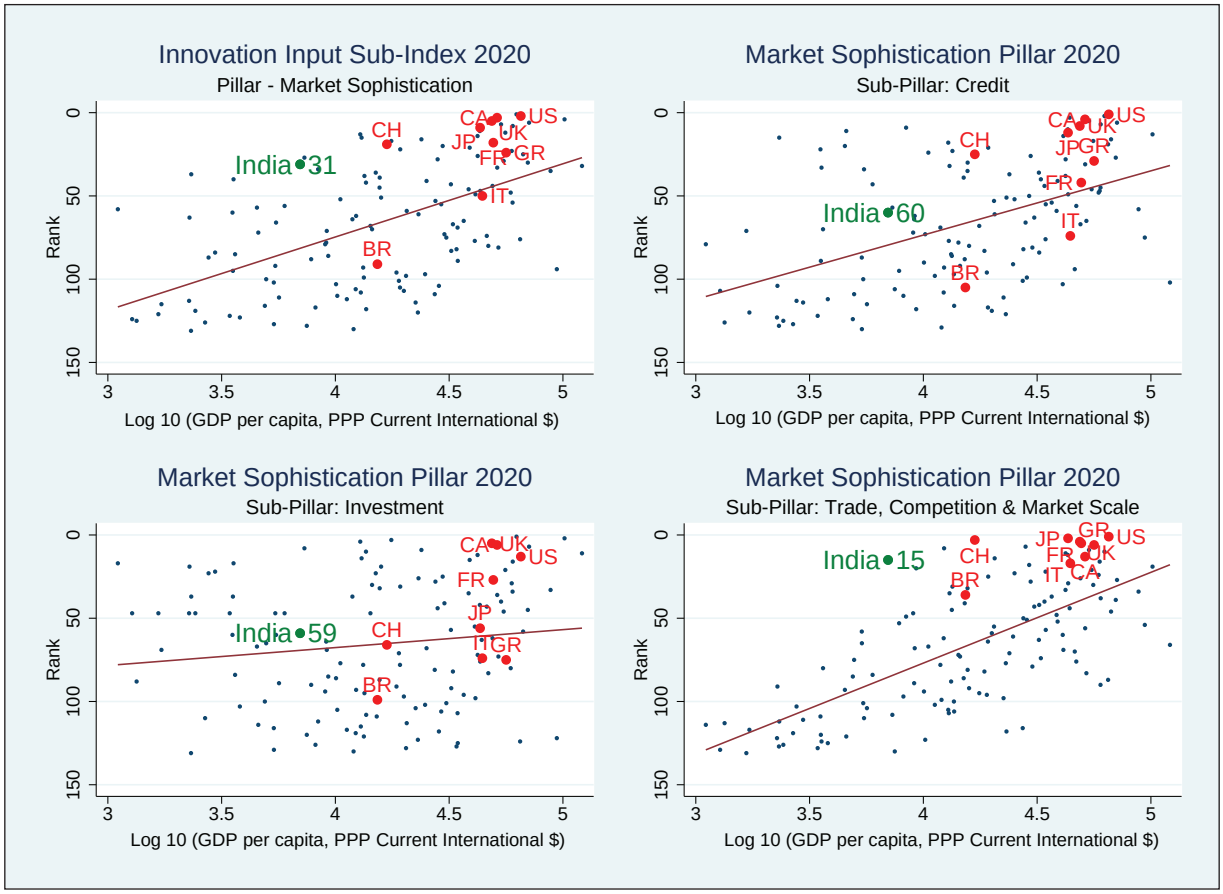



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.18 Figure 12 examines India's performance in the market sophistication pillar and its three sub-pillars – credit, investment and trade, competition and market scale vis-à-vis its level of development. India performed above expectation for its level of development in all three sub-pillars of the market sophistication pillar in 2020, performing particularly well in trade, competition and market scale sub-pillar (rank 15). This was driven by the parameter domestic market scale in which India ranked third globally. India's performance in investment sub-pillar was driven by the parameters ease of protecting minority investors (rank 13) and market capitalisation as per cent of GDP (rank 19). India's performance in credit sub-pillar was driven by the parameters ease of getting credit (rank 23) and microfinance gross loans as per cent of GDP (rank 25).

**Figure 12: India's performance in Market Sophistication Pillar in GII 2020**

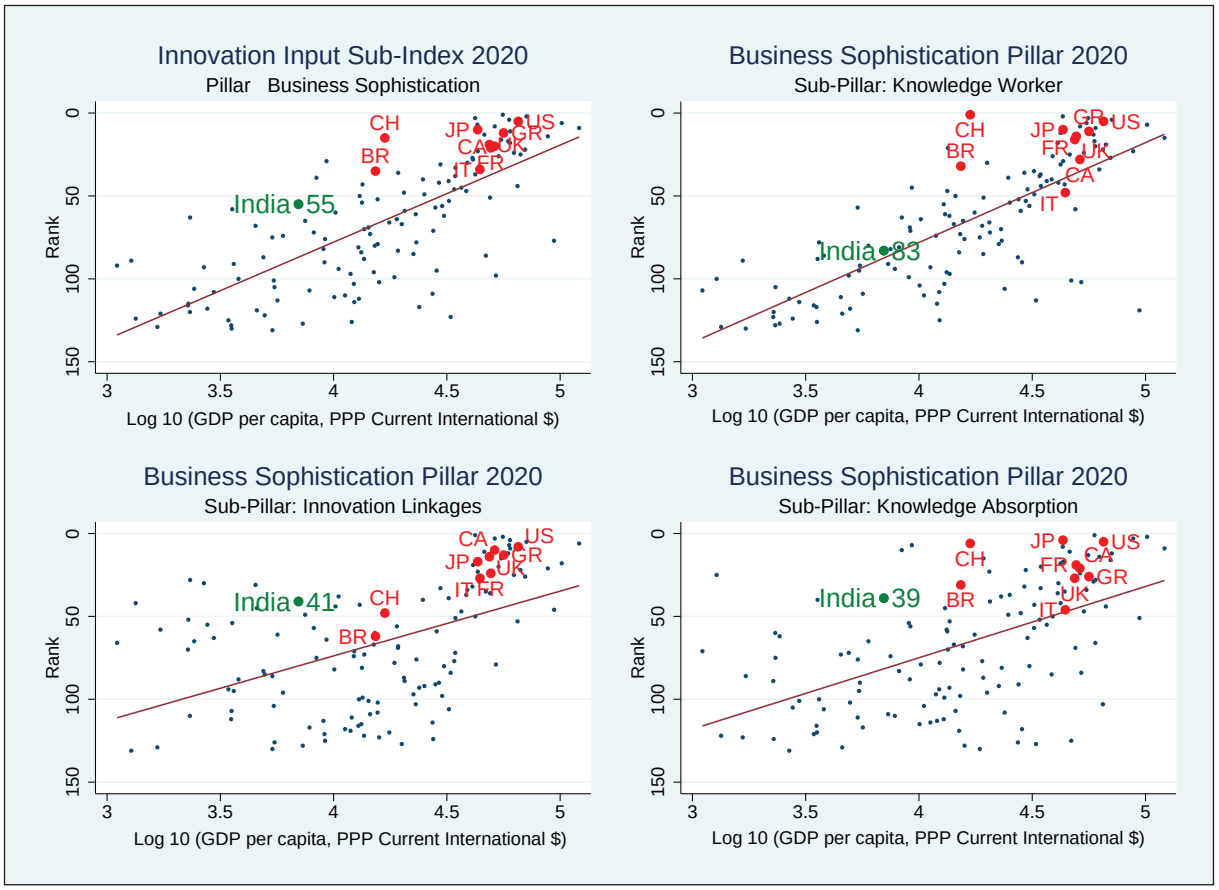



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.19 Figure 13 examines India's performance in the business sophistication pillar and its three sub-pillars – knowledge worker, innovation linkages and knowledge absorption vis-à-vis its level of development. India performed above expectation for its level of development in two sub-pillars of the business sophistication pillar in 2020 – knowledge absorption (rank 39) and innovation linkages (rank 41). Its performance in knowledge absorption sub-pillar was led by the parameters intellectual property payments as per cent of total trade (rank 27) and high-tech imports as per cent of total trade (rank 29). India's relatively poor performance in knowledge workers sub-pillar can be mainly attributed to its low performance in the parameter females employed with advanced degrees (rank 101), followed by the parameter knowledge-intensive employment (rank 90).

**Figure 13: India's performance in Business Sophistication Pillar in GII 2020**




Source: The World Bank and GII database

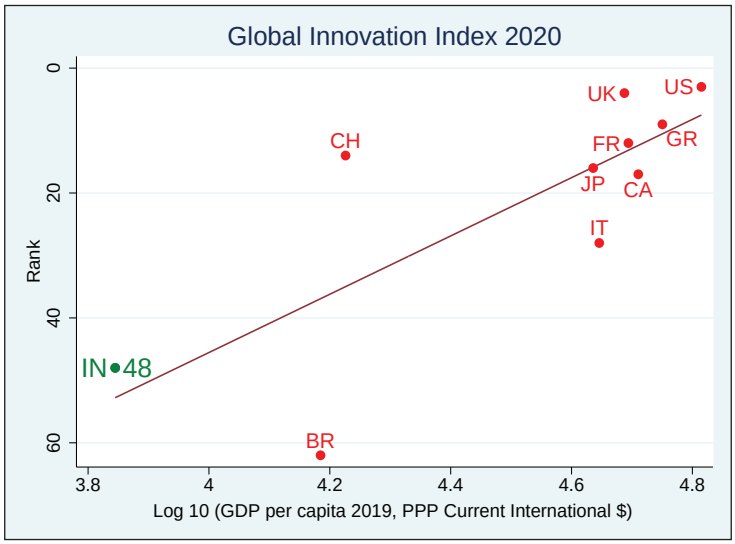
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

## INDIA'S INNOVATION PERFORMANCE VIS-À-VIS TOP TEN ECONOMIES

8.20 India is currently the fifth largest economy in terms of GDP current US$ while it is the third largest in terms of GDP PPP current international $. Although India has performed above expectation on innovation w.r.t. its level of development, India lags behind most other large economies (top ten in terms of GDP current US$) on most indicators of innovation.

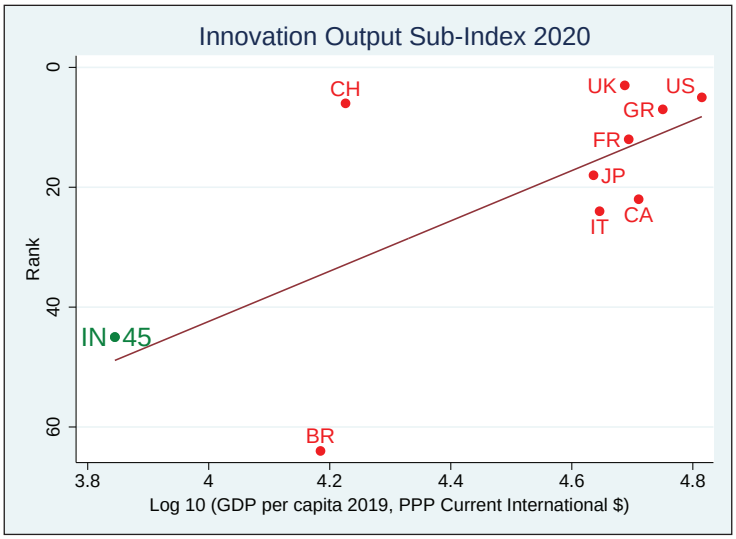
8.21 Figure 14 shows GII performance of the ten largest economies (GDP current US$). Although India performs in line with its level of development, India ranks second lowest, after Brazil, on the overall GII. Countries such as China and the UK rank much higher than expected for their level of development.

**Figure 14: Performance of Top 10 Economies on GII**




Source: The World Bank and GII database
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

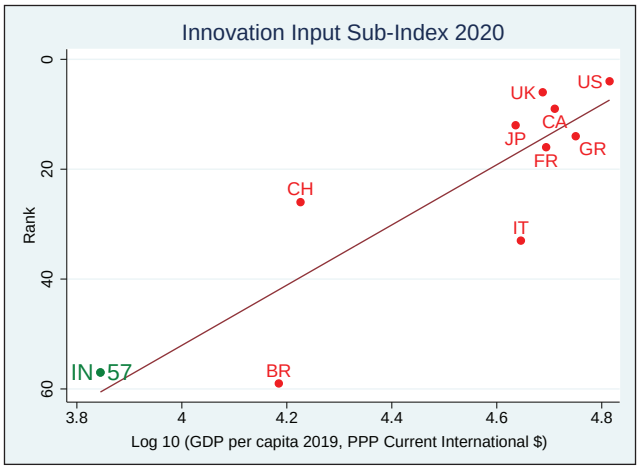
**Figure 15: Performance of Top 10 Economies on Innovation Output Sub-Index**




Source: The World Bank and GII database
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.22 This trend continues in innovation outputs and innovation inputs. Performance on innovation outputs of the ten largest economies (GDP current US$) may be seen in Figure 15. Although India performs as per expectations for its level of development, India is ranked second lowest, after Brazil, on innovation outputs. Figure 16 shows performance on innovation inputs of the ten largest economies (GDP current US$). India performs in line with its level of development but ranks second lowest, after Brazil, on innovation inputs amongst the top ten economies.

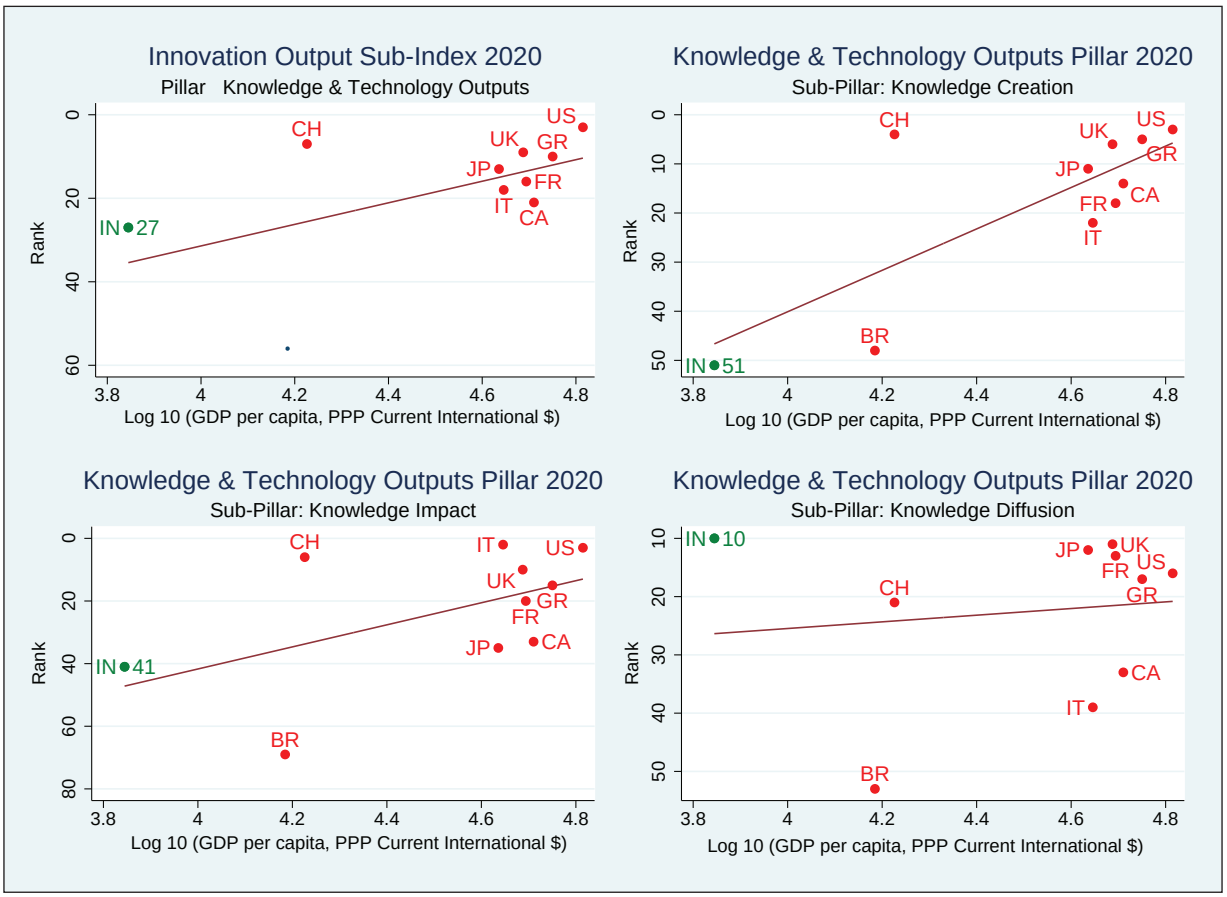
**Figure 16: Performance of Top 10 Economies on Innovation Input Sub-Index**




Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

**Figure 17: Performance of Top 10 Economies on KTO Pillar**

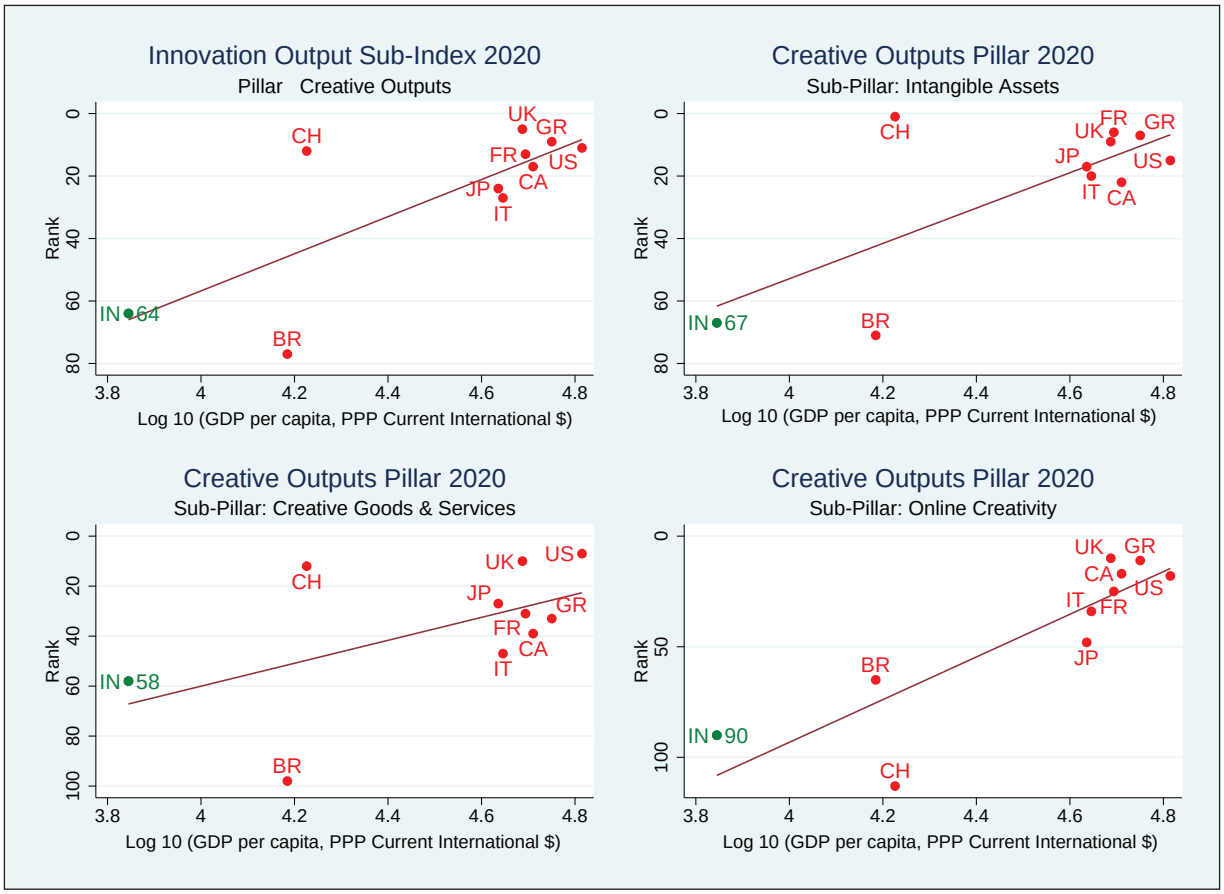



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.23 Figure 17 compares India's performance in its top ranked pillar – KTO w.r.t. the other largest economies. India performs above expectation for its level of development on KTO pillar, performing particularly well on the knowledge diffusion sub-pillar. India ranks highest amongst the top ten economies (GDP current US$) on the knowledge diffusion sub-pillar while it ranks lowest on the knowledge creation sub-pillar. In comparison, China performs much above expectation for its level of development on the KTO pillar as well as knowledge creation and knowledge impact sub-pillars.

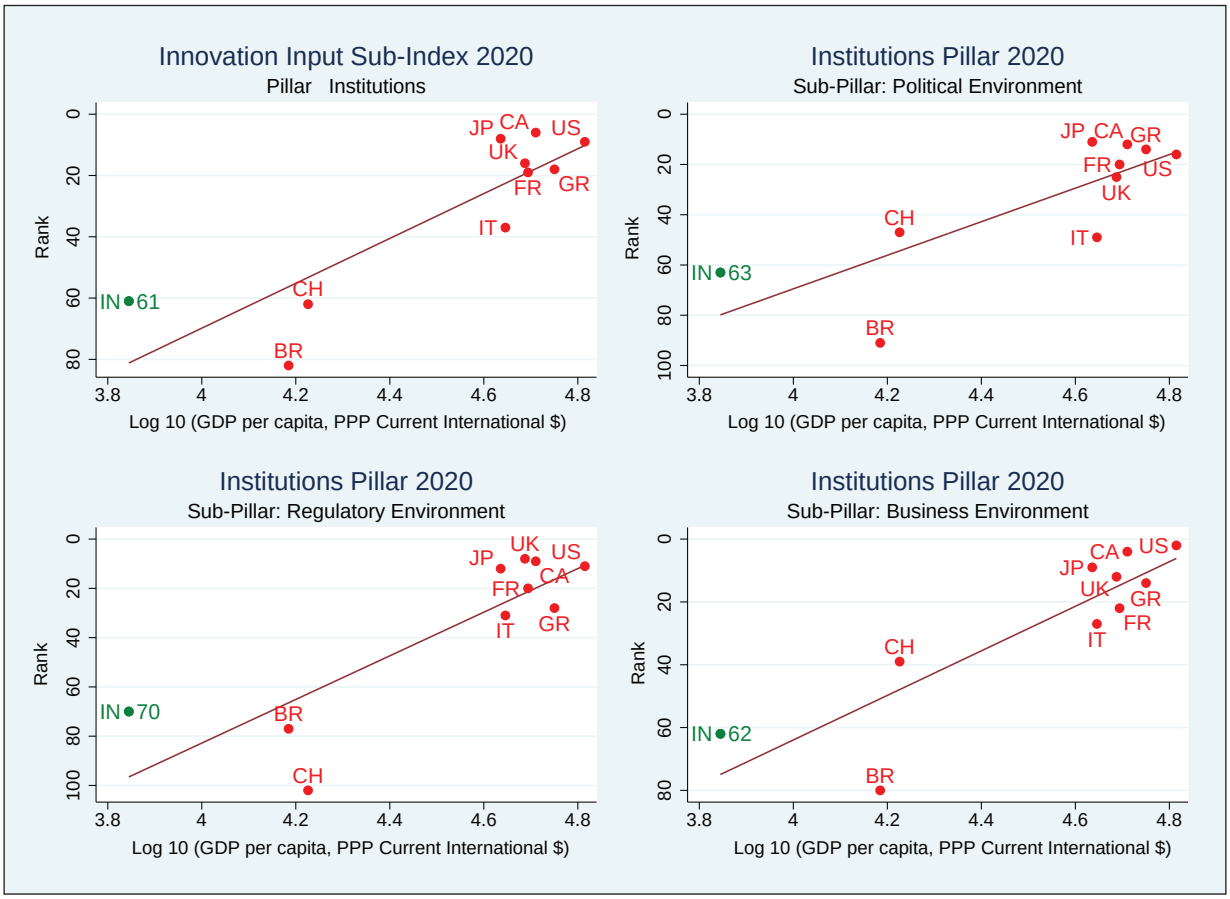
**Figure 18: Performance of Top 10 Economies on Creative Outputs Pillar**




Source: The World Bank and GII database
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.24 Performance of top ten economies on the creative outputs pillar may be seen in Figure 18. India performs in line with its level of development on the creative outputs pillar, performing above expectation on online creativity and creative goods and services. However, India is ranked second lowest, after Brazil, on the creative output pillar and the intangible assets and creative goods and services sub-pillars. India ranks second lowest, after China, on the online creativity sub-pillar. While India performs close to expectation for its level of development on all three sub-pillars, China performs much higher than expected for its level of development on the creative outputs pillar and the intangible assets and creative goods and services sub-pillars.

**Figure 19: Performance of Top 10 Economies on Institutions Pillar**



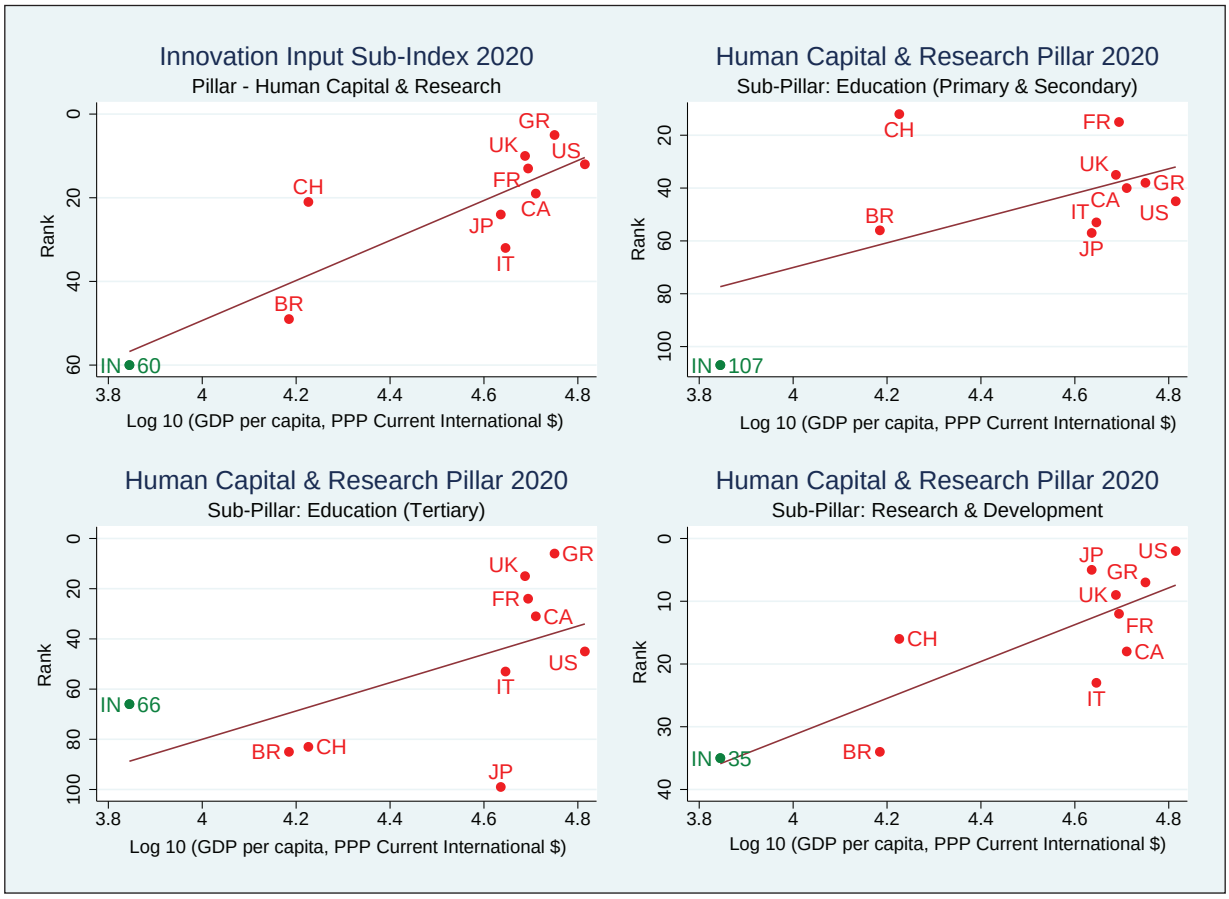

Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.25 Figure 19 compares India's performance on institutions pillar w.r.t. the other largest economies. India performs above expectation for its level of development on the institutions pillar and each of its sub-pillars. However, India ranks third lowest, after Brazil and China, on the institutions pillar and regulatory environment sub-pillar. India ranks second lowest, after Brazil, on political and business environment sub-pillars.

8.26 Figure 20 compares India's performance on HCR pillar w.r.t. the other largest economies. India performs in line with its level of development on the HCR pillar and research & development sub-pillar, while it performs above expectation on tertiary education sub-pillar. However, amongst the top ten economies, India ranks lowest on the HCR pillar and the R&D and primary and secondary education sub-pillars. India ranks fourth lowest – after Japan, Brazil and China, on the tertiary education sub-pillar.

**Figure 20: Performance of Top 10 Economies on HCR Pillar**

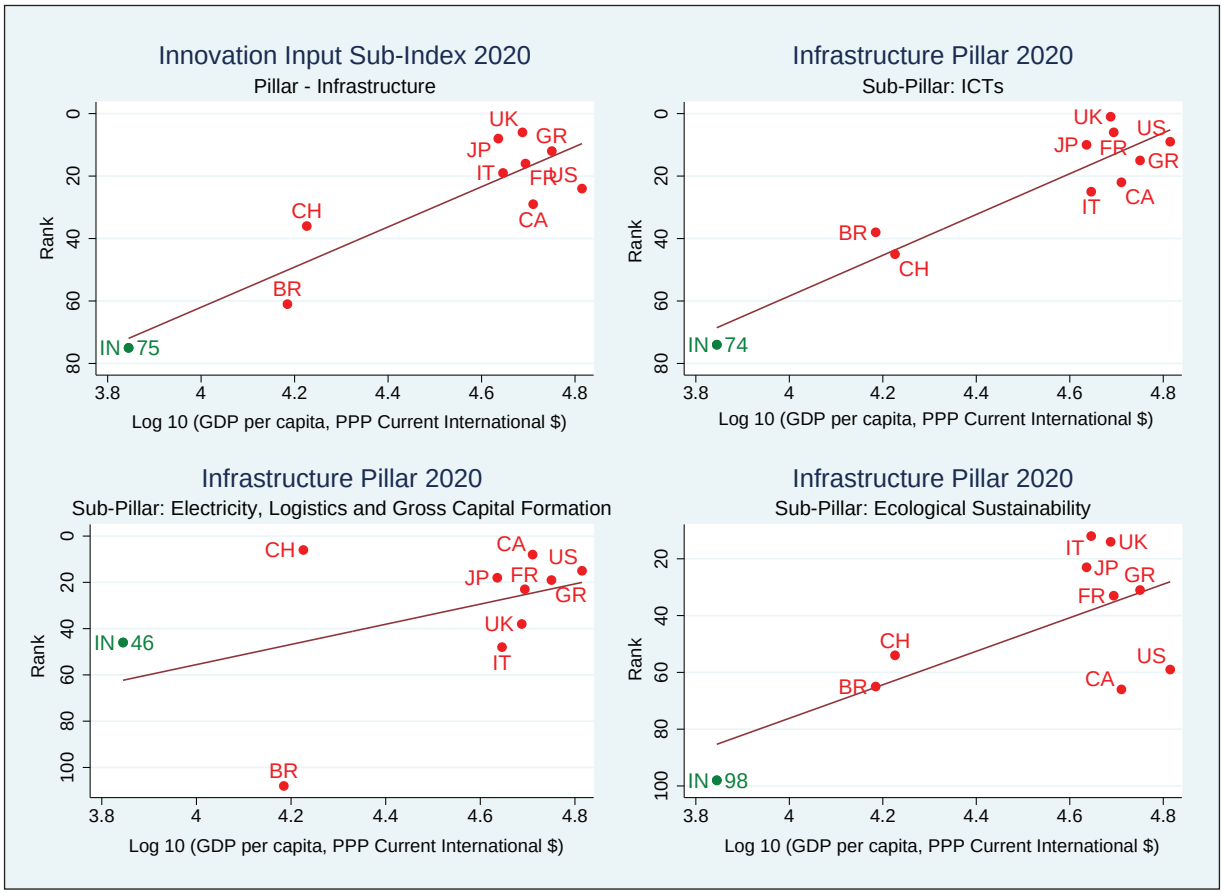



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.27 Figure 21 compares India's performance on infrastructure pillar w.r.t. the other largest economies. India performs in line with its level of development on the infrastructure pillar and ICT sub-pillar and higher than expected on the electricity, logistics and GCF pillar. However, India ranks lowest on the infrastructure pillar and the ICT and ecological sustainability sub-pillars amongst the top ten economies. India ranks third lowest – after Brazil and Italy, on the electricity, logistics and GCF sub-pillar.

**Figure 21: Performance of Top 10 Economies on Infrastructure Pillar**

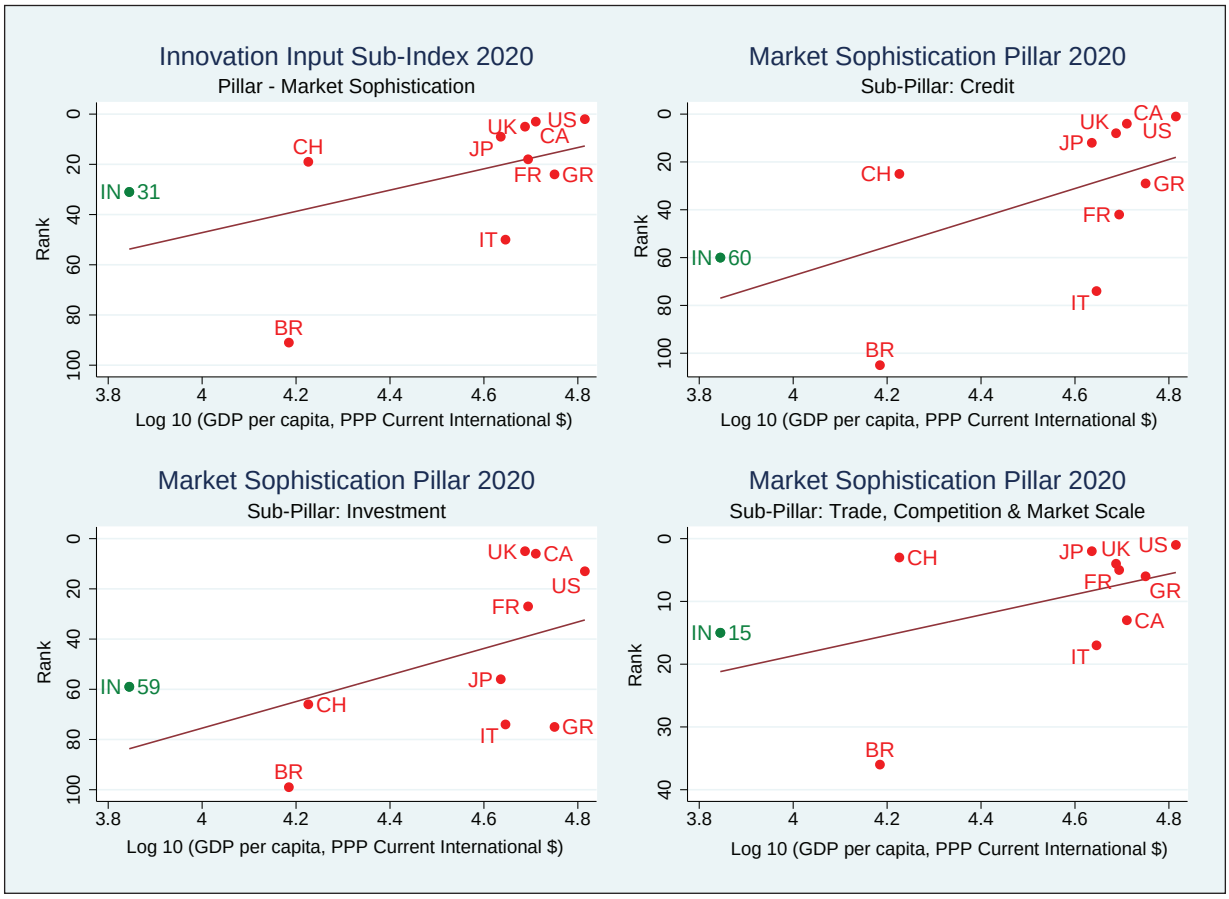



Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.28 Figure 22 compares India's performance on its second best performing pillar – market sophistication, w.r.t. the other largest economies. India performs above expectation for its level of development on the market sophistication pillar and each of its sub-pillars. However, India ranks second lowest, after Brazil and Italy, on the market sophistication pillar and the credit and trade, competition and market scale sub-pillars. India ranks sixth highest on the investment sub-pillar amongst the top ten economies.

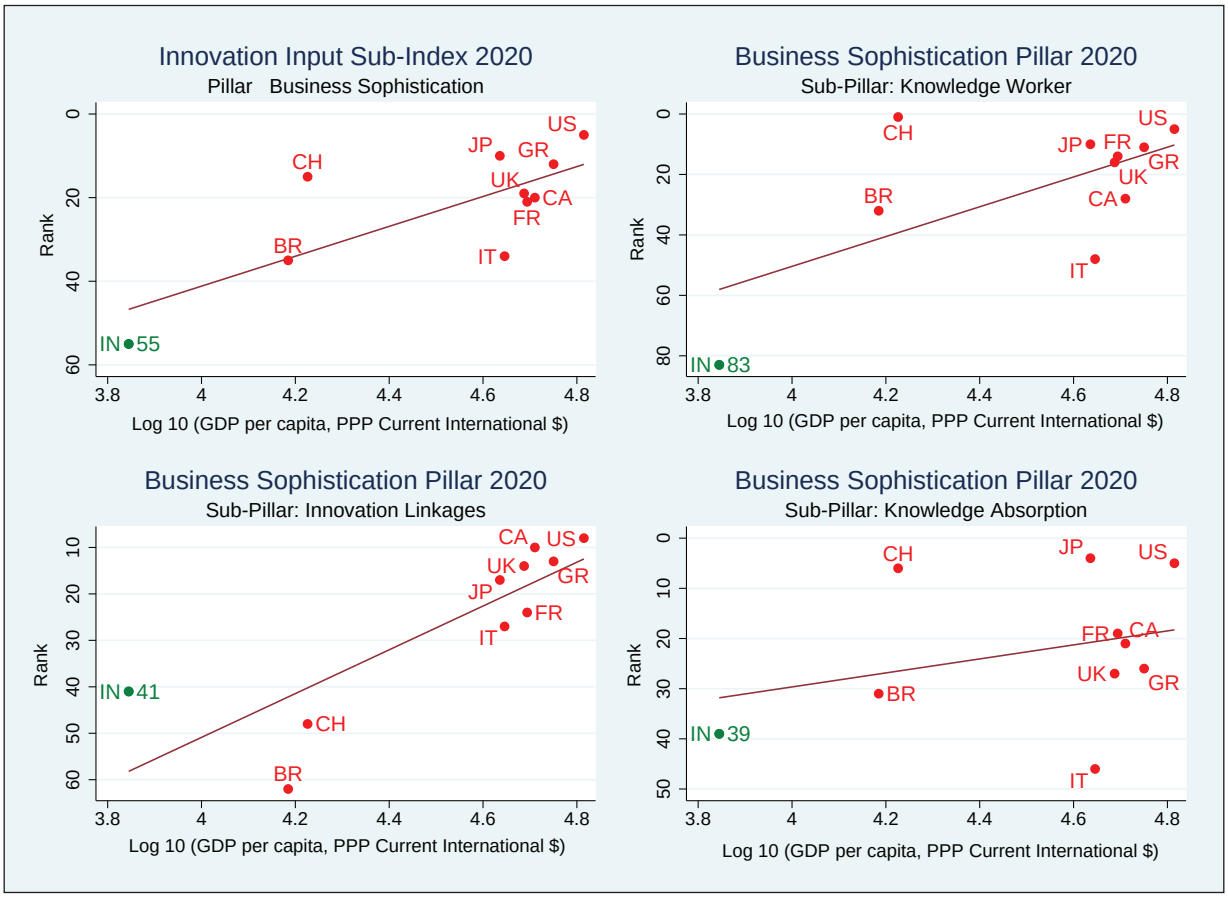
**Figure 22: Performance of Top 10 Economies on Market Sophistication Pillar**




Source: The World Bank and GII database
Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

8.29 Figure 23 compares India's performance on the business sophistication pillar w.r.t. the other largest economies. India performs above expectation for its level of development on the innovation linkages sub-pillar while it performs below expectation for the business sophistication pillar and its other two sub-pillars. Amongst the top ten economies, India ranks lowest on the business sophistication pillar and knowledge worker sub-pillar. It ranks second lowest, after Italy, on knowledge absorption sub-pillar. India ranks third lowest – after Brazil and China, on the innovation linkages sub-pillar.

**Figure 23: Performance of Top 10 Economies on Business Sophistication Pillar**




Source: The World Bank and GII database

Note: Highest possible rank is 1. Figure shows India's innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN=INDIA, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada.

## TRENDS IN INDIA'S INOVATION PERFORMANCE

8.30 India has consistently improved on GII from rank 81 in 2015 to rank 48 in 2020 (Figure 24). While India has performed impressively, there is scope for much more improvement. To put things into perspective, China has improved its rank from 29 to 14 during the same period. China embarked on an ambitious R&D roadmap to become an innovation-oriented economy (see Box 3). We therefore compare India's improvements vis-à-vis that of China on the various dimensions of innovation performance.

## Box 3: R&D Roadmap of China

In January 2006, China initiated a 15-year "Medium to Long Term Plan (MLP) for the Development of Science and Technology". MLP called for China to become an "innovation-oriented society" by the year 2020, and a world leader in science and technology (S&T) by 2050. It committed China to developing capabilities for "indigenous innovation" and to leapfrog into leading positions in new science-based industries by the end of the plan period. The MLP of China used R&D as an important instrument for development of S&T ecosystem.

**MLP – A Snapshot**

**Duration**

- 15 years: 2006 to 2020

**Goals**

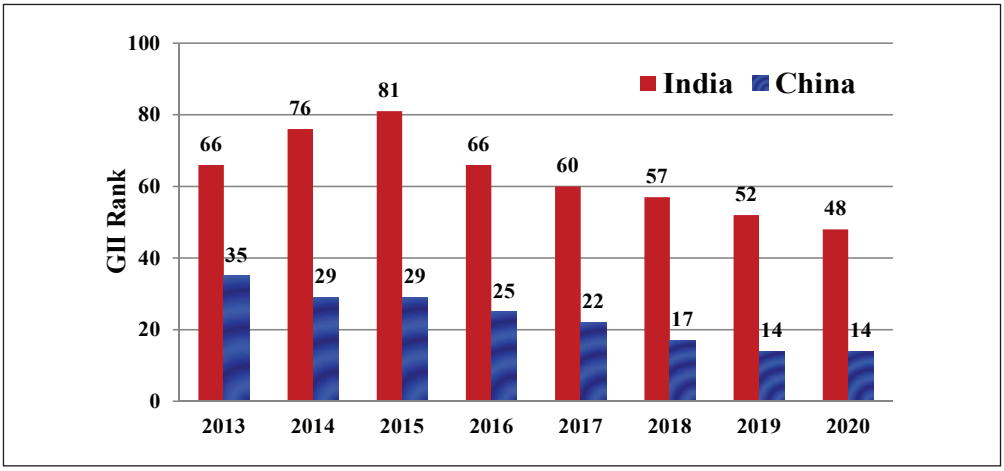
- China to become an "innovation-oriented society"
- A world leader in S&T by 2050
- Developing capabilities for "indigenous innovation" and to leapfrog into leading positions in new science-based industries

**Targets and Instruments**

- Gross domestic expenditure on R&D (GERD) as a percentage of GDP to increase from 1.35 per cent in 2005 to 2.5 per cent by 2020
- Raise contributions to economic growth from technological advance to more than 60 per cent
- Limit dependence on imported technology to no more than 30 per cent
- China to become one of the top five countries in the world in the number of invention patents granted to Chinese citizens
- Chinese-authored scientific papers to become among the world's most cited

Source: Office of Principal Scientific Adviser to the Government of India

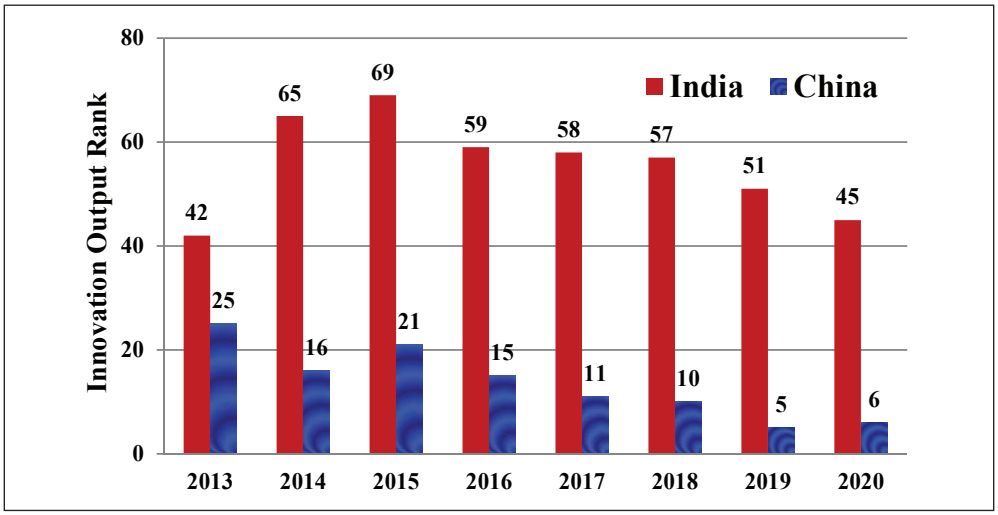
**Figure 24: GII Performance (2013-20)**




Source: GII database

8.31 India's GII rankings have been led by its performance in innovation outputs. Figure 25 shows that India has consistently improved on innovation outputs from rank 69 in 2015 to rank 45 in 2020. Meanwhile, China has improved its rank from 21 in 2015 to six in 2020.

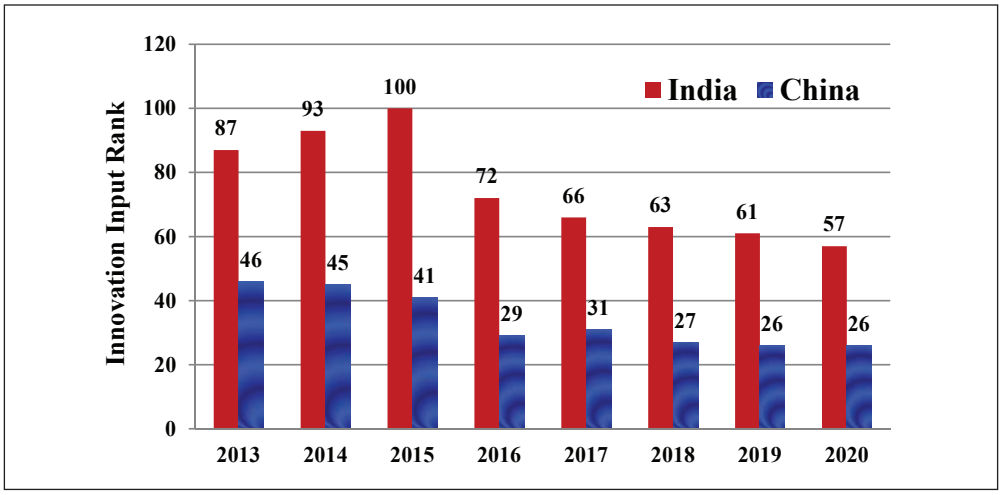
**Figure 25: Innovation Outputs Performance (2013-20)**




Source: GII database

8.32 Figure 26 shows that India has consistently improved on innovation inputs, from rank 100 in 2015 to rank 57 in 2020. China has improved from rank 41 in 2015 to rank 26 in 2020. The year 2016 marked a sharp improvement in India's performance in the innovation input sub-index on account of improvement in HCR, market sophistication and business sophistication performance.

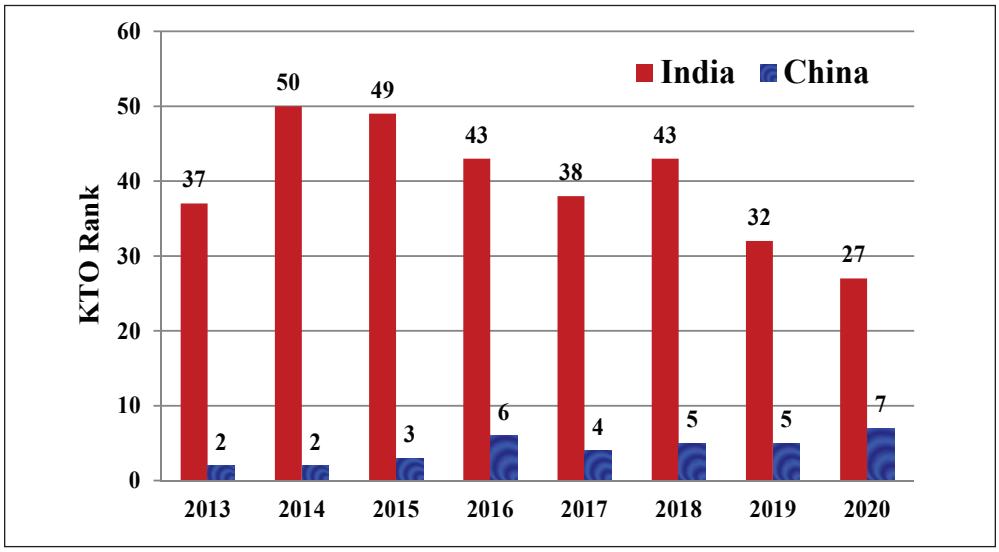
**Figure 26: Innovation Inputs Performance (2013-20)**




Source: GII database

8.33 Amongst output pillars, India has significantly improved on KTO pillar since 2014, almost halving its rank from 50 in 2014 to 27 in 2020 (Figure 27). China's performance slightly worsened, with its rank declining from 2 in 2014 to 7 in 2020 on KTO. India has consistently performed better in the knowledge diffusion sub-pillar as compared to knowledge creation and impact.

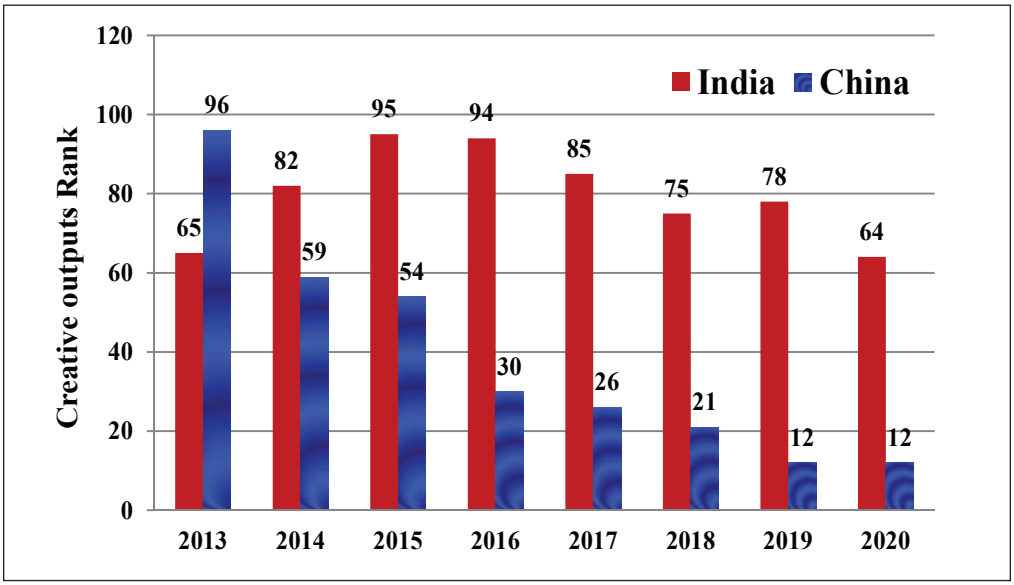
**Figure 27: Knowledge & Technology Outputs Performance (2013-20)**




Source: GII database

8.34 On creative outputs pillar, India's rank improved from 95 in 2015 to 64 in 2020 (Figure 28). Meanwhile, China's rank improved from 54 in 2015 to 12 in 2020. India has been performing better in creative goods & services sub-pillar than intangible assets and online creativity sub-pillars.

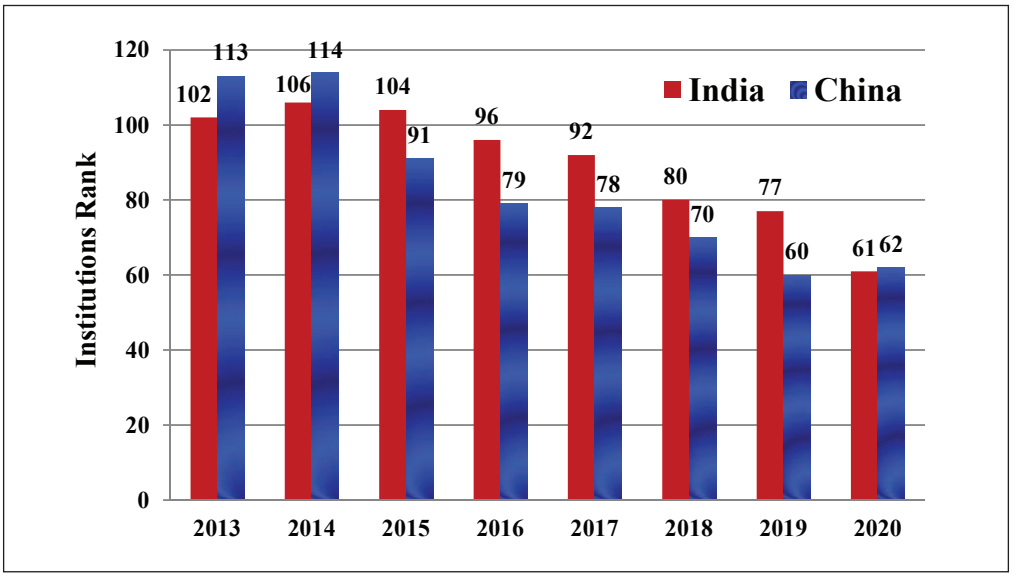
**Figure 28: Creative Outputs Performance (2013-20)**




Source: GII database

8.35 India has improved over time on input pillars as well. Figure 29 shows consistent improvement in India's rank on institutions pillar from 106 in 2014 to 61 in 2020. China's performance is close to India on this front, with rank 114 in 2014 and rank 62 in 2020. India's performance is led by marked improvement in the political and business environment. Business environment further registered a sharp improvement in 2020 as compared to 2019 on account of improvements in the parameter "ease of resolving insolvency".

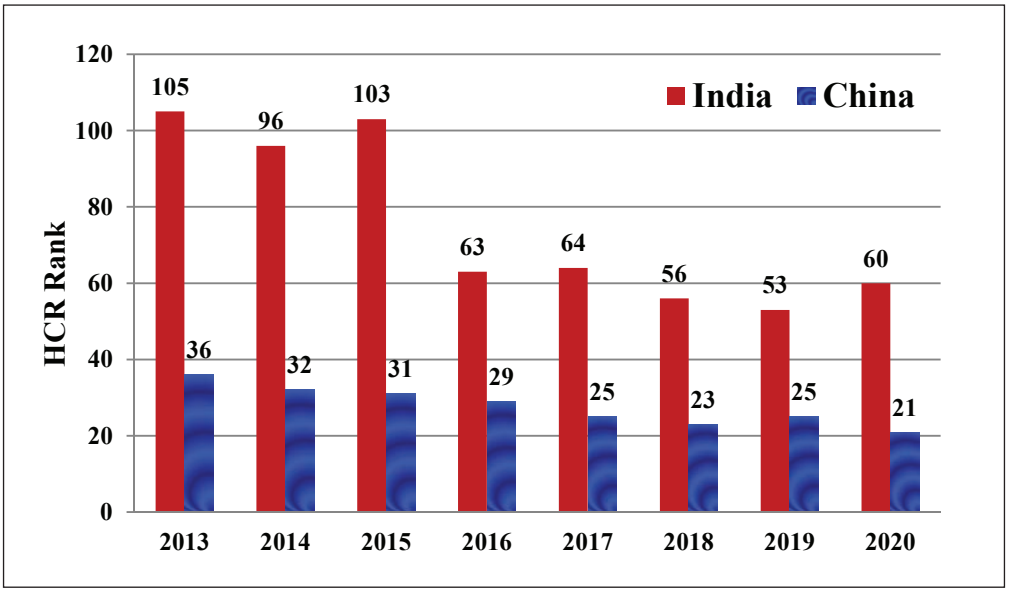
**Figure 29: Institutions Performance (2013-20)**




Source: GII database

8.36 India has significantly improved in the HCR pillar over time from rank 103 in 2015 to 60 in 2020 (Figure 30). China improved from rank 31 in 2015 to rank 21 in 2020. India's improvement in HCR pillar can be attributed to improvements in tertiary education sub-pillar. India has been performing poorly in the primary and secondary education pillar – making it an area requiring focussed attention.

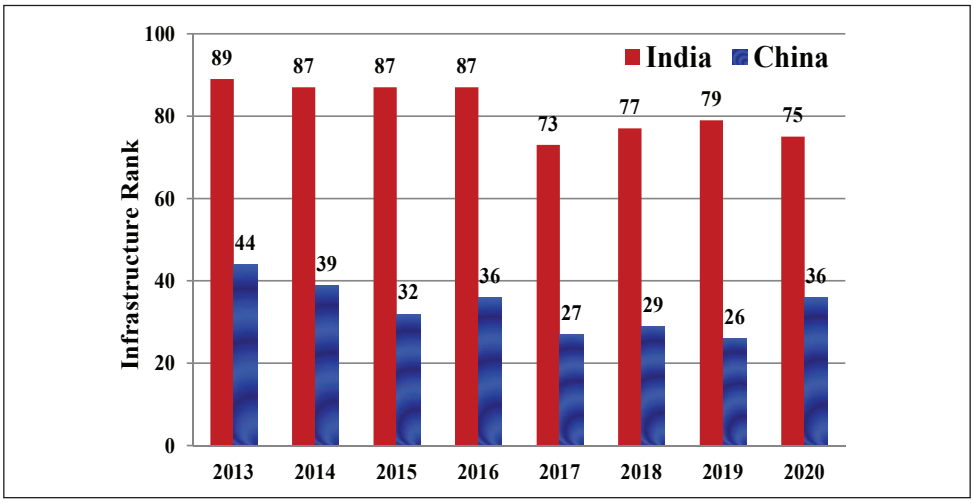
**Figure 30: Human Capital and Research Performance (2013-20)**




Source: GII database

8.37 On the infrastructure pillar, India's rank improved from 89 in 2013 to 75 in 2020 while China's rank improved from 44 to 36 during this period (Figure 31). India has been performing poorly on the ecological sustainability sub-pillar, leading to slow improvement on the infrastructure pillar.

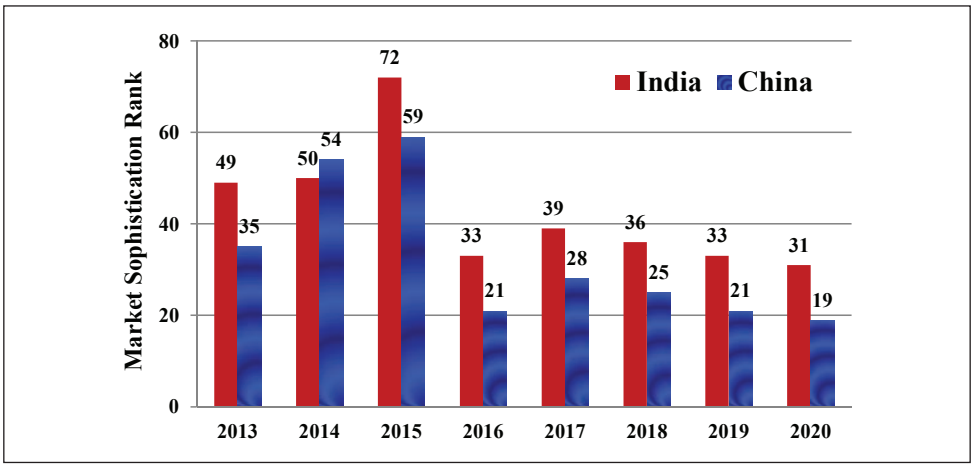
**Figure 31: Infrastructure Performance (2013-20)**




Source: GII database

8.38 India's rank has improved considerably on market sophistication pillar from 72 in 2015 to 31 in 2020 (Figure 32). China's rank has improved from 59 in 2015 to 19 in 2020.The introduction of domestic market scale as a parameter in market sophistication in 2016, led to India's rank improving from 72 in 2015 to 33 in 2016. Since then, India has consistently performed well in the trade, competition and market scale sub-pillar.

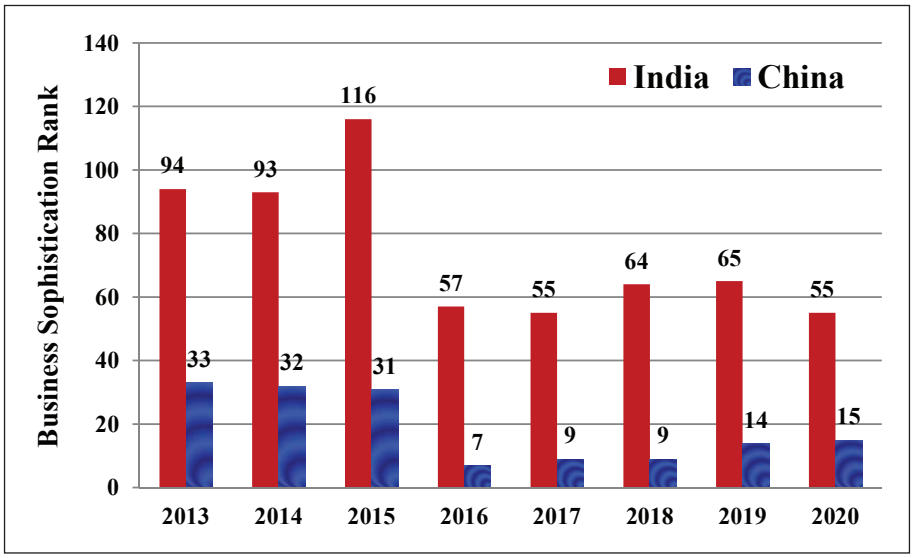
**Figure 32: Market Sophistication Performance (2013-20)**




Source: GII database

8.39 India's rank improved significantly on the business sophistication pillar from 116 in 2015 to 55 in 2020 (Figure 33). China's rank improved from 31 in 2015 to 7 in 2016, thereafter declining to 15 in 2020. India's business sophistication rank improved sharply from 116 in 2015 to 57 in 2016 on account of changed indicators in knowledge absorption sub-pillar and improvement in knowledge workers sub-pillar. In 2020, innovation linkage was overtaken by knowledge absorption as the best performing business sophistication sub-pillar for India. This improvement is a positive sign and can be expected to feed into further improvements. India has consistently lagged behind on the knowledge workers sub-pillar, making it an area warranting focussed attention.

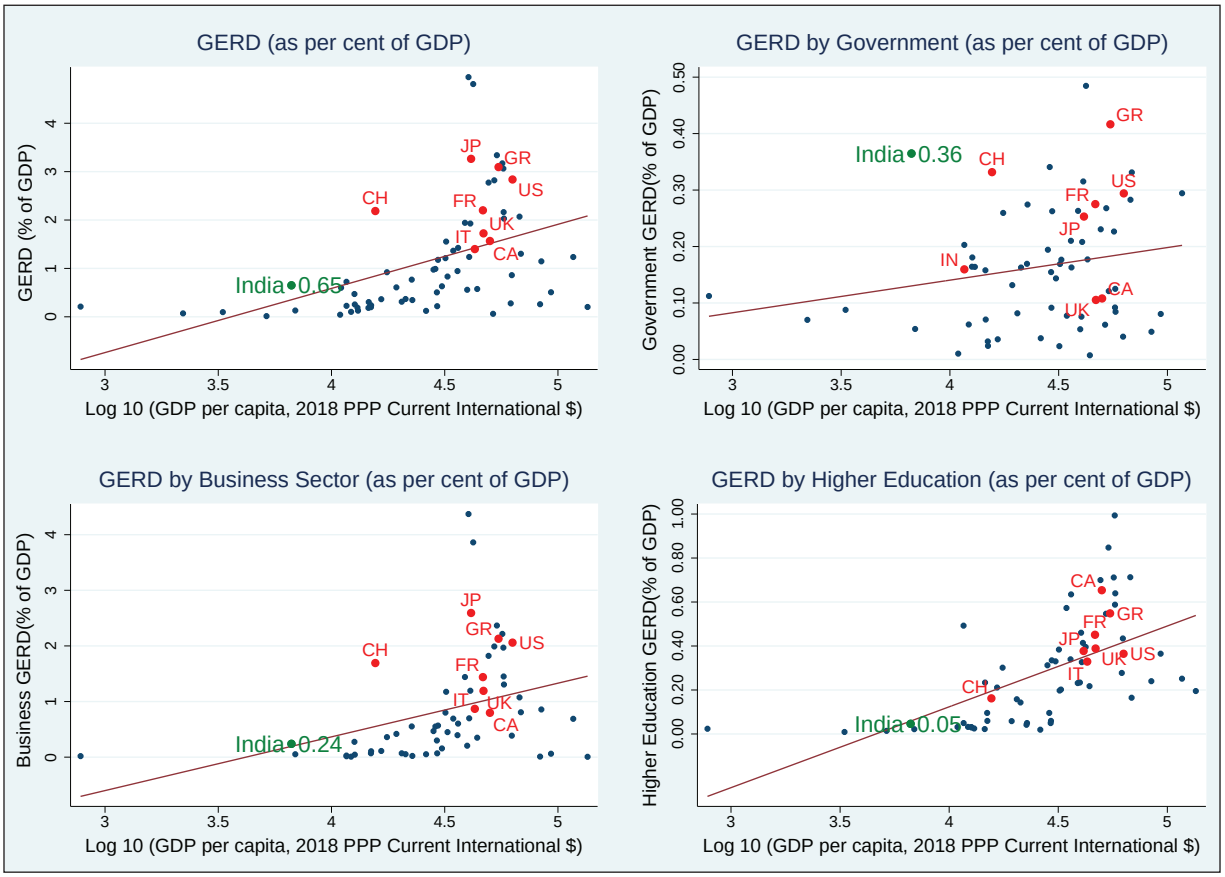
**Figure 33: Business Sophistication Performance (2013-20)**




Source: GII database

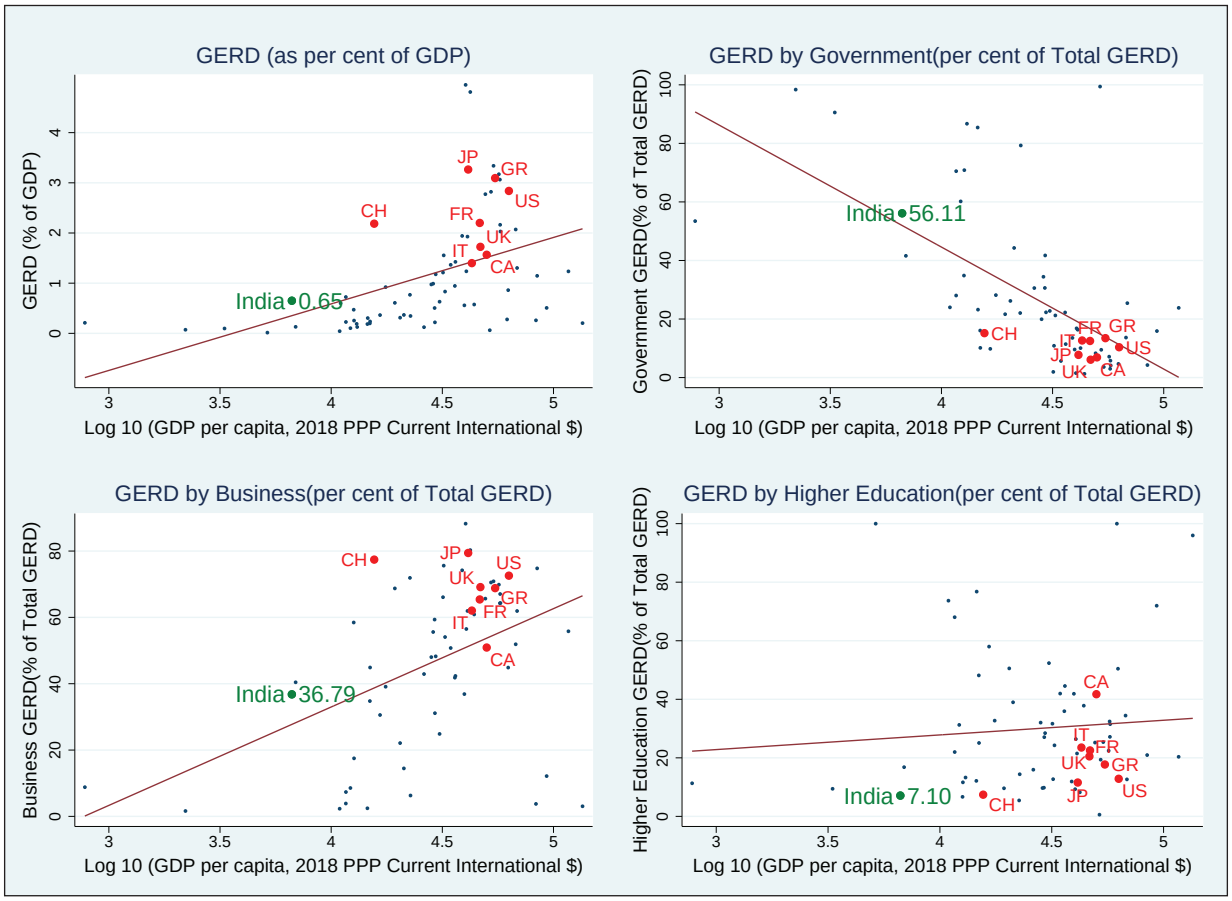
## R&D EXPENDITURE IN INDIA

**Figure 34: Total GERD and Sector-wise Contributions to GDP, 2018**




Note: Figure shows India's GERD values. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy and CA = Canada.
Source: The World Bank and UNESCO

**Figure 35: Sector-wise Contributions to Total GERD, 2018**




Note: Figure shows India's GERD values. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy and CA = Canada.
Source: The World Bank and UNESCO

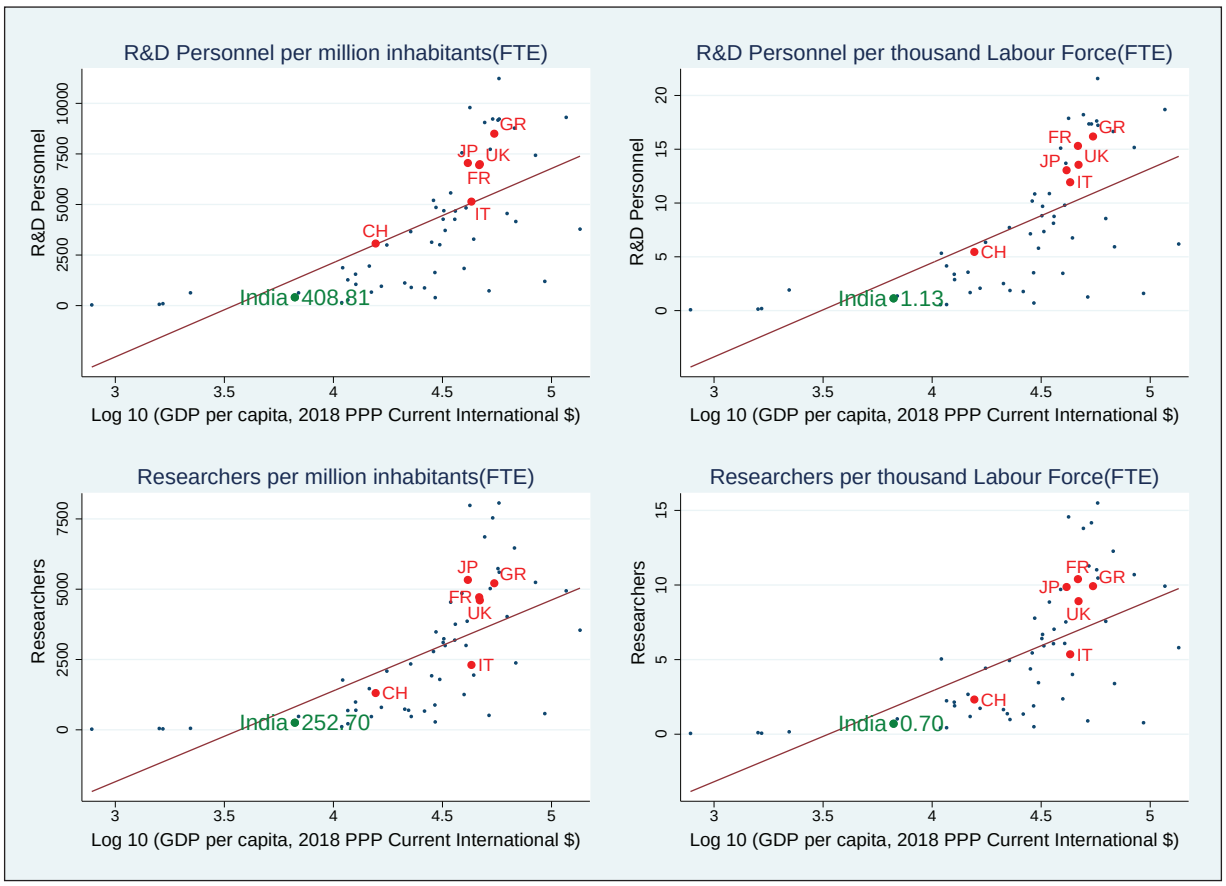
8.40 Research & Development (R&D) investment is a key input in innovation. Figure 34 shows gross domestic expenditure on R&D (GERD) as per cent of GDP in relation to the level of development measured by GDP per capita on PPP basis. Although India's GERD is in line with expectation for its level of development, there is much scope for improvement. Other top ten economies such as USA, China, Japan, Germany and France have higher than expected GERD for their level of development. India's business sector and higher education sector contribution to GERD as per cent of GDP is in line with its level of development. However, the business sector's GERD in USA, China, Japan and Germany is much higher as expected for their level of development. Higher education sector in Canada and Germany also has larger GERD than their level of development.

8.41 Figure 35 shows positive correlation between the level of development and GERD as per cent of GDP and business sectors' participation in total GERD while government sector's participation in GERD is negatively correlated with development. In India, the Government contributes 56 per cent of GERD while this proportion is less than 20 per cent in each of the top ten economies. Yet, India's GERD is much lower than that of the top ten economies because India's business sector contributes a much smaller per cent to total GERD (about 37 per cent)

than the business sector in all the other large economies such as China, US, Japan and UK (68 per cent on average). This can be clearly seen because the proportion contributed to GERD by higher education is similar in India as in the top 10 economies.

8.42 Figure 36 presents the total full time equivalent (FTE) R&D personnel and researchers in relation to the level of development. India performs below expectation for its level of development in terms of R&D personnel and researchers, making it an area warranting attention. Other large economies such as Japan, Germany and France have higher than expected R&D manpower for their level of development. India has amongst the lowest number of R&D manpower as compared to other top ten economies (GDP current US$).

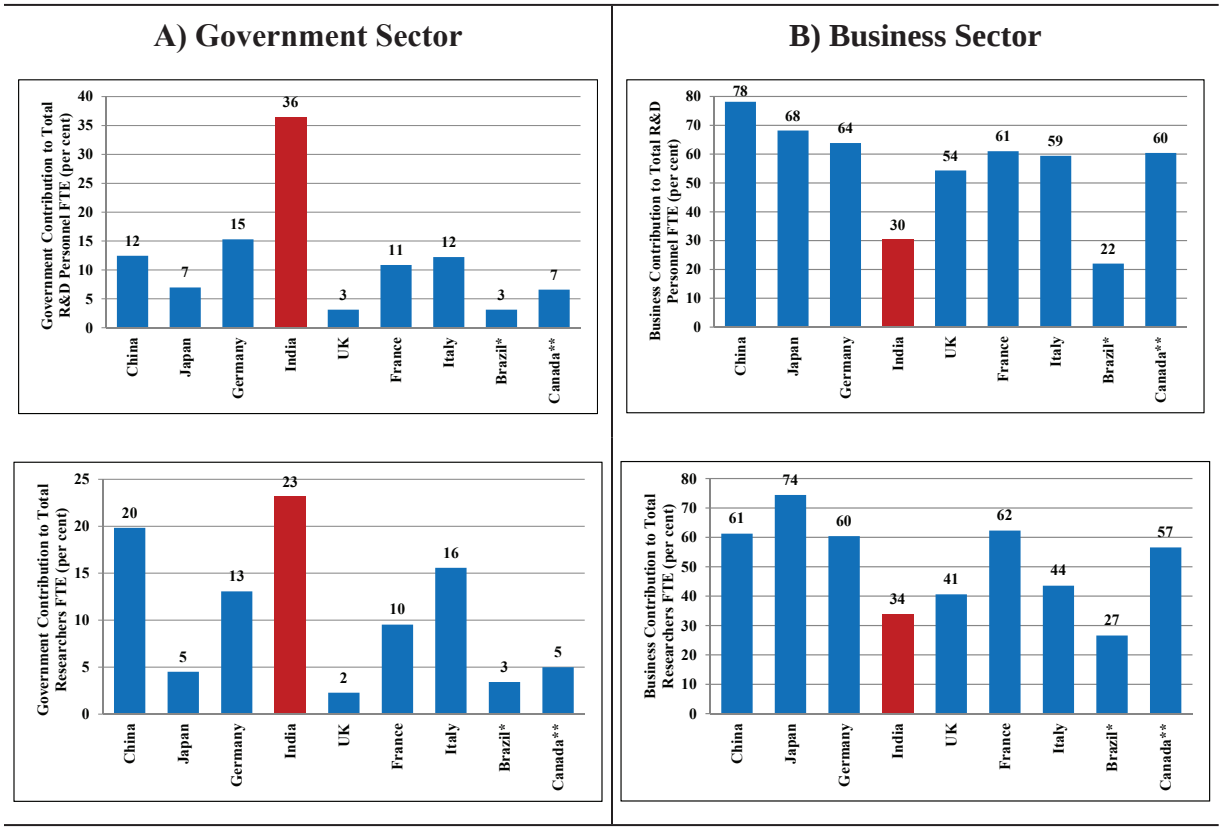
**Figure 36: R&D Personnel and Researchers, 2018**




Note: Figure shows India's Personnel/Researchers. CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy.
Source: The World Bank and UNESCO

8.43 Figure 37 shows that government sector's contribution to total FTE R&D personnel (36 per cent) and researchers (23 per cent) in India was the highest amongst the top ten economies in 2018 (nine per cent on average). However, Indian business sector's contribution to R&D personnel (30 per cent) and researchers (34 per cent) was the second lowest, after Brazil, amongst the top ten economies (over 50 per cent on average).

**Figure 37: R&D Personnel and Researchers by Sector, 2018**




Source: UNESCO
Note: *Brazil data from 2014. **Canada data from 2017. Data for USA not available.

## INDIA'S PERFORMANCE ON PATENTS AND TRADEMARKS

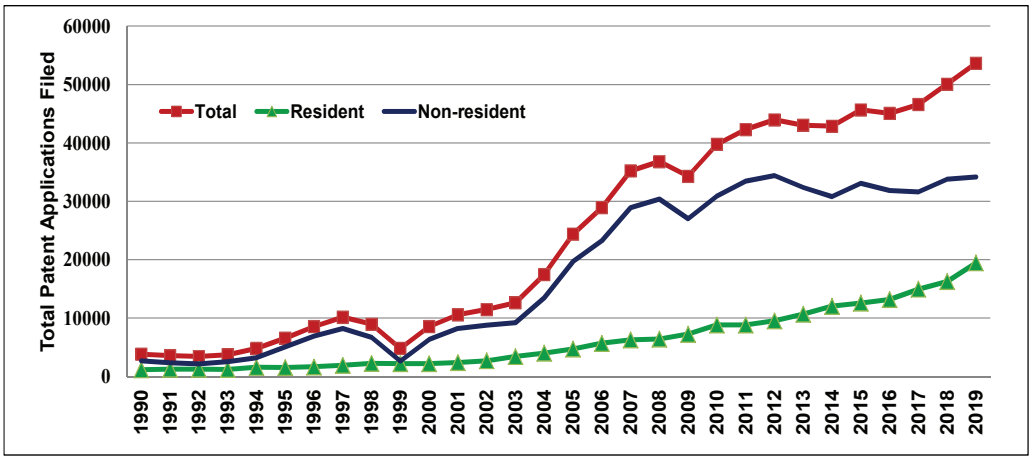
8.44 Figure 38 shows the trend in total patent applications filed in India by resident and non-residents during the period 1990-2019. The total number of patents filed in India has risen steeply since 1999, mainly on account of increase in patent applications filed by non-residents. While patent applications filed by residents have increased steadily since 1999, they have risen at a much lower rate than patent applications by non-residents.

### Box 4: Non-Resident Indians and Innovation

Breschi, Lissoni and Miguelez (2017) estimated that around six per cent of US-resident inventors listed at the European Patent Office in 2009 had an Indian name and surname. This was roughly the same as the Chinese. This more than the French, Germans and Italians combined.

Large-scale out-migration of skilled workforce and students from India is not necessarily bad news for India's innovation aspirations. This could potentially result in return of higher-skilled workforce in future. However, this would require an enabling environment that facilitates re-entry into the Indian job-market and high-tech research opportunities.

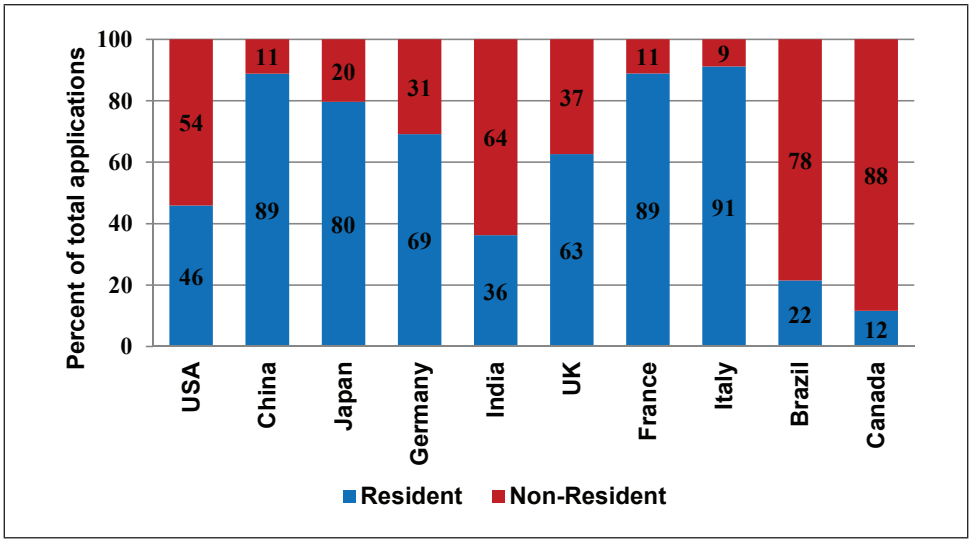
**Figure 38: Trend in Patent Applications Filed in India**




Source: WIPO

8.45 Unlike India, Brazil and Canada, other top ten economies (GDP current US$) have a higher share of patent applications by residents than non-residents (Figure 39). Improving resident share in patents should be a matter of priority to make advancements in innovation.

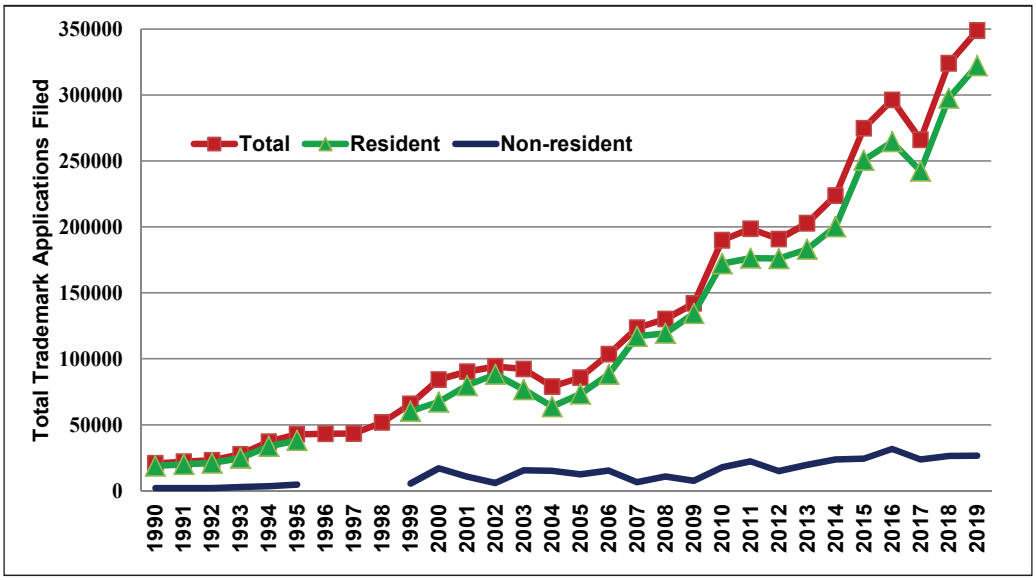
**Figure 39: Patent Applications Filed by Residents and Non-Residents, 2019**




Source: WIPO

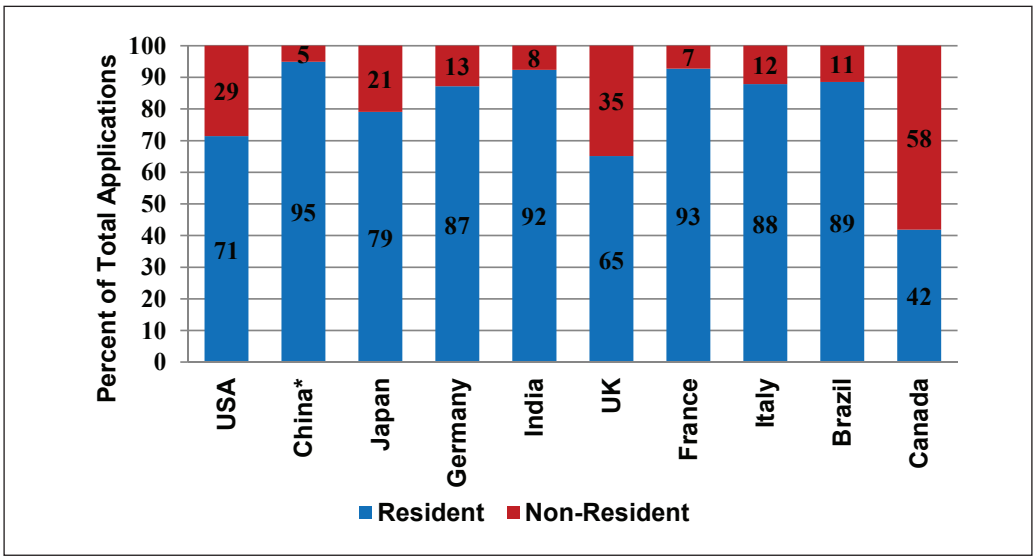
8.46 Figure 40 shows the trend in total trademark applications filed in India by resident and non-residents during the period 1990-2019. Unlike patents, the total number of trademark applications filed in India has risen steeply since 1999 mainly on account of increase in trademark applications filed by residents.

**Figure 40: Trend in Trademark Applications Filed in India**




Source: WIPO

**Figure 41: Trademark Applications Filed by Residents and Non-Residents, 2019**




Note: * China data pertains to 2014.
Source: WIPO

8.47 India's trend of larger resident-share in total trademark applications is similar to that observed across other top ten economies (GDP current US$) except Canada (Figure 41). Larger share of residents in total trademark applications filed in India is a positive sign for advancement in innovation.

## IS INDIAN INNOVATION AFFECTED BY ACCESS TO FINANCE?

### Box 5: Methodology for Estimating Correlation between Financial Development and Innovation

Hsu, Tian and Xu (2014) observed that industries that are more dependent on external finance, and are more high-tech intensive, exhibit disproportionally higher innovation in countries with well developed equity markets. This may be on account of four reasons. Firstly, because there are no collateral requirements for equity financing, additional equity financing doesn't increase firms' probability of financial distress (Brown, Fazzari, and Petersen, 2009). Secondly, under rational expectations, equity markets enable investors to extract relevant, but noisy, information from equilibrium prices (Grossman, 1976; Levine, 2005). Thirdly, as information on the prospects of innovative projects is either sparse or hard to process, evaluating innovative projects is difficult. Equity markets can facilitate this evaluation through information embedded in stock market prices (Allen and Gale, 1999). Finally, equity financing can be particularly well suited for innovative projects that are riskier (Levine, 2005). New technology stocks can also be priced higher when information about their greater productivity, but higher uncertainty, reaches stock investors (Pástor and Veronesi, 2009).

On the other hand, Hsu, Tian and Xu (2014) observed that developed credit markets appear to discourage innovation in industries that are more dependent on external finance and are more high-tech intensive. This may be on account of two factors. Firstly, innovative firms may have limited collateral to deploy for debt financing by way of tangible assets, restricting their use of debt (Brown, Fazzari, and Petersen, 2009). Secondly, risk-averse banks under-invest in high-uncertainty innovative projects (Stiglitz, 1985). Some studies have found that due to banks' informational advantages, they could even inhibit innovation by extracting rents (Hellwig, 1991 and Rajan, 1992).

Based on Hsu, Tian and Xu's findings, access to equity capital is measured using two indicators:

i. Market capitalisation of listed domestic companies (per cent of GDP)
ii. Venture capital availability rank (based on Venture Capital Availability Index)

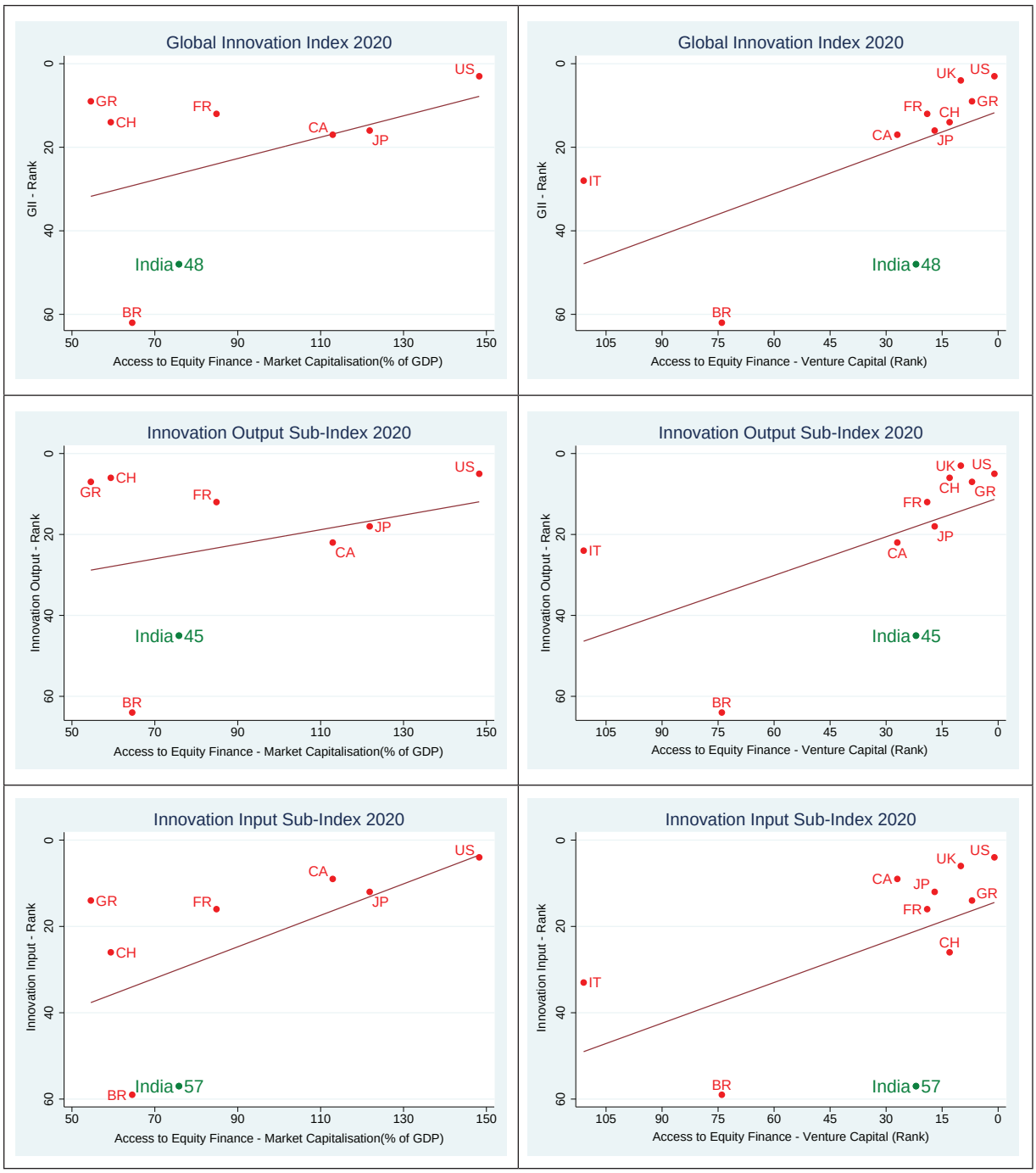
Similarly, access to debt capital is measured using the following indicator:

i. Domestic credit to private sector by banks (per cent of GDP)

8.48 Figure 42 examines the performance of top ten economies (GDP current US$) on innovation with respect to availability of equity finance – market capitalisation of listed domestic companies (as per cent of GDP) as well as venture capital availability rank. India and Brazil rank much below expectation for their level of equity market development in the overall GII, innovation outputs and innovation inputs amongst the top ten largest economies. Given that most of these large economies are more innovative than India and equity market development facilitates greater high-technology innovation, this potentially indicates that innovation in India needs to become more high-tech intensive.

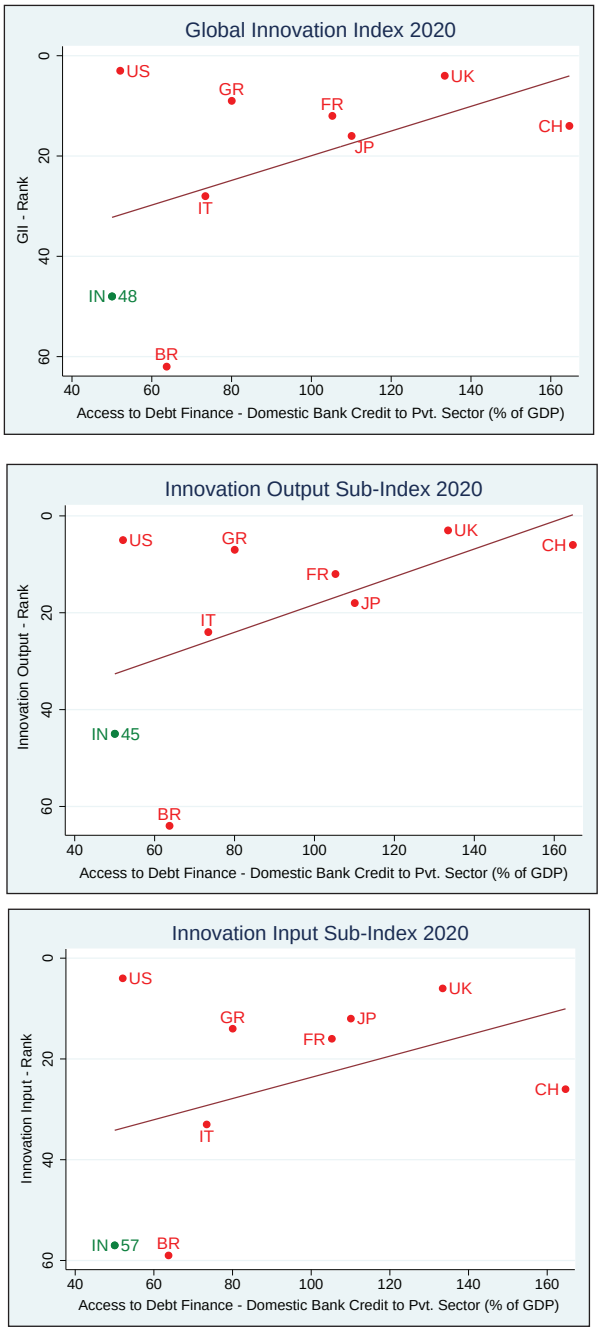
**Figure 42: Innovation and Access to Equity Finance**

**A) Equity Capital (Market Capitalisation)** **B) Equity Capital (Venture Capital)**




Note: Highest possible rank is 1. Figure shows India's Innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, UK = United Kingdom, FR = France, IT = Italy, BR = Brazil and CA = Canada. Venture capital ranks are from 2019. Market capitalisation data for USA, France and Canada are from 2018, rest are from 2019.
Source: The World Bank and GII database

**Figure 43: Innovation and Access to Debt Finance**




Note: Highest possible rank is 1. Figure shows India's Innovation rank. US = USA, CH = China, JP = Japan, GR = Germany, IN = India, UK = United Kingdom, FR = France, IT = Italy and BR = Brazil. Debt finance data pertains to 2019

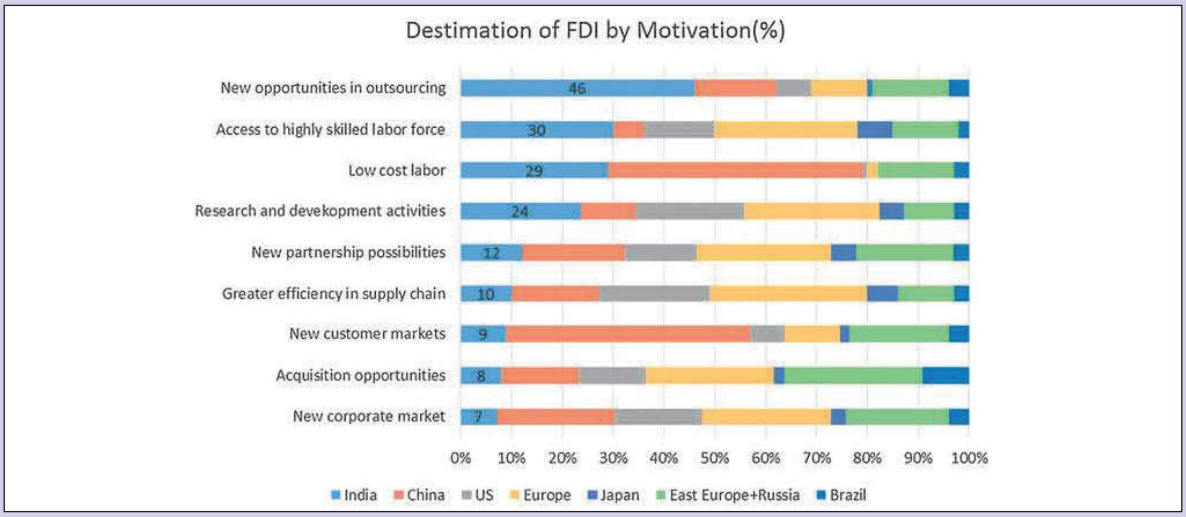
Source: The World Bank and GII database

8.49 Figure 43 shows the performance of top ten economies (GDP current US$) on innovation with respect to availability of debt finance in the form of domestic credit to the private sector by banks (per cent of GDP). India and Brazil rank much below expectation for their level of debt market development in the overall GII, innovation outputs and innovation inputs amongst the top ten largest economies.

## Box 6: R&D Activities in India

Motohashi (2015) suggests that India is a highly attractive R&D destination on account of the opportunities offered for outsourcing, highly skilled labour force, low cost labour and R&D activities. This has led to large scale off-shoring from US firms, especially in the IT industry and that *"companies such as IBM, Intel, and GE conduct cutting-edge R&D in India. The economic growth and increasing income levels in India have made the Indian market attractive, and local R&D activities have been on the rise, particularly in the automotive market. Thus, India has world-class potential both as a global R&D center targeting global markets and as a regional R&D hub for its local market and markets in emerging countries"*

**Attractiveness of FDI Destination by Host-Country and Motivation (per cent), 2004**




Source: Motohashi (2015)

**Highlights of R&D incentives in select countries (2012-17)**

| Countries | Tax Allowance/ Deductions | Tax Credit | Accelerated Depreciation on the R & D assets/Capital | Reduced Tax Rates | Tax Holiday | Tax Deferrals | Tax Exemptions (Excise & Custom duty) | Grants |
|---|---|---|---|---|---|---|---|---|
| Brazil | √ | | √ | √ | | | | √ |
| China | √ | | √ | √ | | | √ | |
| India | √ | | √ | | √ | | √ | √ |
| South Africa | √ | | √ | | | | | |
| Germany | | | | | | | | √ |
| Japan | | √ | | | | | | |
| Malaysia | √ | | | | | | | √ |
| Republic of Korea | | √ | | | | | | |
| Thailand | √ | | | √ | | | | √ |
| USA | | √ | | | | √ | | |

Source: Saha and Shaw (2018)

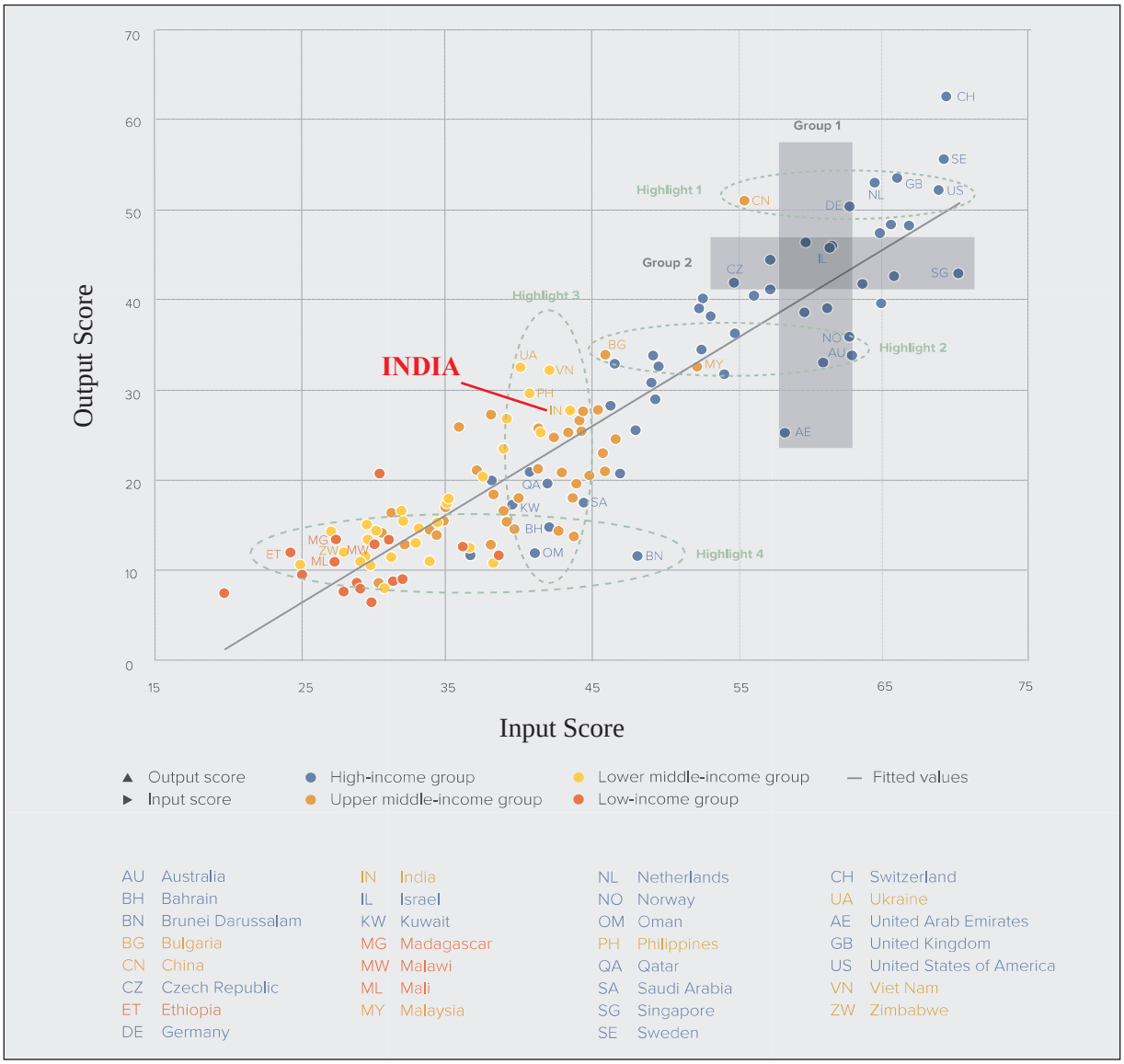
**R&D Tax Incentives in India:** India has had a generous R&D tax incentive framework. Finance Act 2016, w.e.f. April 2018, allowed a weighted deduction of 150 per cent of expenditure w.r.t. scientific research on in-house R&D facility as compared to 200 per cent earlier. Finance Act 2016 further allowed for reduction of this deduction to 100 per cent from assessment year beginning on or after April 1, 2021. The Taxation Laws (Amendment) Act 2019 amended the Income Tax Act 1961 and Finance (No. 2) Act 2019, allowing domestic companies the option to pay income tax @22 per cent subject to the condition that they will not avail any exemption/incentive. The effective rate for these companies was made 25.17 per cent inclusive of surcharge and cess. These companies were also not required to pay Minimum Alternate Tax.

To put this in perspective, the USA provided R&D tax relief in 2019 through an incremental R&D tax credit with four components: two main modalities – regular research credit (20 per cent headline rate) and alternative simplified credit (6-14 per cent headline rate) - which were mutually exclusive in their use and two additional specific schemes (20 per cent headline rate), which only applied to certain expenses for basic research and energy research (OECD). China in 2019 provided R&D tax relief through volume-based R&D tax allowance, with headline rates being 75 per cent for SMEs and large enterprises, which increased from 50 per cent earlier (OECD). In 2019, Japan offered volume-based and incremental tax credits that could be claimed in combination, with headline rates under different schemes ranging between 6-30 per cent and overall R&D tax benefits capped at 45 per cent of the corporate income tax liability before the credit was applied (OECD). Germany offered no expenditure based R&D tax support (OECD, 2018)

## IS INDIA EFFECTIVELY TRANSLATING INNOVATION INPUTS INTO INNOVATION OUTPUTS?

8.50 Figure 44 examines the relationship between innovation inputs and innovation outputs. Economies below the line are unable to effectively translate their costly investments in innovation inputs to better quality and more innovation outputs. It may be seen that India is able to effectively translate investments in innovation inputs to produce a higher level of innovation outputs. This implies that India stands to gain more from its investments into innovation than many other countries. With higher investments, it may be possible that this relationship between innovation inputs and innovation outputs becomes even more favourable for India, and there is greater "bang for the buck" as regards India's investments in innovation.

**Figure 44: Innovation Input to Innovation Output Performance, 2020**




Source: GII 2020 Report

## Which innovation inputs can best explain innovation outputs?

### Box 7: Methodology of Estimating Elasticity of Innovation Output Ranks to Innovation Input Ranks

We used a balanced panel of 117 countries, omitting 14[1] countries with missing data, for the years 2013-20. We first performed a Fixed Effects (FE) regression with Country and Time fixed effects. The Null Hypothesis that coefficients for all years are jointly equal to zero, couldn't be rejected. Hence, time fixed effects were not needed. Thereafter, a Hausman test for Fixed Effects vs Random Effects was run, leading to rejection of Random Effects model.

[1]Benin, Brunei Darusallam, Cabo Verde, Ethiopia, Ghana, Iran, Lao, Mauritius, Morocco, Myanmar, Trinidad & Tobago, Uzbekistan, Yemen and Zimbabwe

Table 1 below report results for the following form of FE regression:

***Log Innovation Output rank = $\beta_1$ Log Institutions rank + $\beta_2$ Log HCR rank + $\beta_3$ Log Infrastructure rank + $\beta_4$ Log Market Sophistication rank + $\beta_5$ Log Business Sophistication rank + Controls for GDP/ GDP per capita/ population (depending on Model 1-5)***

Table 2 below report results for the following form of FE regression:

***Log Knowledge & Technology Output rank = $\beta_1$ Log Institutions rank + $\beta_2$ Log HCR rank + $\beta_3$ Log Infrastructure rank + $\beta_4$ Log Market Sophistication rank + $\beta_5$ Log Business Sophistication rank + Controls for GDP/ GDP per capita/ population (depending on Model 1-5)***

Table 3 below report results for the following form of FE regression:

***Log Creative Output rank = $\beta_1$ Log Institutions rank + $\beta_2$ Log HCR rank + $\beta_3$ Log Infrastructure rank + $\beta_4$ Log Market Sophistication rank + $\beta_5$ Log Business Sophistication rank + Controls for GDP/ GDP per capita/ population (depending on Model 1-5)***

8.51 Table 1 reports panel Fixed Effects (FE) regression results for dependant variable Log Innovation Output rank for five models with different independent variables - Log input pillars, Log GDP, Log GDP per capita and Log population. Among the input pillars, it shows that Log Institutions rank and Log Business Sophistication rank is highly significant and positively correlated with Log Innovation Output rank, controlling for other pillars, income and population. Log population, when included, was found significant and positively correlated with Log Innovation Output rank, controlling for other pillars and income. This suggests that improvements in institutions and business sophistication could lead to higher innovation output performance.

**Table 1: Panel Regression Results: Fixed Effects**

| Dependant Variable: Log Innovation Output rank | | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| **VARIABLES** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** |
| Log Institutions rank | 0.175*** | 0.173*** | 0.162*** | 0.168*** | 0.162*** |
| | (0.0536) | (0.0549) | (0.0537) | (0.0546) | (0.0537) |
| Log HCR rank | -0.0099 | -0.0103 | -0.0043 | -0.0101 | -0.0043 |
| | (0.0376) | (0.0378) | (0.0375) | (0.0377) | (0.0375) |
| Log Infrastructure rank | -0.0179 | -0.0192 | -0.0226 | -0.0219 | -0.0227 |
| | (0.0334) | (0.0329) | (0.0323) | (0.0326) | (0.0323) |
| Log Market Sophistication | 0.0106 | 0.0107 | 0.0149 | 0.0116 | 0.0149 |
| rank | (0.0325) | (0.0325) | (0.0324) | (0.0324) | (0.0324) |
| Log Business Sophistication | 0.0998*** | 0.0993*** | 0.0934*** | 0.0975*** | 0.0933*** |
| rank | (0.0339) | (0.0343) | (0.0342) | (0.0344) | (0.0342) |
| Log GDP (PPP)^ | | -0.0187 | -0.112 | | |
| | | (0.0604) | (0.0728) | | |

| | | | | | |
|---|---|---|---|---|---|
| Log Population^ | | | 0.495** | | 0.384** |
| | | | (0.214) | | (0.183) |
| Log GDP per capita (PPP)^ | | | | -0.0641 | -0.114 |
| | | | | (0.0704) | (0.0727) |
| Observations | 936 | 936 | 936 | 936 | 936 |
| Adjusted R-squared | 0.960 | 0.960 | 0.960 | 0.960 | 0.960 |
| Country FE | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
^2019 figures

8.52 Table 2 reports panel Fixed Effects (FE) regression results for dependant variable Log Knowledge & Technology Output rank for five models with different independent variables - Log input pillars, Log GDP, Log GDP per capita and Log population. Among the input pillars, it shows that Log Business Sophistication rank is significant and positively correlated with Log Knowledge & Technology Output rank, controlling for other pillars, income and population. It also shows that Log Human Capital & Research rank is significant and negatively correlated with Log Knowledge & Technology Output rank, controlling for other pillars, income and population. This suggests the potential for higher business sophistication to lead to better performance in knowledge & technology outputs.

**Table 2: Panel Regression Results: Fixed Effects**

| **Dependant Variable: Log Knowledge & Technology Output rank** | | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| **VARIABLES** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** |
| Log Institutions rank | 0.0409 | 0.0339 | 0.0287 | 0.0303 | 0.0283 |
| | (0.0514) | (0.0511) | (0.0507) | (0.0508) | (0.0506) |
| Log HCR rank | -0.0935** | -0.0948** | -0.0920** | -0.0938** | -0.0919** |
| | (0.0399) | (0.0400) | (0.0408) | (0.0400) | (0.0408) |
| Log Infrastructure rank | 0.0204 | 0.0158 | 0.0142 | 0.0142 | 0.0140 |
| | (0.0377) | (0.0374) | (0.0374) | (0.0374) | (0.0374) |
| Log Market Sophistication | -0.0220 | -0.0215 | -0.0196 | -0.0205 | -0.0194 |
| rank | (0.0373) | (0.0371) | (0.0372) | (0.0370) | (0.0372) |
| Log Business Sophistication | 0.134*** | 0.132*** | 0.130*** | 0.131*** | 0.129*** |
| rank | (0.0429) | (0.0427) | (0.0433) | (0.0428) | (0.0433) |
| Log GDP (PPP)^ | | -0.0666 | -0.110 | | |
| | | (0.0678) | (0.0969) | | |

| | | | | | |
|---|---|---|---|---|---|
| Log Population^ | | | 0.231 | | 0.125 |
| | | | (0.314) | | (0.253) |
| Log GDP per capita (PPP)^ | | | | -0.0982 | -0.114 |
| | | | | (0.0847) | (0.0968) |
| Observations | 936 | 936 | 936 | 936 | 936 |
| Adjusted R-squared | 0.948 | 0.948 | 0.948 | 0.948 | 0.948 |
| Country FE | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
^2019 figures

8.53 Table 3 reports panel Fixed Effects (FE) regression results for dependant variable Log Creative Output rank for five models with different independent variables - Log input pillars, Log GDP, Log GDP per capita and Log population. Among the input pillars, it shows that Log Institutions and Log Business Sophistication ranks are significant and positively correlated with Log Creative Output rank, controlling for other pillars, income and population. Population, when included, was found significant and positively correlated with Log Creative Output rank, controlling for other pillars and income. Log GDP and Log GDP per capita, when included with population, were found significant and negatively correlated with Log Creative Output rank, controlling for other pillars. This suggests that improvements in institutions and business sophistication could lead to higher creative output performance. Higher income is also expected to lead to better performance in creative outputs, and hence ranks closer to one (thereby reflecting a negative correlation).

**Table 3: Panel Regression Results: Fixed Effects**

| **Dependant Variable: Log Creative Output rank** | | | | | |
|---|---|---|---|---|---|
| **VARIABLES** | (1) **Model 1** | (2) **Model 2** | (3) **Model 3** | (4) **Model 4** | (5) **Model 5** |
| Log Institutions rank | 0.160** | 0.150** | 0.130* | 0.140** | 0.130* |
| | (0.0695) | (0.0702) | (0.0702) | (0.0702) | (0.0702) |
| Log HCR rank | 0.0327 | 0.0308 | 0.0412 | 0.0322 | 0.0414 |
| | (0.0602) | (0.0600) | (0.0590) | (0.0595) | (0.0590) |
| Log Infrastructure rank | -0.0598 | -0.0669 | -0.0730 | -0.0717 | -0.0729 |
| | (0.0802) | (0.0813) | (0.0809) | (0.0810) | (0.0809) |
| Log Market Sop rank | 0.00327 | 0.00411 | 0.0113 | 0.00618 | 0.0115 |
| | (0.0451) | (0.0449) | (0.0447) | (0.0448) | (0.0447) |
| Log Business Sop rank | 0.0766** | 0.0736** | 0.0634* | 0.0697* | 0.0631* |
| | (0.0365) | (0.0364) | (0.0363) | (0.0363) | (0.0364) |
| Log GDP (PPP)^ | | -0.103 | -0.267*** | | |
| | | (0.0775) | (0.0986) | | |

| | | | | | |
|---|---|---|---|---|---|
| Log Population^ | | | 0.871*** | | 0.604** |
| | | | (0.304) | | (0.255) |
| Log GDP per capita (PPP)^ | | | | -0.189** | -0.267*** |
| | | | | (0.0917) | (0.0985) |
| Observations | 936 | 936 | 936 | 936 | 936 |
| Adjusted R-squared | 0.918 | 0.918 | 0.919 | 0.918 | 0.919 |
| Country FE | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
^2019 figures

## POLICY IMPLICATIONS

8.54 India needs greater thrust on innovation to catapult itself to a higher growth trajectory and become the third largest economy in GDP current US$ in the near future. This requires boosting gross expenditure on R&D from 0.7 per cent of GDP currently, to at least the average level of GERD in other top ten economies (GDP current US$) of over two per cent. It also involves significantly scaling up R&D personnel and researchers in the country, especially in the private sector.

8.55 Despite heavy lifting by the government sector in GERD of almost three times the average of other top ten economies, India's GERD remains low. Moreover, India's performance on innovation has been lower than expected for its level of access to equity finance. India's business sector needs to rise to the occasion and significantly ramp up its gross expenditure on R&D to a level commensurate to India's status as the fifth largest economy in GDP current US$. This requires boosting business sector contribution to total GERD from 37 per cent currently, to close to 68 per cent – the average business contribution in GERD of other top ten economies. Indian business sector's contribution to total R&D personnel and researchers also needs to be scaled up from 30 per cent and 34 per cent per cent respectively to the average level in other top ten economies (58 per cent and 53 per cent respectively).

8.56 India has had a generous tax incentive structure to boost R&D in the country as compared to several other top ten economies. However, this did not generate a corresponding level of private participation in GERD in India. Given the low level of contribution to GERD by the business sector despite the generous incentive regime prevailing earlier, businesses in India must focus on innovation to remain competitive in the new economy.

8.57 For India to become an innovation leader, its residents' share in total patent applications filed in the country must rise from the current level of 36 per cent. As a thought experiment, assume that the number of non-resident patent applications in India remain the same from 2019 to 2030. Then, if India's share of resident patents were to rise from 36 per cent in 2019 to the average share of resident patents in total patent applications amongst the other top 10 economies (62 per cent) by 2030, resident patents would have to increase at a CAGR of 9.8 per cent. While ambitious, this has been achieved by another country - China's resident patents have increased at a CAGR of 21 per cent from 2000 to 2019 and at a CAGR of 16 per cent from 2010 to 2019.

8.58 India should focus on improving its performance on institutions and business sophistication since higher performance on these dimensions seem to consistently suggest higher innovation outputs performance (Tables 1-3). The importance of institutions for innovation is consistent with an emerging literature that emphasizes the same (see Acharya and Subramanian, 2009; Acharya et al. 2013, 2014, Sapra et al. 2014). Table 4 highlights some areas that India could focus on within the institutions and business sophistication input pillars to further augment its performance in innovation outputs.

**Table 4: Suggested Focus Areas for boosting Innovation Performance**

| Input Pillar and Potency of Expected Impact | Build on strengths | Improve |
|---|---|---|
| **Institutions**<br><br>**Potency of potential impact:** One standard deviation improvement in Institutions rank from 61 in 2020 to 23 is expected to increase overall Innovation Output rank to 40 from 45 in 2020 | • Ease of resolving insolvency (rank 47)<br>• Government effectiveness (rank 55) | • Ease of starting a business (rank 105)<br>• Political and operational stability (rank 83)<br>• Regulatory quality (rank 84)<br>• Rule of law (rank 62)<br>• Cost of redundancy dismissal (rank 61) |
| **Business Sophistication**<br><br>**Potency of potential impact:** One standard deviation improvement in Business Sophistication rank from 55 in 2020 to 17 is expected to increase overall Innovation Output rank to 42 from 45 in 2020 | • Intellectual Property payments as % of total trade (rank 27)<br>• High-tech imports as % of total trade (rank 29)<br>• % of Firms offering formal training (rank 37)<br>• State of cluster development (rank 37)<br>• Research talent, % in business enterprise (rank 38)<br>• University/Industry research collaboration (rank 45)<br>• JV-strategic alliance deals/ bn PPP$ GDP (rank 47)<br>• Patent families 2+ offices/ bn PPP$ GDP (rank 47)<br>• % GERD financed by business (rank 48) | • % of Females employed with advanced degrees (rank 101)<br>• FDI net inflows as % of GDP (rank 92)<br>• % of Knowledge intensive employment (rank 90) |

8.59 As Economic Survey 2019-20 discussed in the chapter "Entrepreneurship and Wealth Creation at the Grassroots", the Startup India campaign of the Government of India recognises entrepreneurship as an increasingly important strategy to fuel productivity growth and

wealth creation in India. This assumes greater importance in the context of enhancing private participation in innovation in India - in terms of contribution to gross expenditure on R&D, R&D personnel and researchers, and share in patents filed in the country. The lessons drawn therein on the crucial role of literacy, education, physical infrastructure and policies enabling ease of doing business, as drivers of new firm creation and entrepreneurship, remain relevant in this analysis.

## CHAPTER AT A GLANCE

- India entered the top 50 innovating countries for the first time in 2020 since the inception of the Global Innovation Index in 2007, by improving its rank from 81 in 2015 to 48 in 2020. India ranks first in Central and South Asia, and third amongst lower middle-income group economies.
- For India to become an innovation leader, it needs greater thrust on innovation. India's aspiration must be to compete on innovation with the top ten economies. India's gross domestic expenditure on R&D (GERD) is lowest amongst other largest economies. The government sector contributes a disproportionate large share in total GERD at three times the average of other largest economies. However, the business sector's contribution to GERD is amongst the lowest. The business sector's contribution to total R&D personnel and researchers also lags behind that in other large economies. This situation has prevailed despite the tax incentives for innovation having been more liberal than other economies. India's innovation ranking is much lower than expected for its level of access to equity capital. This points towards the need for India's business sector to significantly ramp up investments in R&D.
- Indian residents' share in total patents filed in the country stands at 36 per cent. This lags behind the average of 62 per cent in other largest economies. Resident share in patent applications must rise for India to become an innovative nation.
- India must focus on improving its performance on institutions and business sophistication innovation inputs. These are expected to result in higher improvement in innovation output.

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# JAY Ho: Ayushman Bharat's Jan Arogya Yojana (JAY) and Health Outcomes

**09**

**CHAPTER**

**Of all the forms of inequality, injustice in healthcare is the most shocking and most inhuman.**

**—Martin Luther King Jr.**

*This chapter demonstrates strong positive effects on healthcare outcomes of the Pradhan Mantri Jan Arogya Yojana (PM-JAY) – the ambitious program launched by Government of India in 2018 to provide healthcare access to the most vulnerable sections. PM-JAY is being used significantly for high frequency, low cost care such as dialysis and continued to be utilised without disruption even during the Covid pandemic and the lockdown. General medicine – the overwhelmingly major clinical specialty accounting for over half the claims - exhibited a V-shaped recovery after falling during the lockdown and reached pre-COVID-19 levels in December 2020. The final – but the most crucial – analysis in the chapter attempts to estimate the impact of PM-JAY on health utcomes by undertaking a difference-in-difference analysis. As PM-JAY was implemented in 2018, health indicators measured by National Family Health Surveys 4 (in 2015-16) and 5 (in 2019-20) provide before-after data to assess this impact. To mitigate the impact of various confounding factors, we compute a difference-in-difference by comparing states that implemented PM-JAY versus those that did not. We undertake this analysis in two parts. First, we use West Bengal as the state that did not implement PM-JAY and compare its neighbouring states that implemented PM-JAY – Bihar, Sikkim and Assam. Second, we repeat the same analysis for all states that did not implement PM-JAY vis-à-vis all states that did.*

*PM-JAY enhanced health insurance coverage. Across all the states, the proportion of households with health insurance increased by 54 per cent for the states that implemented PM-JAY while falling by 10 per cent in states that did not. Similarly, the proportion of households that had health insurance increased in Bihar, Assam and Sikkim from 2015-16 to 2019-20 by 89 per cent while it decreased by 12 per cent over the same period in West Bengal. From 2015-16 to 2019-20, infant mortality rates declined by 12 per cent for states that did not adopt PM-JAY and by 20 per cent for the states that adopted it. Similarly, while states that did not adopt PM-JAY saw a fall of 14 per cent in its Under-5 mortality rate, the states that adopted it witnessed a 19 per cent reduction. While states that did not adopt PM-JAY witness 15 per cent decline in unmet need for spacing between consecutive kids, the states that adopted it recorded a 31 per cent fall. Various metrics for mother and child care improved more in the states that adopted PM-JAY as compared to those who did not. Each of these health effects manifested similarly when we compare Bihar, Assam and Sikkim that implemented PM-JAY versus West Bengal that did not. While some of*

*these effects stemmed directly from enhanced care enabled by insurance coverage, others represent spillover effects due to the same. Overall, the comparison reflects significant improvements in several health outcomes in states that implemented PM-JAY versus those that did not. As the difference-in-difference analysis controls for confounding factors, the Survey infers that PM-JAY has a positive impact on health outcomes.*

## INTRODUCTION

9.1 As free markets under-provision public goods, a vital role of a government is to provide public goods to its citizens, especially to the vulnerable sections in a society. While the rich can seek private alternatives, lobby for better services, or if need be, move to areas where public goods are better provided for, the poor rarely have such choices (Besley and Ghatak, 2004). Thus, provision of public goods can particularly affect the quality of living of the vulnerable sections in a society. Yet, governments may suffer from the "horizon problem" in a democracy, where the time horizon over which the benefits of public goods reach the electorate may be longer than the electoral cycles (Keefer 2007 and Keefer and Vlaicu 2007). The myopia resulting from the horizon problem may again lead to under-provisioning of public goods. Therefore, the provision of public goods that generate long-term gains to the economy and the society represents a key aspect of governance in a democratic polity.

9.2 As healthcare represents a critical public good, successive governments have committed to achieve universal health coverage (UHC). However, until 2018, UHC remained an elusive dream. In 2018, Government of India approved the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PM-JAY) as a historic step to provide healthcare access to the most vulnerable sections in the country. Beneficiaries included approximately 50 crore individuals across 10.74 crores poor and vulnerable families, which form the bottom 40 per cent of the Indian population. The households were included based on the deprivation and occupational criteria from the Socio-Economic Caste Census 2011 (SECC 2011) for rural and urban areas respectively. The scheme provides for healthcare of up to INR 5 lakh per family per year on a family floater basis, which means that it can be used by one or all members of the family. The scheme provides for secondary and tertiary hospitalization through a network of public and empanelled private healthcare providers. It also provides for three days of pre-hospitalization and 15 days of post-hospitalization expenses, places no cap on age and gender, or size of a family and is portable across the country. It covers 1573 procedures including 23 specialties (see Box 1 for details). AB-PM-JAY also aims to set up 150,000 health and wellness centres to provide comprehensive primary health care service to the entire population.

9.3 The evidence provided in this chapter shows strong positive effects of PM-JAY on healthcare outcomes despite the short time since introduction of the programme. First, PM-JAY is being used significantly for high frequency and low cost care consisting with the general utilisation of healthcare services. Using the distribution of claims, we find that the distribution is a long-tailed one that peaks in the range of INR 10,000-15,000. The highest number of pre-authorization claims received were for procedures that cost in this range. The distribution is heavily right-tailed indicating significantly fewer claims for more expensive procedures.

9.4 Second, general medicine has been the overwhelmingly major clinical specialty used since 2018 with its share continuously growing. It is followed by general surgery, obstetrics and gynaecology. These three categories combine to account for more than half of the claims received on average. Dialysis – high frequency, low cost procedure that is life-saving for patients with renal difficulties – accounts for a large chunk (30 per cent) of the general medicine category claims under PM-JAY.

9.5 Third, the claims for dialysis did not diminish due to COVID-19 or because of the lockdown in March-April 2020 even while we can observe a steep fall in claims under the overall general medicine category during the lockdown. This highlights the users' reliance on PM-JAY for the life-saving dialysis procedure. Thus, the critical, life-saving health procedures such as dialysis seem to have not been severely affected during the COVID-19 pandemic.

9.6 Fourth, general care-seeking as seen in the PM-JAY claims exhibited a V-shaped recovery after falling during the lockdown and has reached the pre-COVID-19 levels in December 2020.

9.7 The final, but the most crucial, analysis in the chapter attempts to estimate the **impact** of PM-JAY on health outcomes by undertaking a difference-in-difference analysis. We compare the health indicators measured by National Family Health Survey 4 (NFHS 2015-16) and the National Family Health Survey 5 (NFHS 2019-20) to undertake this analysis. As PM-JAY was implemented in 2018, these two surveys provide before-after data to assess the impact of PM-JAY with the NFHS-4 serving as the baseline to compare the changes using NFHS-5. To mitigate the impact of various confounding factors, including but not limited to secular improvements in health indicators across the country, we undertake this analysis by calculating a difference-in-difference.

9.8 This analysis is undertaken in two parts. In the first part, we use West Bengal as the state that did not implement PM-JAY and compare the before-after difference in health outcomes to its neighbouring states that have implemented PM-JAY – Bihar, Sikkim and Assam. Apart from all these states being contiguous to each other and therefore being similar on socio-economic dimensions, we show that the baseline characteristics of these two groups of states were similar. In the second part, we repeat the same analysis for all states that did not implement PM-JAY vis-à-vis all states that implemented PM-JAY. Of course, the heterogeneity across the entire group of states in the country is large. The second analysis is less of a like-for-like comparison than the first one. Combining the findings from both these comparisons ensures that the findings are robust not only to a more localised, and therefore, more careful comparison but also to a comparison that spans all the major states in the country. The findings from this analysis are summarised as follows:

1. The proportion of households that had health insurance increased in Bihar, Assam and Sikkim from 2015-16 to 2019-20 by 89 per cent while it decreased by 12 per cent over the same period in West Bengal. When comparing across all the states over this time period, we find that the proportion of households with health insurance increased by 54 per cent for the states that implemented PM-JAY while falling by 10 per cent in the states that did not adopt PM-JAY. Thus, PM-JAY enhanced health insurance coverage.
2. From 2015-16 to 2019-20, infant mortality rates declined by 20 per cent for West Bengal and by 28 per cent for the three neighbouring states. Similarly, while Bengal saw a fall of 20 per cent in its Under-5 mortality rate, the neighbours witnessed a 27 per cent reduction. Thus,

the neighbouring states witnessed 7-8 per cent greater reduction in these health outcomes.

3. Modern methods of contraception, female sterilization and pill usage went up by 36 per cent, 22 per cent and 28 per cent respectively in the three neighbouring states while the respective changes for West Bengal were negligible. While West Bengal did not witness any significant decline in unmet need for spacing between consecutive kids, the neighbouring three states recorded a 37 per cent fall.
4. Various metrics for mother and child care improved more in the three neighbouring states than in West Bengal.
5. Each of the effects described above (points 2-4) manifested similarly when we compare all states that implemented PM-JAY versus the states that did not.

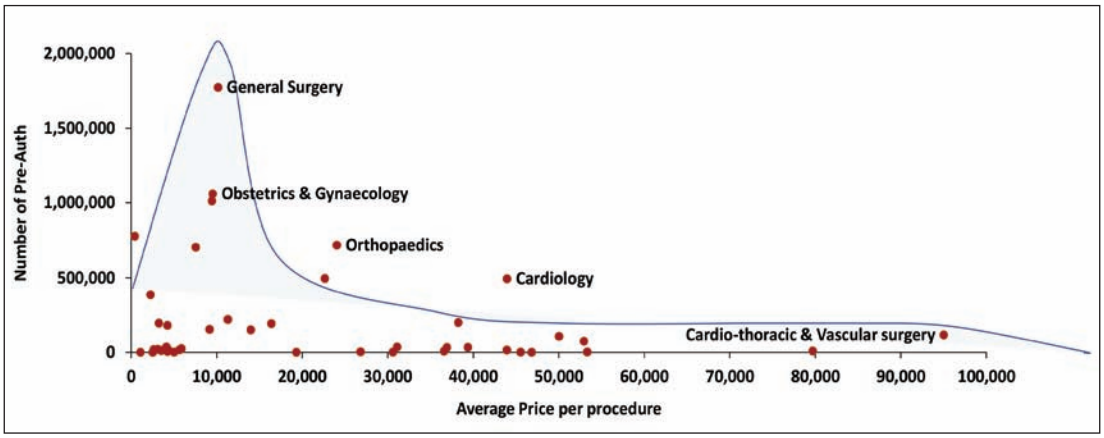
9.9 Overall, the comparison reflects significant improvements in several health outcomes in states that implemented PM-JAY versus those that did not. As the difference-in-differnce analysis controls for various compounding factors, the Survey infers that PMJAY impacted health outcomes positively.

## PM-JAY: STATUS AND PROGRESS SO FAR

9.10 As per the latest annual report of PM-JAY released by the National Health Authority (NHA, 2019), the status of implementation is as follows:

- 32 states and UTs implement the scheme
- 13.48 crore E-cards have been issued
- Treatments worth INR 7,490 crore have been provided (1.55 crores hospital admission)
- 24,215 hospitals empaneled
- 1.5 crore users have registered on the scheme's website (mera.pmjay.gov.in)

**Figure 1: The distribution in utilization of various procedures**



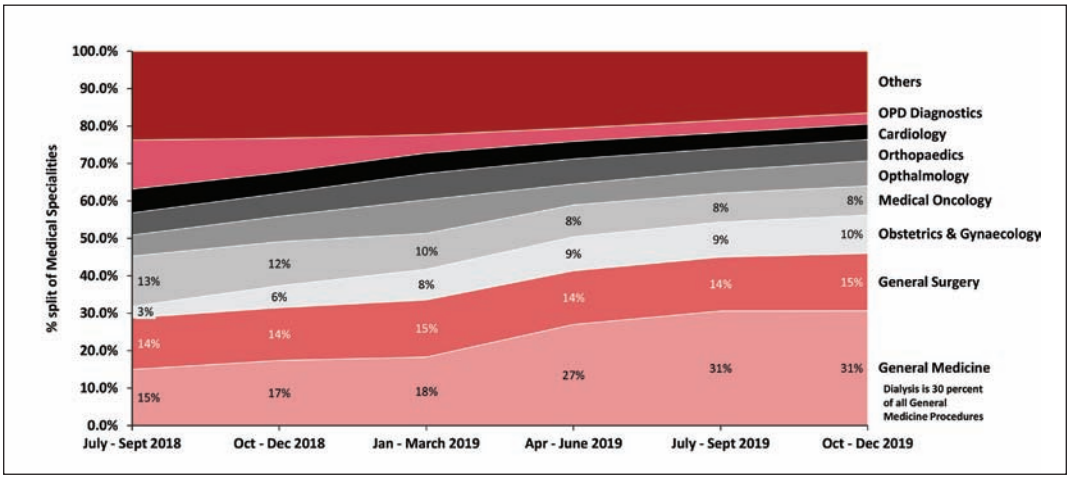

Source: NHA data secured from PMJAY

9.11 Figure 1 plots the number of PM-JAY pre-authorizations claims for a procedure against the average price of the procedure for the time period September 2018 through January 2021 (till January 13, 2021). The distribution is a long-tailed one that peaks in the range of INR 10,000-15,000. The highest number of pre-authorization claims received were for procedures

that cost in this range. The distribution is heavily right tailed indicating relatively fewer claims for more expensive procedures. The high number of claims for low cost procedures could be indicative of people utilizing PM-JAY as a delivery channel for primary healthcare services.

9.12 Figure 2 details the share of overall PM-JAY claims by the nature of clinical specialty over July-September 2018 to October-December 2019.

**Figure 2: Share of claims by clinical specialty**




Source: NHA data secured from PMJAY

9.13 General medicine has been the overwhelmingly major clinical specialty used since 2018 with its share continuously growing. It is followed by general surgery and obstetrics and gynaecology. These three categories combined made up close to 56 per cent of claims received in October-December 2019. An important caveat to note here is that Dialysis itself comprises a large chunk (30 per cent) of the 'general medicine' category claims under PM-JAY. This is despite the fact that the Pradhan Mantri National dialysis Programme, which was rolled out in 2016, also provides free dialysis to kidney patients in district hospitals. According to data from the National Health Ministry, every year, about 2.2 lakh new patients with end stage renal disease get added in India, resulting in additional demand for 3.4 crore dialysis every year (Ghosh 2016). These facts corroborate India's growing burden of non-communicable diseases in the form of hypertension and kidney disease.

**Box 1: Specialties, Packages and Procedures in PM-JAY**

| Specialty | Packages | Procedures |
|---|---|---|
| Burns Management | 6 | 20 |
| Cardiology | 20 | 26 |
| Cardio-thoracic & Vascular surgery | 34 | 113 |
| Emergency Room Packages | 3 | 4 |

| | | |
|---|---|---|
| General Medicine | 76 | 98 |
| General Surgery | 98 | 152 |
| Interventional Neuroradiology | 10 | 15 |
| Medical Oncology | 71 | 263 |
| Mental Disorders Packages | 10 | 10 |
| Neo-natal care Packages | 10 | 10 |
| Neurosurgery | 54 | 82 |
| Obstetrics & Gynecology | 59 | 77 |
| Ophthalmology | 40 | 53 |
| Oral and Maxillofacial Surgery | 7 | 9 |
| Orthopedics | 71 | 132 |
| Otorhinolaryngology | 35 | 78 |
| Pediatric Medical Management | 46 | 65 |
| Pediatric Surgery | 19 | 35 |
| Plastic & Reconstructive Surgery | 8 | 12 |
| Polytrauma | 10 | 21 |
| Radiation Oncology | 14 | 35 |
| Surgical Oncology | 76 | 120 |
| Urology | 94 | 143 |
| Unspecified Surgical Package | 1 | 1 |
| Total | 872 | 1,574 |

## PUBLIC GOODS, DEMOCRACIES AND GOVERNANCE

9.14 Samuelson (1954) conceptualised certain goods as "public goods" and argued that that "no decentralized pricing system can serve to optimally determine these levels of collective consumption (of the public good)." As public goods are non-rival and non-excludable, market failures predominate in the provision of such goods. The decentralised free market system that works through prices cannot force consumers to reveal their demand for purely non-excludable goods, and so cannot lead to producers meeting that demand. Also, given their non-rivalry, private producers cannot make the requisite profits to justify investing in such goods. Therefore, public goods may get severely under-produced without intervention by a government.

9.15 Since public goods are not adequately provided for by the markets, they must be supplied by the government. Therefore, provisioning for public goods and ensuring their supply represents one of the most important functions of a government. Access to safe drinking water, sanitation, transport, medical care, and schools is essential both as a direct component of well-being as well as inputs into productive capabilities. Besley and Ghatak (2004) argue that the rich have the option to seek private alternatives, lobby for better services, or if need be, move to different areas. The poor do not have such choices, which accentuates their deprivation when public goods are not provided for especially to the vulnerable sections of society. The presence of strong linkages between public goods provision and economic development accentuates the need

for the provision of public good at national, regional and international levels (UNIDO 2008). Governance therefore entails effective delivery of public goods and services to the vulnerable sections of society.

9.16 Despite the importance of the delivery of public goods, governments may suffer from the "horizon problem" in democracies, where the time horizon over which the benefits of public goods reach the electorate may be longer than the electoral cycles. The myopia that this creates may, therefore, lead to under-provisioning of public goods by governments. Research in political economy, for instance, shows that democratic rulers are often short-sighted due to the constant political challenge presented through electoral cycles. As a result, many democratically elected governments can focus only on short-term gains rather than commit to long-term projects (Keefer 2007 and Keefer and Vlaicu 2007). Therefore, the provision of public goods that generate long-term gains to the economy and the society represents a key aspect of governance in a democratic polity.

**Box 2: The impact of health insurance coverage on health outcomes in other countries**

Healthcare represents one such critical public good. Countries are increasingly adopting the policy of universal healthcare to reduce inequalities in healthcare provision which is strongly related to inequality of income (Amado 2020). Hoffman and Paradise (2008) find that in the United States, there exist strong interconnections between health insurance coverage, poverty and health. Analysing the impact of Medicaid[1] and SCHIP[2], they suggests that health insurance coverage provided by the government is vital in providing for better health care and health outcomes. Moreover, the extensive literature citing the ill effects of being uninsured in the US makes the case for the public provision of health care insurance.

Ayanian et al. (2000) posits that the likelihood of receiving basic preventive services such as breast cancer screening (64 per cent versus 89 per cent) and hypertension screening (80 per cent versus 94 per cent) was much lower for the uninsured working adults. Similarly, 40 per cent of the uninsured adults did not undergo a routine checkup in the last two years as compared to 185 of insured adults. Further studies illustrates that individuals who lack insurance coverage not only suffers on account of lack of access to care but also bear the burden in terms of worse health outcomes (Hoffman and Pradise 2008. Szilagyi et al, (2006) postulates that children from the low-income group suffering from asthma who were newly enrolled in SCHIP, underwent less number of asthma attacks, reduced rate of hospitalization and less number of visits to the emergency department in the year following the enrollment as compared to the year before enrollment.

Furthermore, access to government healthcare initiatives such as Medicaid and CHIP[3] has resulted into remarkable benefits for children and their families for example, receiving essential health services, long term benefits of better health status, greater academic development and higher future earnings[4].

[1] Medicaid (1965): a public health insurance programme in the US providing health care coverage to low-income families or individuals.
[2] The State Children's Health Insurance Program (SCHIP) (1997) is a US government scheme providing insurance coverage for children whose families earn too much to qualify for Medicaid, but cannot afford private coverage.
[3] Children's Health Insurance Program, formerly known as The State Children's Health Insurance Program (SCHIP)
[4] Center on Budget and Policy Priorities, "Medicaid Works for Children."

These programs have also been able to target racial disparities in health care, with African American and Hispanic children constituting 58 per cent[5] of the children covered under these programs. Also, the likelihood of financial insecurity, medical debt or bankruptcy is reduced if the families have access to these insurance programs (Medicaid and CHIP).[6] Therefore, medical insurance coverage under Medicaid and CHIP allowed for greater financial stability alongside improving child's educational attainment and future earnings.[7] The insurance coverage of the parents tends to be positively correlated with children's benefit as child's health is directly influenced by the health of his parents, with healthy parents leading to positive childhood developments.[8]

The adoption of Seguro Popular (Popular Public Health Insurance Program) in Mexico, enabled massive growth in insurance coverage across the country, becoming the second largest health institution by coverage in few years (Urquieta-Salomon and Villarreal 2016. This program allowed for a five times increase in the proportion of insured poor families (Frenk et al, 2006). Consequently, the proportion of Mexican population with no insurance coverage remained very low, at 18 per cent in 2015 (Doubova (2015)).

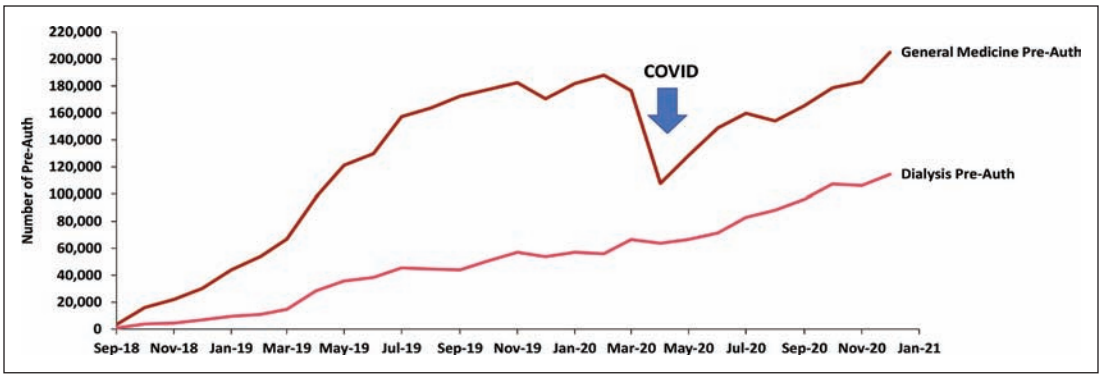
In 2001, Thailand became the first lower-middle income country to introduce universal health coverage reforms, replacing the old means-tested health care for low income households with a more comprehensive co-payment[9] insurance scheme, called the '30 Baht Project' (World Bank 2012). The 30 Baht scheme was later replaced with UHC with no co-payment While these reforms were criticised to a great extent, they proved popular among the poorer Thais, primarily in the rural areas.[10] As a result of its robust healthcare system, Thailand became the first Asian country to eliminate HIV transmission from mother to child in 2016 (CNN 2016).

## PM-JAY AND COVID-19

9.17. Two key facts are worth noting. First, as we discussed before, dialysis is a common procedure availed under PM-JAY. Its use did not diminish at the onset of COVID-19 or during the lockdown (March-April 2020) even though we can observe a steep fall in claims under the overall general medicine category in the same period. This highlights the users' reliance on PM-JAY or the life-saving dialysis procedure. Thus, the critical, life-saving health procedures such as dialysis seem to have not been severely affected during the COVID-19 pandemic. Figure 3a presents the trends in the volume of pre-authorized claims starting July 2018.

[5]Center on Budget and Policy Priorities, "Medicaid Works for Children."
[6]Brooks and Whitener, "Medicaid and CHIP 101."
[7]Center on Budget and Policy Priorities, "Medicaid Works for Children," January 19, 2018, available at https://www.cbpp.org/research/health/medicaid-works-for-children
[8]Georgetown University Health Policy Institute Center for Children and Families, "Health Coverage for Parents and Caregivers Helps Children" (Washington: 2017), available at https://ccf.georgetown.edu/wp-content/uploads/2017/03/Covering-Parents-v2.pdf
[9]Co-payment mechanism was abolished in 2008
[10]The Universal Coverage Policy of Thailand: An Introduction Archived 2012-01-19 at the Wayback Machine

**Figure 3a: Number of pre-authorised claims July 2018-January 2021**



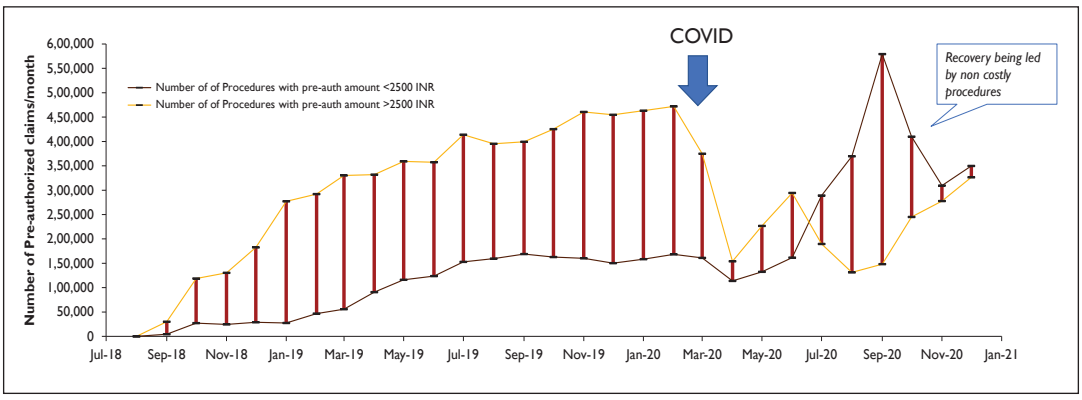

Source: NHA data secured from PMJAY. Data for January 2021 is till 13-Jan-2021.

9.18 Second, the number of dialysis claims have only been growing. This fact highlights that the National Dialysis Mission could be merged with PM-JAY.

9.19 Third, while access to medical services were classified as essential services during the lockdown, care-seeking exhibited a V-shaped behaviour during the lockdown and unlock phases with the pre-COVID-19 levels being reached in December 2020.[11] The V-shaped behaviour is likely to be due to both demand and supply side effects. On the supply side, health care workers might have cut back on services out of initial fear of infection or it is possible that pre-authorization processes were skipped. Further, many private hospitals were not providing services for fear of infection and government hospitals were reserved for COVID-19 patients. On the demand side, patients avoided hospitals due to fear of contracting the virus, or their access to medical services could have been impeded by lack of transport or finances during the lockdown. Both the demand and supply side factors seem to have since recovered completely during the unlock phase. Further, recovery in private sector hospitals in much better than the public empaneled healthcare providers (EHCP).

9.20 Next, figure 3b plots the gap between volume of pre-authorised claims which are <2500 INR and >2500 INR.

**Figure 3b: Gap between volume of pre-authorised claims and the pre-authorised amount of INR 10,000**




Source: NHA data secured from PMJAY

[11]PM-JAY policy brief: https://pmjay.gov.in/sites/default/files/2020-06/Policy-Brief-8_PM-JAY-under-Lock-down-Evidence_12-06-20_NHA_WB.pdf

9.21 It is interesting to note that pre-authorized volumes of claims >INR 2500 significantly exceeded the pre-authorised volumes of claims < INR 2500 before COVID-19. This gap suggests a strong preference for costly procedures and tertiary care early into the adoption cycle of PM-JAY up until the distruption caused by the COVID-19 pandemic. After the COVID-19 pandemic distruption, there is a reversal of this trend with the number of pre- authorised claims which are <2500 INR exceeding the the number of pre-authorised claims claims >2500 INR. This is indicative of an increase in the utilization of PM-JAY for non-costly procedures and PM-JAY even being used as a substitute for primary care.

## PM-JAY AND HEALTH OUTCOMES: DIFFERENCE-IN-DIFFERENCE CALCULATIONS

9.22 In this section we explore whether access to the PM-JAY scheme has had any significant impact on the health outcomes. We compare the health indicators measured by National Family Health Survey-4 (NFHS 2015-16) and the National Family Health survey 5 (NFHS 2019-20) to undertake this analysis. As PM-JAY was implemented in 2018, these two surveys provide before-after data to assess the impact of PM-JAY with the NFHS-4 serving as the baseline to compare the changes using NFHS-5. To mitigate the impact of various confounding factors, including but not limited to secular improvements in health indicators across the country, we undertake this analysis by estimating a difference-in-difference. The Economic Surveys of 2018-19 and 2019-20 have discussed the econometric benefits of this technique to account for various confounding factors and thereby assess the impact of a policy change on outcomes. We refer readers to these surveys for technical details. In essence, we compute the before-after difference in outcomes for a state or group of states that implemented PM-JAY and compare the same before-after difference in a state or group of states that did not implement PM-JAY. The latter difference provides an estimate for the counter-factual: what would have been the before-after difference in outcomes for the state or group of states that implemented PM-JAY if they had not implemented PM-JAY. Thus, by comparing the former difference with the latter difference, we can reasonably attribute the difference-in-difference to be the impact of PM-JAY.

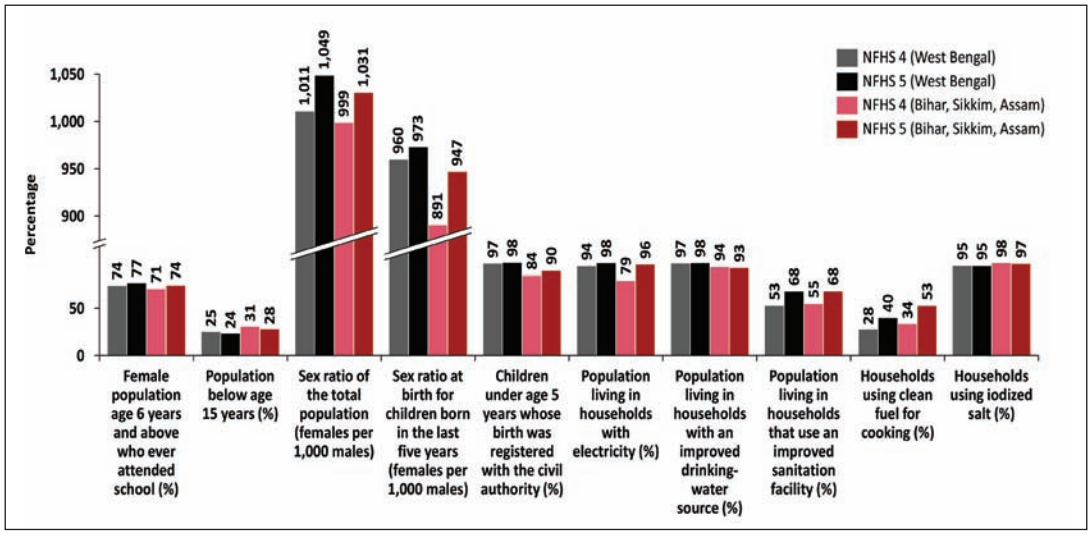
9.23 We undertake this analysis in two parts. In the first part, we use West Bengal as the state that did not implement PM-JAY and compare the before-after difference in health outcomes to its neighbouring states that have implemented PM-JAY – Bihar, Sikkim and Assam. Apart from all these states being contiguous to each other and therefore being similar on socio-economic dimensions, we show that the baseline characteristics of these two groups of states were similar.

9.24 In the second part, we repeat the same analysis for all states that did not implement PM-JAY vis-à-vis all states that implemented PM-JAY. Of course, the heterogeneity across the entire group of states in the country is large. The second analysis is less of a like-for-like comparison than the first one. Combining the findings from both these comparisons ensures that the findings are robust not only to a more localised, and therefore, more careful comparison but also to a comparison that spans all the major states in the country.

### Comparing West Bengal versus its neighbours (Bihar, Sikkim, Assam)

9.25 We first compare West Bengal with its neighbours in key demographic and household characteristics across the time span of NFHS 4 and NFHS 5. Figure 4 presents this comparison.

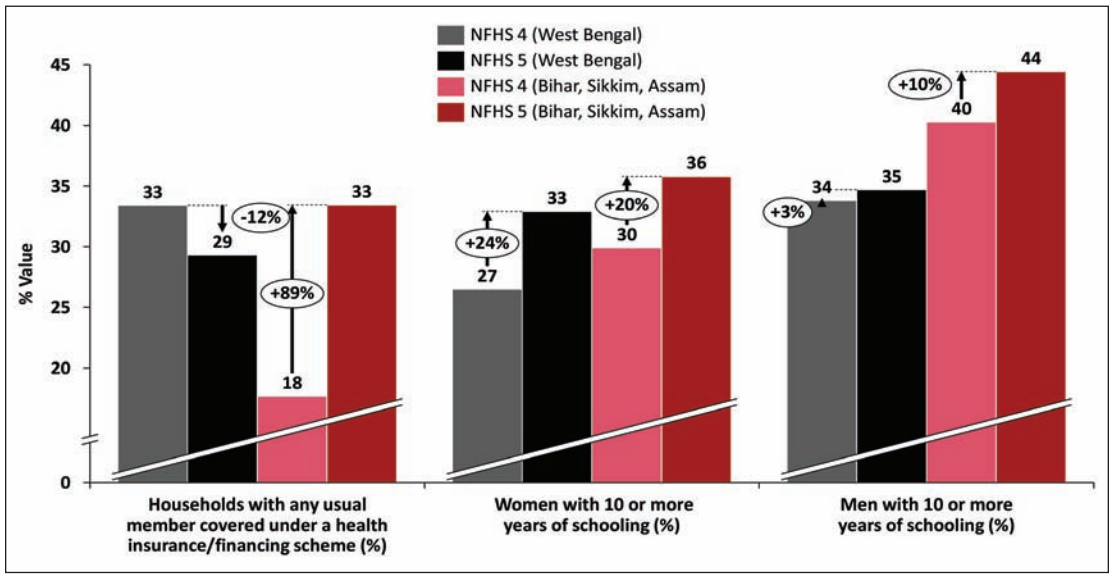
**Figure 4: Population and Household trends: West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

9.26 West Bengal, Bihar, Assam and Sikkim share similar demographic characteristics. The only noteworthy difference emerges in the sex ratios at birth. While both West Bengal and the neighbouring three states improved on this front, the rise was higher for the neighbours than for West Bengal. From NHFS 4 to NFHS 5, West Bengal's sex ratio at birth improved by 1.35 per cent while the corresponding improvement for the three neighbours was 6.28 per cent. Among the other characteristics, Figure 5 shows that women with 10 or more years of schooling increased in all four states with the increase in West Bengal being higher at 24 per cent than that in Bihar, Assam and Sikkim at 20 per cent. In contrast, while men with 10 or more years of schooling increased in all four states, the increase in West Bengal was lower at 3 per cent than that in Bihar, Assam and Sikkim at 10 per cent.

**Figure 5: Characteristics of adults (15-49 years): West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**

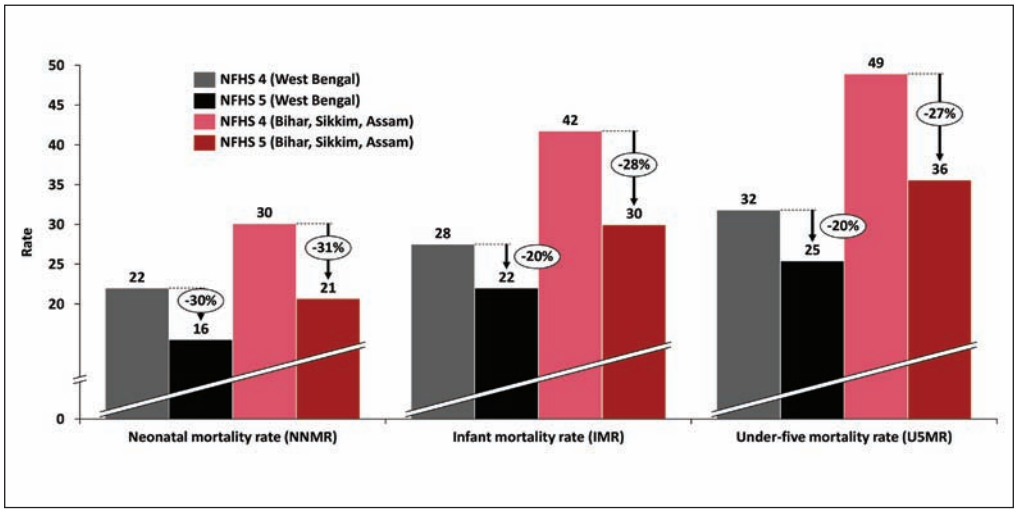



Source: National Family Health Survey (NFHS) 4 and 5

9.27 Crucially, the proportion of population that had health insurance increased from NHFS 4 to NFHS 5 in Bihar, Assam and Sikkim by 89 per cent. The corresponding change in West Bengal was -12 per cent. As the PM-JAY was launched in 2018 and NHFS 4 and NFHS 5 cover the pre- and post-PM-JAY periods respectively, the significant increase in health insurance coverage in Bihar, Assam and Sikkim can be attributed to the effect of PM-JAY.

9.28 Figure 6 compares in West Bengal with its adjoining states (Bihar, Assam and Sikkim). Important differences emerge here. While infant and child mortality declined for all states, the decline has been sharper for states that implemented PM-JAY. While infant mortality rates declined by 20 per cent for West Bengal, the decline for the three neighbours was higher at 28 per cent. Similarly, while Bengal saw a fall of 20 per cent in its Under-5 mortality rate, the neighbours witnessed a 27 per cent reduction. The reduction in neo-natal mortality rates were similar for the four states: 30 per cent for West Bengal and a marginally higher 31 per cent for the three neighbours.

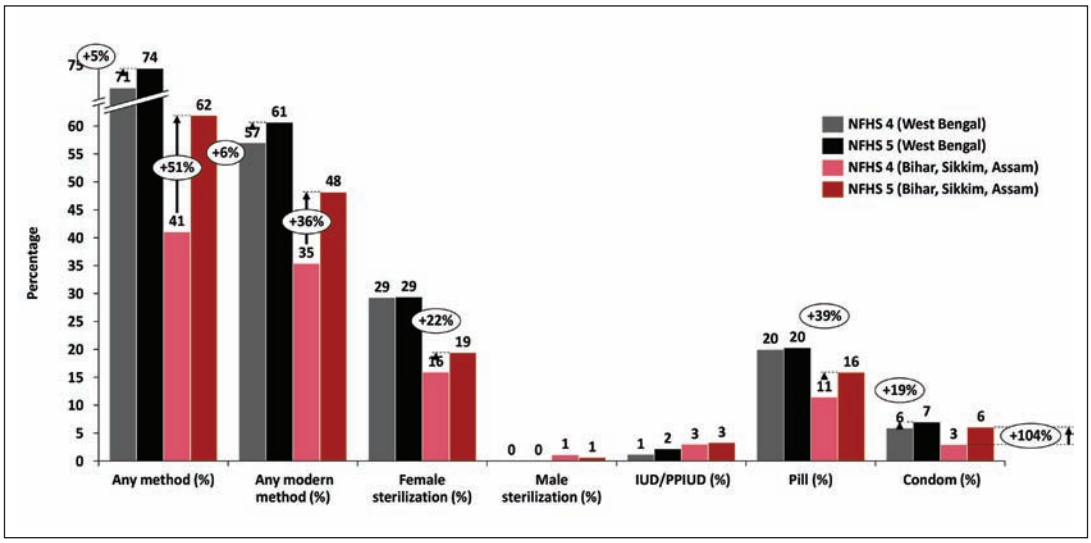
**Figure 6: Infant and Child Mortality Rates (per 1,000 live births): West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

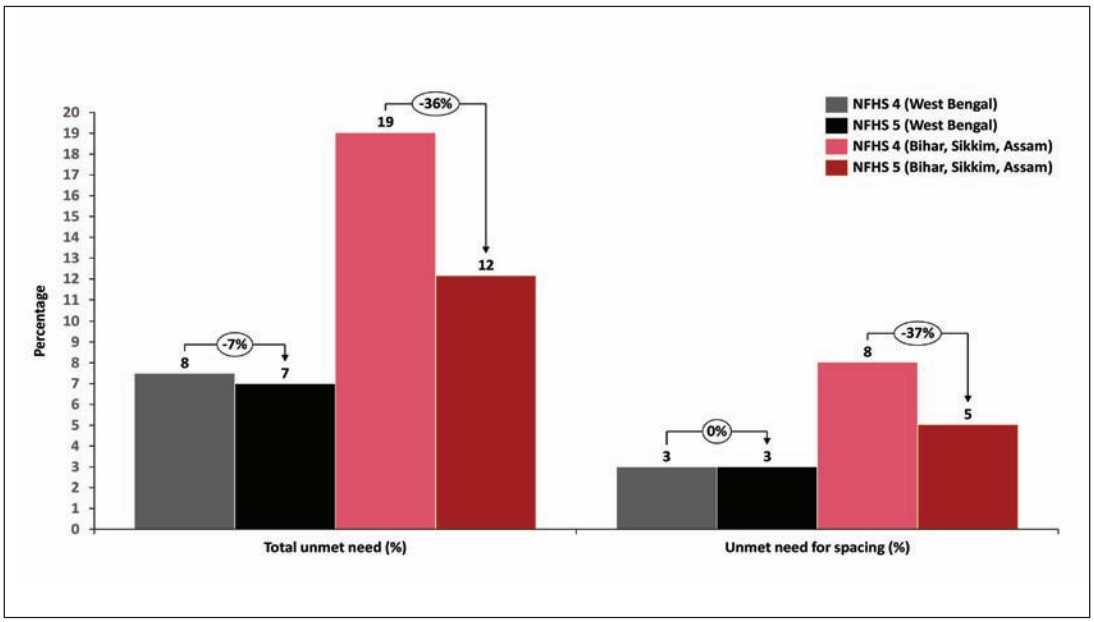
9.29 As seen in Figure 7, the use of at least one family planning method increased across all four states. However, similar to what we observed in the case of child mortality, the increase has been higher in states that have adopted PM-JAY. Modern methods of contraception went up by 36 per cent, female sterilization is up by 22 per cent, pill usage shot up by 28 per cent and condoms by 104 per cent in the 3 neighbouring states while the respective figures for West Bengal were 6 per cent, ~0 per cent, ~0 per cent and only 19 per cent.

**Figure 7: Current Use of Family Planning Methods (currently married women age 15–49 years): West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

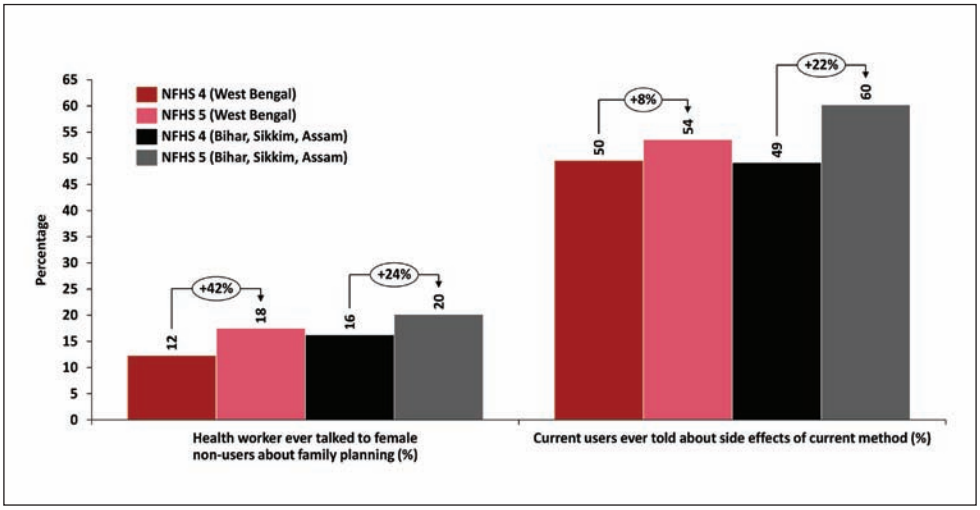
**Figure 8: Unmet Need for Family Planning (currently married women age 15–49 years): West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

9.30 The above findings are supported by the observations from Figure 8. The total unmet need for family planning methods shows a stark decline in states with PM-JAY when compared to West Bengal. While West Bengal did not witness any significant decline in unmet need for spacing between consecutive kids, the neighbouring three states in our analysis recorded a huge 37 per cent fall.

**Figure 9: Quality of family planning services: West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**

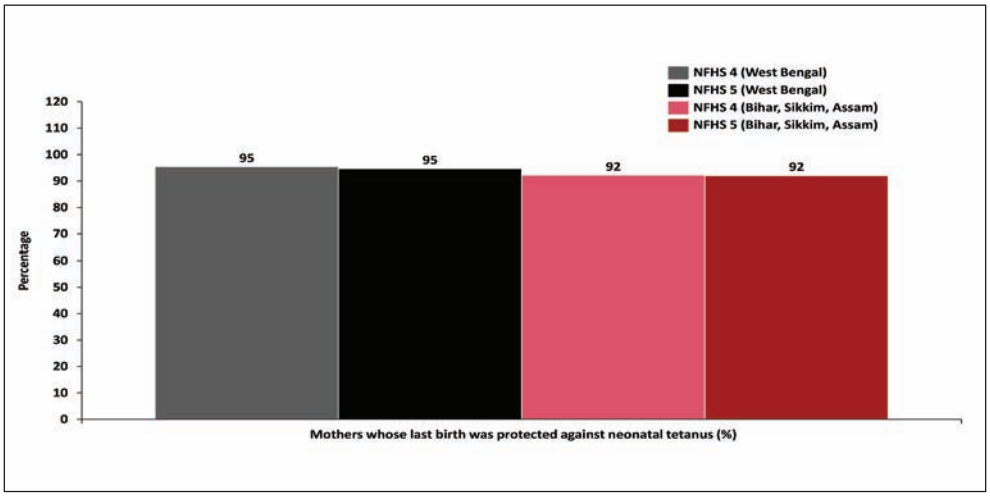



Source: National Family Health Survey (NFHS) 4 and 5

9.31 In tandem, the quality of family planning services has improved in all four states (Figure 9). Again, the impact has been felt more in states that implemented PM-JAY. The percentage who were informed by health care workers about family planning is higher in absolute terms in neighbouring states than in West Bengal though the improvement from a lower base was higher at 42 per cent in West Bengal than in the three states, where the improvement was 24 per cent. Also, the percentage of current users who were informed about side effects of the current method they were using is not only higher in neighbouring states in absolute terms post NHFS 5 but the increase of 22 per cent has been higher compared to what was observed in West Bengal of 8 per cent.

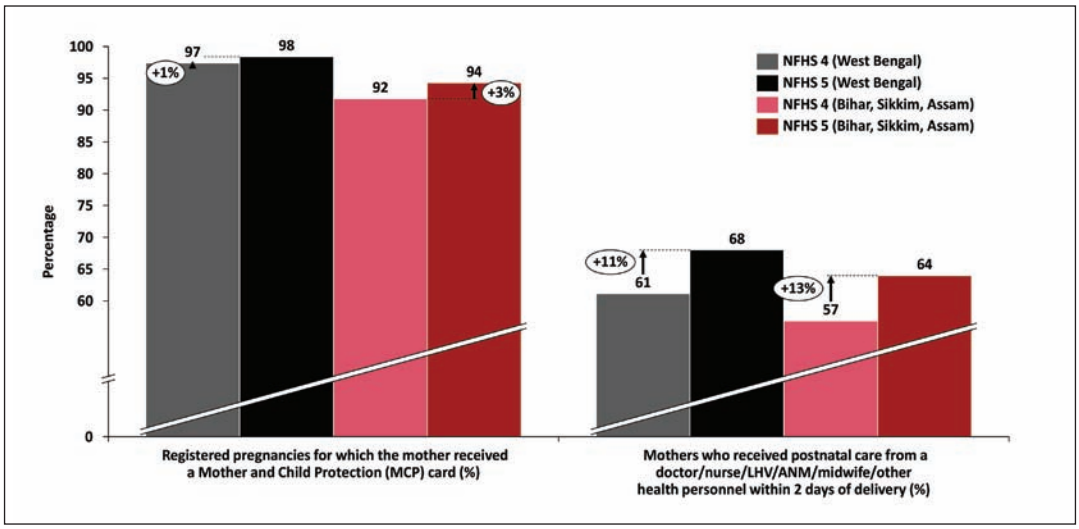
9.32 Next, we look at the difference in impacts on maternal and child health. Figure 10 shows no major improvements and differences in the four states. The high pecentage of women whose last birth was protected against neonatal tetanus in all four states is indicative of robust immunisation infrastructure.

**Figure 10: Maternal and Child Health: West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

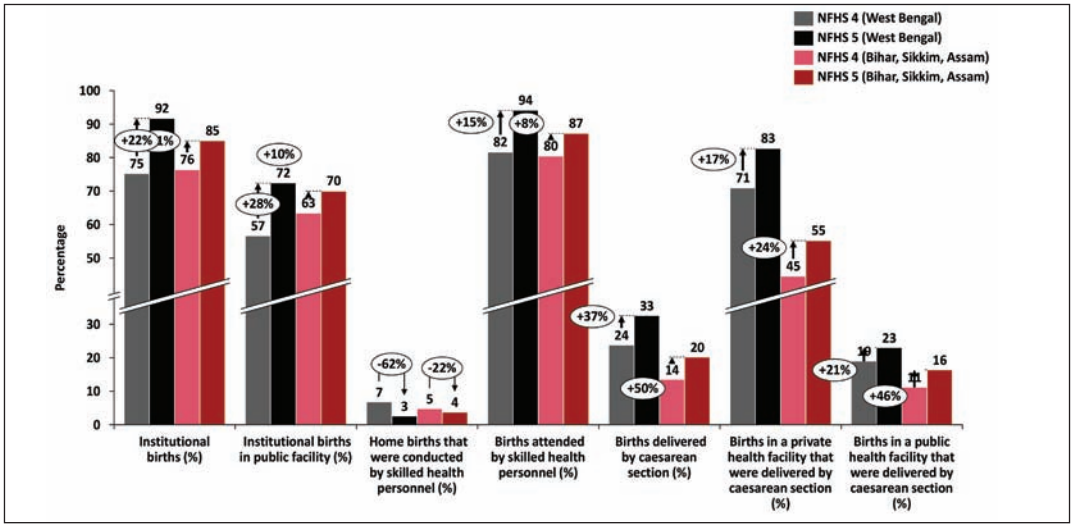
**Figure 11: Maternal and Child Health**




Source: National Family Health Survey (NFHS) 4 and 5

9.33 Figure 11 shows that the increase in registered pregnancies for which mother received a Mother Child Protection card was marginally higher in Bihar, Assam and Sikkim at 3 per cent when compared to West Bengal at 1 per cent. Similarly, we observe similar changes in the proportion of women who received postnatal care from health care personnel within two days of delivery in the four states. The three neighbouring states with PM-JAY witnessed slightly higher utilisation of maternal and child care services at 13 per cent when compared to West Bengal at 11 per cent.

**Figure 12: Delivery Care (for births in the 5 years before the survey): West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**



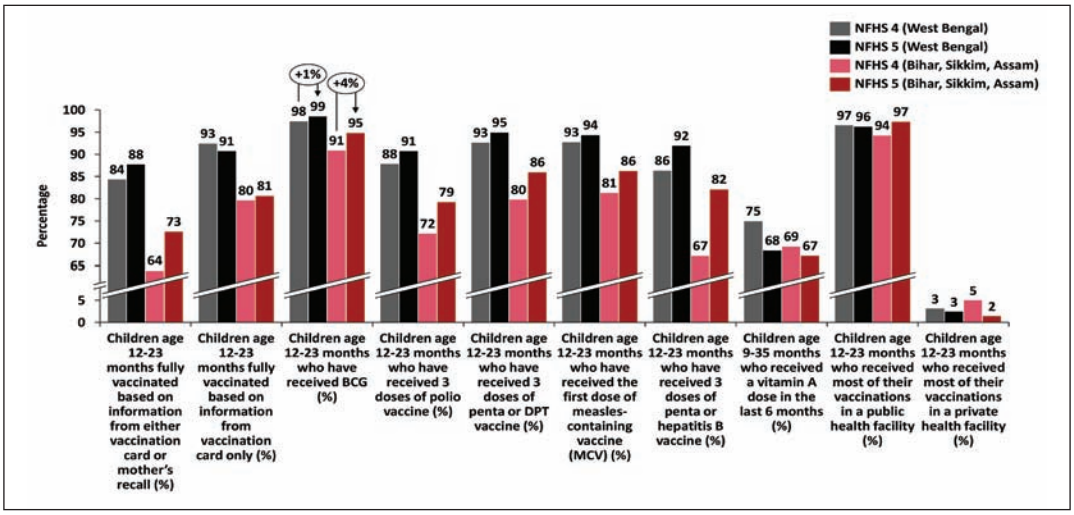

Source: National Family Health Survey (NFHS) 4 and 5

9.34 As per Figure 12, percentage of institutional births increased in all four states. However, the increase has been larger in West Bengal at 22 per cent when compared to the neighbouring states at 11 per cent. Percentage of births attended by a skilled personnel also increased more in West Bengal by 15 per cent and by 8 per cent in the three neighbouring states. While the

proportion of institutional births in a public facility went up by 28 per cent in West Bengal, the corresponding figure for the three states was 10 per cent. While share of births in a private health facility delivered via caesarean section went up for both private and public sector providers, the increase has been higher for public health facilities. This increase in public healthcare utilisation for births via caesarean section has also been higher in states with PM-JAY versus that in West Bengal. Bihar, Assam and Sikkim recorded a high 46 per cent jump from a lower base while this increase in West Bengal was 21 per cent but from a higher base. PM-JAY thus seems to have enabled citizens in these states to make greater use of the public healthcare infrastructure.

9.35 The adoption of PM-JAY in Bihar, Sikkim and Assam facilitated notable progress in health outcomes pertaining to child vaccinations and vitamin-A supplementation. Though improvement happened in all four states, the magnitude was greater in Bihar, Sikkim and Assam. For example, the proportion of children with age 12-23 months who have received BCG vaccine increased by 1 per cent in West Bengal as compared to 4 per cent increase in adjoining states; the proportion of children with age 12-23 months who have received three doses of penta or hepatitis B vaccine increased by 5 per cent in West Bengal in comparison to 19 per cent increase in the adjoining states. The only indicator which worsened was the proportion of children in the age group of 9-35 months who received a vitamin-A dose in the last six months, though the decline was sharper in West Bengal (-6 per cent) vis-à-vis the adjoining states (-2 per cent) (Figure 13).

**Figure 13: Child Vaccinations and Vitamin A Supplementation: West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**

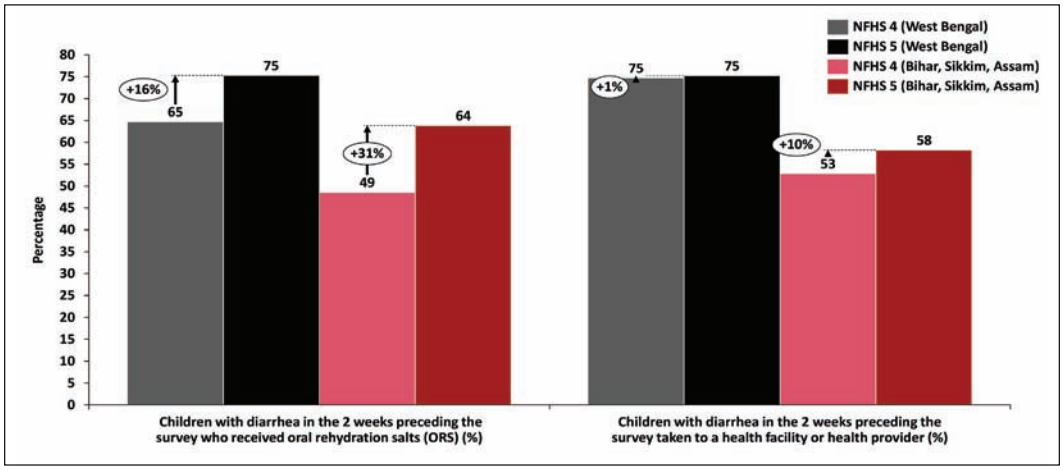



Source: National Family Health Survey (NFHS) 4 and 5

9.36 The data for the treatment of childhood diseases for children under the age of 5 years suggest improvement in all four states irrespective of the adoption of PM-JAY. However, the adjoining states (Bihar, Sikkim, Assam) registered greater improvements in comparison to West Bengal. While the proportion of children with diarrhea in the 2 weeks preceding the survey who received oral rehydration salts (ORS) increased by 16 per cent in West Bengal, it increased by 31 per cent in the adjoining states, an increase of almost double magnitude. Similarly, the proportion of children with diarrhea in the 2 weeks preceding the survey taken to a health

facility or health provider showed negligible improvement in West Bengal, with an increase of 10 per cent in the adjoining states (Figure 14).

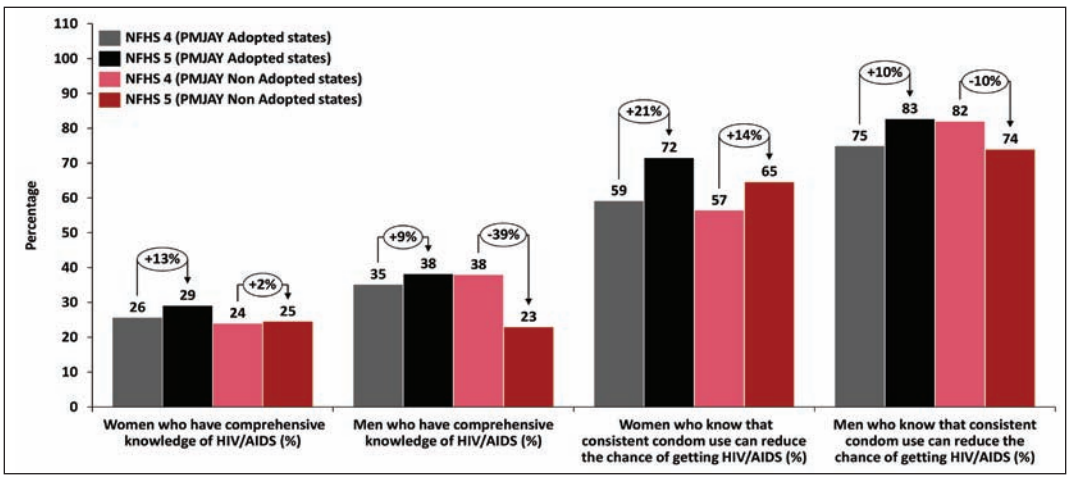
**Figure 14: Treatment of Childhood Diseases (children under age 5 years) : West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

9.37 Analysing the implications of the adoption of PM-JAY on the spread of knowledge and awareness about HIV/AIDS, we find that while the proportion of women who have comprehensive knowledge of HIV/AIDS increased significantly in the three states which adopted PM-JAY (Bihar, Sikkim, Assam), the proportion declined by 1 per cent in West Bengal, which did not adopt PM-JAY. The same indicator for men recorded a decline in all four states, though the decline was much sharper in West Bengal (-40 per cent) as compared to other three states (-19 per cent) (Bihar, Sikkim, Assam). The differences amongst the states are even sharper if we consider the proportion of men and women who know that consistent condom use can reduce the chance of getting HIV/AIDS. For example, in West Bengal the proportion of women increased moderately by 12 per cent as compared to the sharp increase of 43 per cent in the three adjoining states. The similar figures for men indicate a decline of 12 per cent in West Bengal in contrast to a rise of 18 per cent in Bihar, Sikkim and Assam (Figure 15).

**Figure 15: Knowledge of HIV/AIDS among Adults (age 15-49 years): West Bengal versus Adjoining States (Bihar, Sikkim, Assam)**




Source: National Family Health Survey (NFHS) 4 and 5

9.38 On comparing health outcomes in West Bengal, which did not adopt PM-JAY with outcomes in the three neighbouring states – Bihar, Sikkim and Assam – some important differences emerge. Although the four states are not very different in terms of their demographics and household characteristics, the difference in improvements of certain maternal and child related health outcomes has been higher in states with PM-JAY. This can be attributed to the impact of PM-JAY which was implemented in 2018. People with some health insurance jumped by 89 per cent from 2015-16 to 2019-20 in the neighbouring states while this proportion declined by 1 per cent in West Bengal in the same period. Infant mortality rate and under-5 mortality rates witnessed sharper declines in the neighbouring states that implemented PM-JAY than in West Bengal that did not implement it. Positive developments on the usage of family planning methods used were also higher for these states. Unmet needs of family planning services declined sharply in Bihar, Assam and Sikkim indicating effective delivery of primary care under PM-JAY.

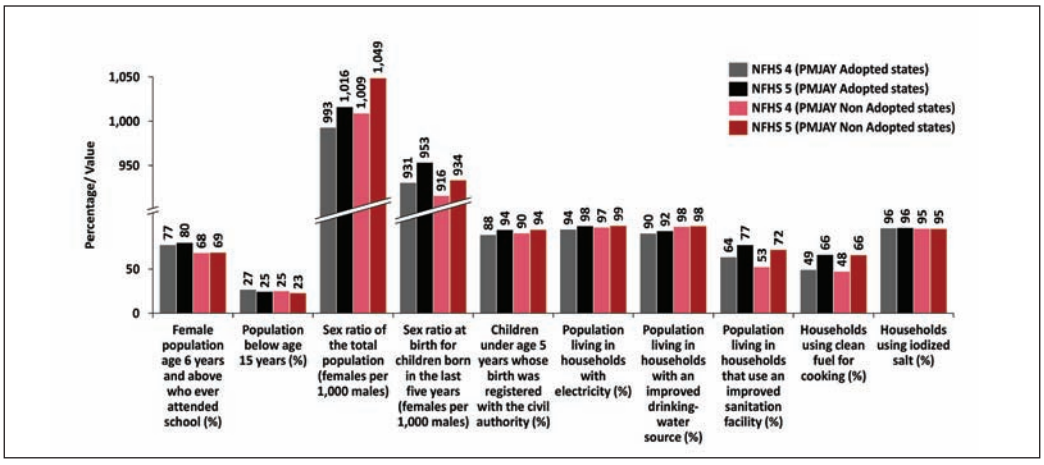
9.39 Differences were also observed in delivery of healthcare services. While the share of population who were made aware about family planning options and side effects increased in all four states, the improvements were higher for the three states under PM-JAY. Utilisation of public health care infrastructure for caesarean deliveries was also higher in these states indicating a higher section of population that now accessed these services. These three states also witnessed significantly higher improvements in child vaccination and vitamin supplementation, treatment of childhood diseases like diarrhoea, as well as awareness about HIV/AIDS especially among female adults. We thus infer than PM-JAY is likely to have led to greater health awareness, better delivery of healthcare services and improved maternal and child care outcomes.

## Comparing all States that adopted PM-JAY versus those that did not

9.40 Having examined the impact of the PM-JAY on the health outcomes across the geographically adjacent states in the last section we now undertake this comparison for all states by distinguishing between those states that implemented PM-JAY versus those that did not.

9.41 An analysis of the population and household profiles across NFHS 4 and NFHS 5 suggests that the improvement in the various characteristics were similar in the states that implemented PM-JAY vis-à-vis states that did not (Figure 16).

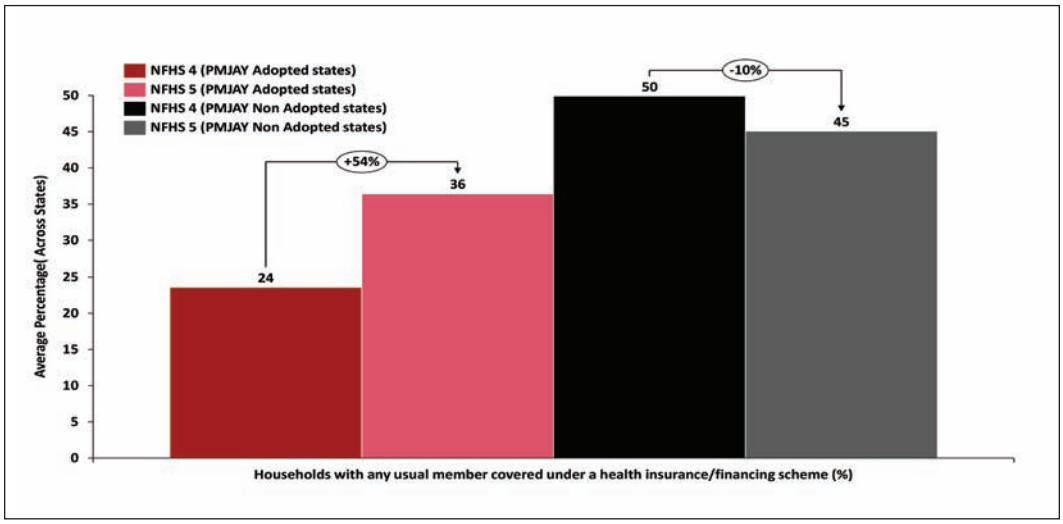
**Figure 16: Population and Household Profile: All States**




Source: National Family Health Survey (NFHS) 4 and 5

9.42 Crucially, while the proportion of households with any usual member covered under health insurance or financing scheme increased by 54 per cent from NFHS 4 to NFHS 5 in the states that adopted PM-JAY, it decreased by 10 per cent in the states that did not adopt PM-JAY, reflecting the success of PM-JAY in enhancing health insurance coverage (Figure 17).

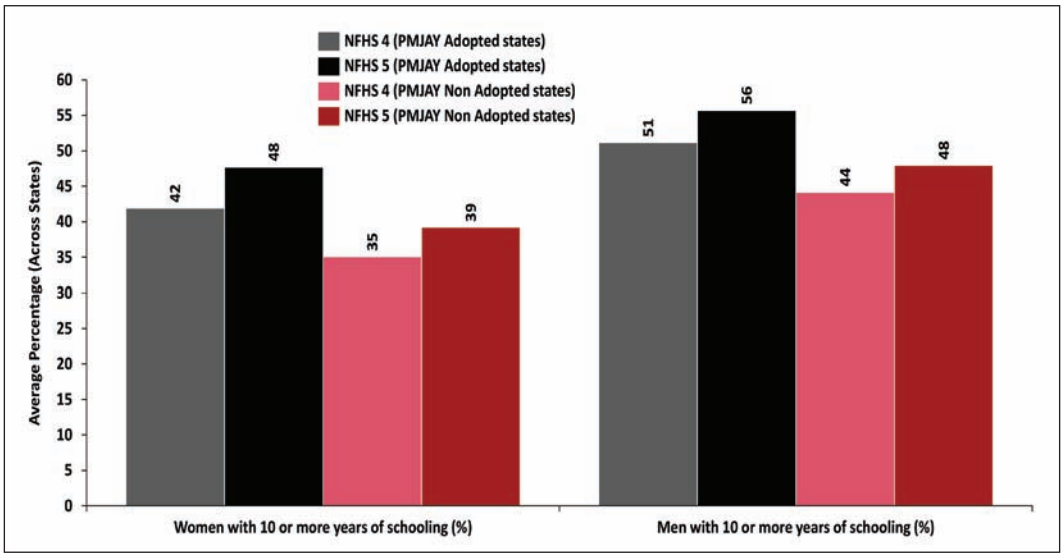
**Figure 17: Households with any usual member covered under a health insurance/financing scheme (per cent): All States**




Source: National Family Health Survey (NFHS) 4 and 5

9.43 Among the characteristics of adults, the average proportion of both women and men with 10 or more years of schooling improved similarly across the two groups of states (Figure 18).

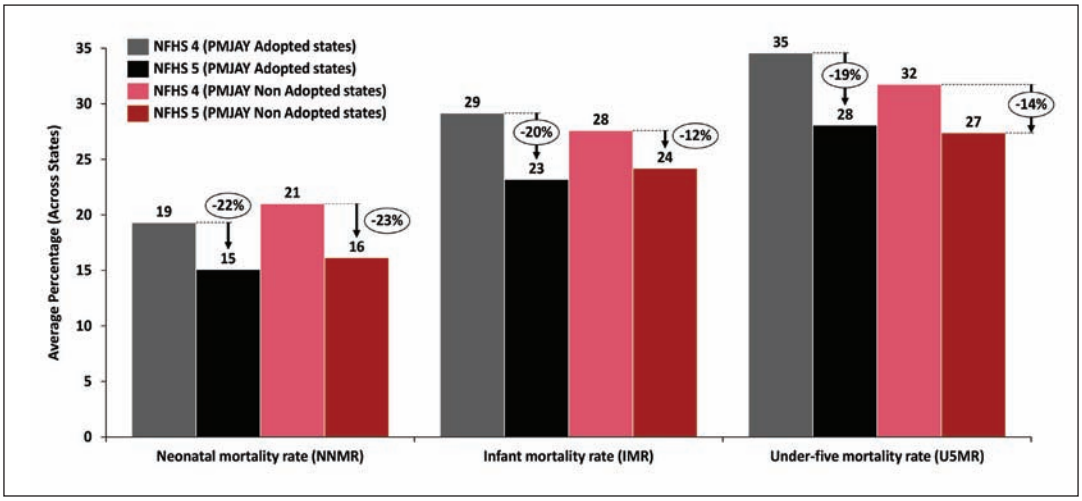
**Figure 18: Characteristics of Adults (age 15-49 years): All States**




Source: National Family Health Survey (NFHS) 4 and 5

9.44 PM-JAY has helped the Indian states in achieving reduced infant and child mortality rates (Figure 19). Neonatal mortality rate (NNMR) declined by 22 per cent in the states that adopted PM-JAY in comparison to a 16 per cent decline in states that did not adopt PM-JAY, an increment of 6 per cent for states that adopted PM-JAY versus those that did not. Similarly, the reduction in Infant mortality rate (IMR) was 20 per cent vis-à-vis 12 per cent in PM-JAY and non-PM-JAY states respectively, an increment of 8 per cent for states that adopted PM-JAY versus those that did not. While the Under-five mortality rate (U5MR) recorded a decline of 19 per cent in PM-JAY states, it reduced by 14 per cent in the non-PM-JAY states, an increment of 5 per cent for states that adopted PM-JAY versus those that did not.

**Figure 19: Infant and Child Mortality Rates (per 1,000 live births): All States**

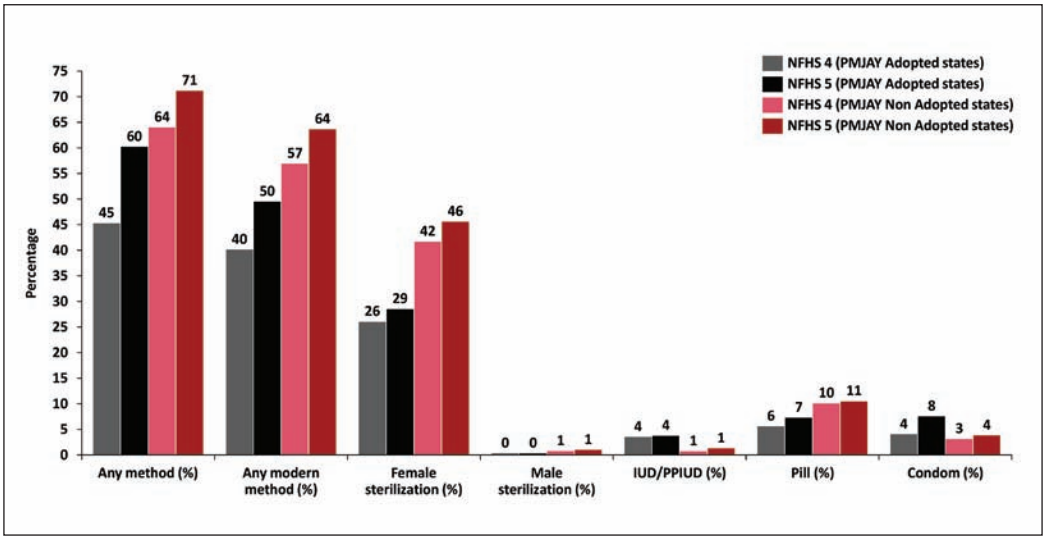



Source: National Family Health Survey (NFHS) 4 and 5

9.45 The data on the use of distinct family planning measures represents that PM-JAY has enabled an increased access to family planning in the Indian states. While the proportion of people ensuring family planning rose across all the states between the two surveys, the increase is much more significant in the states that adopted PM-JAY indicating its effectiveness. For example; the proportion of people currently using any method of family planning rose by 15 per cent in the PM-JAY adopted states and only by 7 per cent (less than half) in the other states (Figure 20).

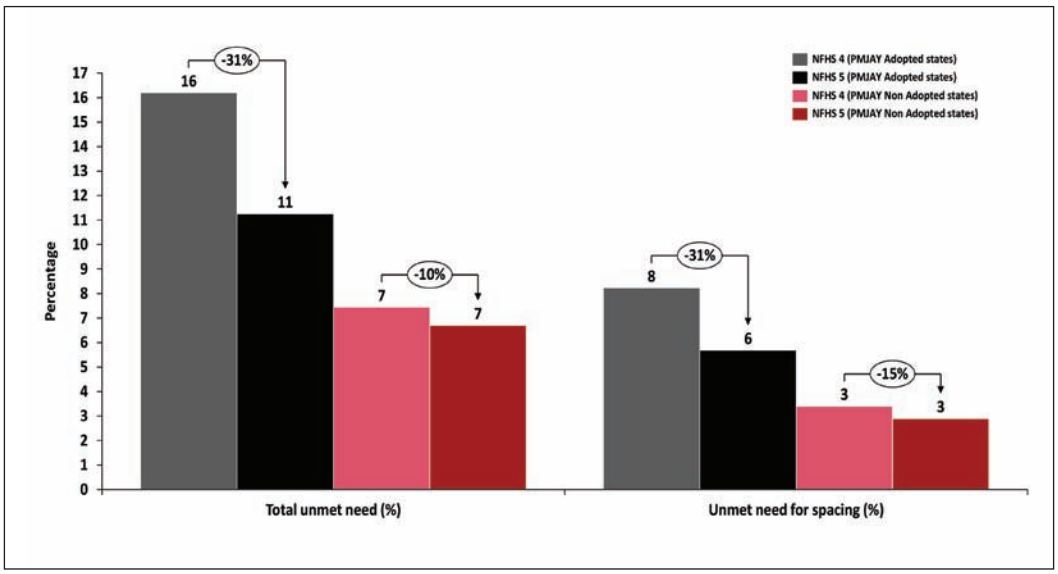
9.46 Further, the PM-JAY has warranted a notable reduction in the unmet need of family planning for the currently married women in the age group of 15-49 years. While the proportion of women with total unmet family planning needs i.e. the proportion of women who are fertile and desire to either terminate or postpone childbearing, but are not currently using any method of contraception decreased by 31 per cent in the PM-JAY states, the decline in the non-PM-JAY states was merely 10 per cent. Similarly, the proportion of women with unmet need for spacing i.e. women who wish to postpone their next birth by a specified length of time, reduced by 31 per cent in the PM-JAY states and by only 15 per cent in the non-PM-JAY states (Figure 21).

**Figure 20: Current Use of Family Planning Methods (currently married women age 15–49 years): All States**




Source: National Family Health Survey (NFHS) 4 and 5

**Figure 21: Unmet Need for Family Planning (currently married women age 15–49 years): All States**

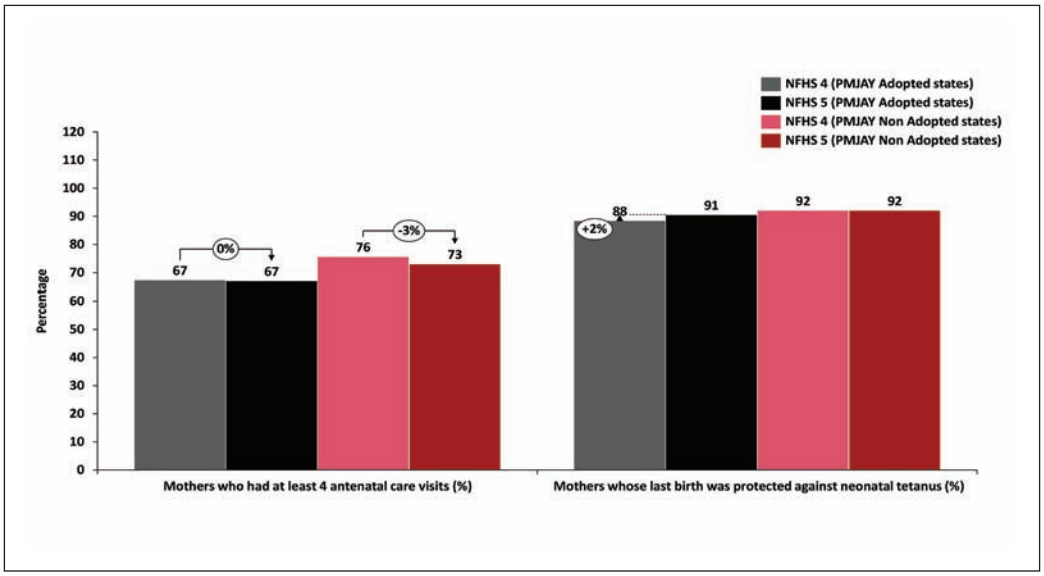



Source: National Family Health Survey (NFHS) 4 and 5

9.47 As far as the impact of the PM-JAY on maternal and child health is concerned, the benefits vary significantly across distinct indicators. While the proportion of mothers who had at least four antenatal care visits (per cent) remained constant between the NFHS surveys in the states which adopted PM-JAY, the proportion declined by 3 per cent among the non-PM-JAY states, suggesting non-effectiveness of the scheme. Also, the proportion of mothers whose last birth was protected against neonatal tetanus increased by two per cent in the PM-JAY states while remaining constant in the non-PM-JAY states between the two surveys (Figure 22a). On the contrary, the proportion of women with registered pregnancies for which they received a Mother and Child Protection (MCP) card registered an increase of 7 per cent in the PM-JAY states in comparison to 5 per cent

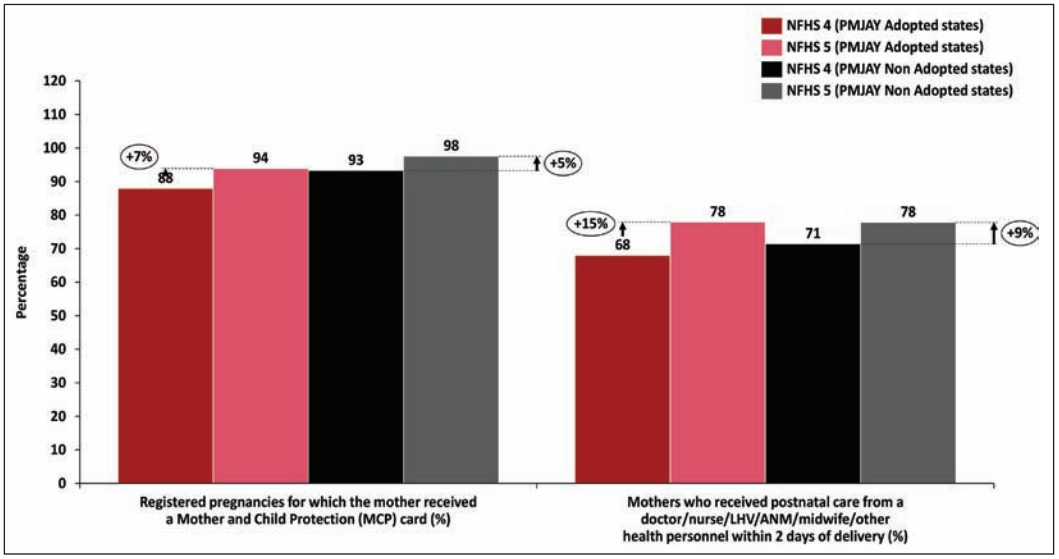
in the non-PM-JAY states. The percentage of mothers who received post-natal care within two days of delivery increased by 15 per cent in the PM-JAY states vis-à-vis an increase of only 9 per cent in the non-PM-JAY states, reflecting the positive impact of the PM-JAY on maternal health (Figure 22b).

**Figure 22a: Maternal and Child Health: All States**




Source: National Family Health Survey (NFHS) 4 and 5

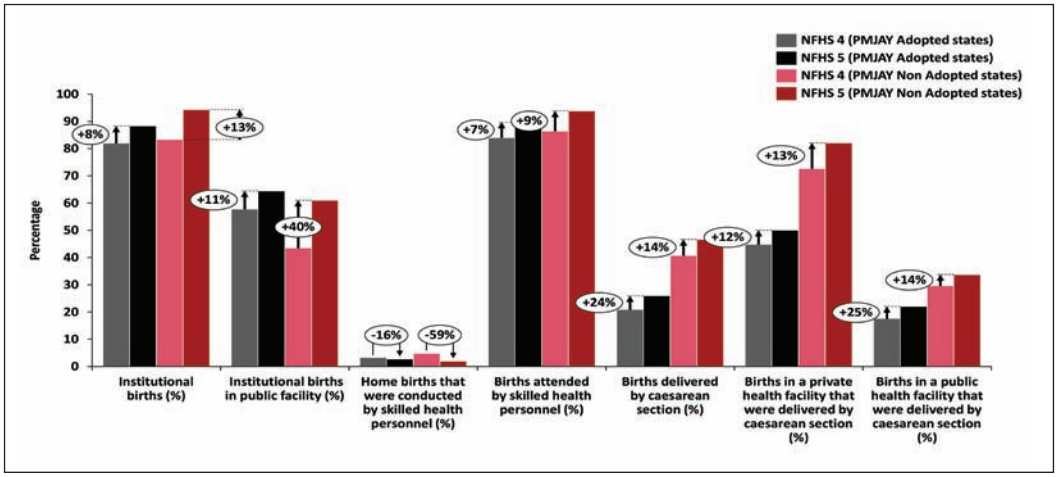
**Figure 22b: Maternal and Child Health: All States**




Source: National Family Health Survey (NFHS) 4 and 5

9.48 Considering the delivery care for births in the five years before the survey, we find that the PM-JAY has not been much fruitful. The improvement in the delivery care indicators, e.g. institutional births, institutional births in public facility, and home births are much higher in the states which did not adopt the PM-JAY. While there has been an overall increase in the caesarean deliveries, the percentage rise is higher among the PM-JAY states as compared to the non-PM-JAY states, barring caesarean deliveries in private health facilities (Figure 23).

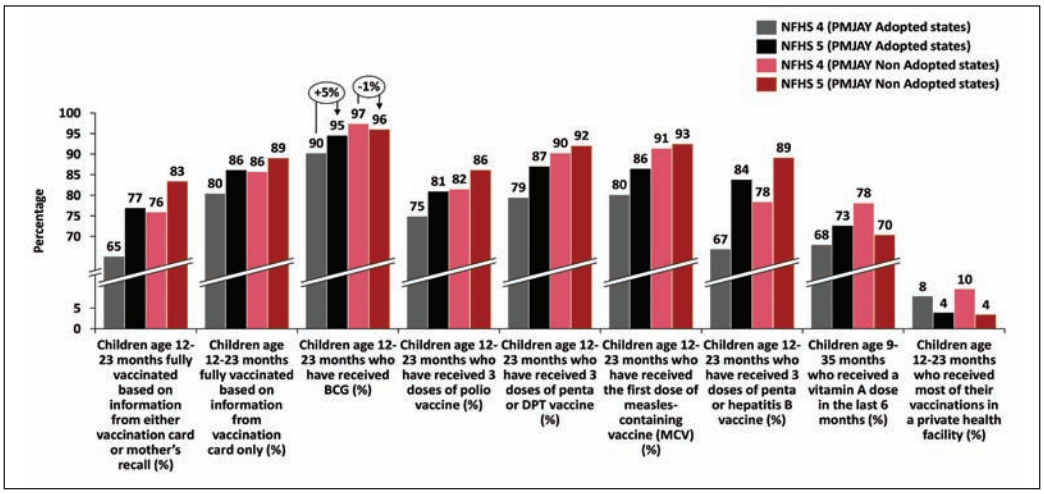
**Figure 23: Delivery Care (for births in the 5 years before the survey): All States**




Source: National Family Health Survey (NFHS) 4 and 5

9.49 Health outcomes pertaining to the vaccination of the child and vitamin-A supplementation improved remarkably in the states which adopted the PM-JAY as compared to the states which did not adopt the PM-JAY. For example: proportion of children in the age group of 12-23 months who have received BCG increased by 5 per cent in the PM-JAY states as compared to a decline of 1 per cent in the non-PM-JAY states. Similarly, proportion of children belonging to the age group of 9-35 months who received a vitamin A dose in the last six months increased by 5 per cent in the PM-JAY states in comparison to a reduction of 8 per cent in the non-PM-JAY states (Figure 24).

**Figure 24: Child Vaccinations and Vitamin-A Supplementation: All States**

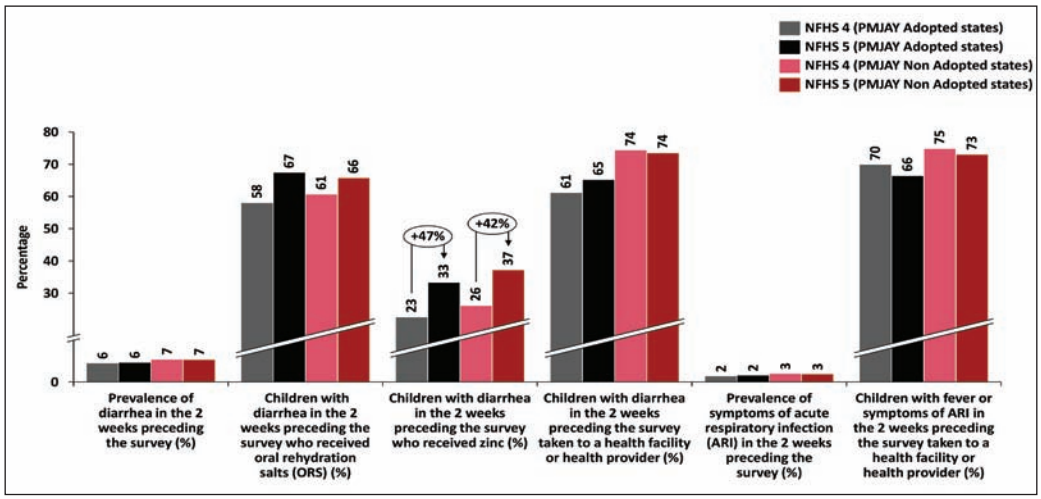



Source: National Family Health Survey (NFHS) 4 and 5

9.50 Even though minor, the PM-JAY also allowed for an improved treatment of the childhood diseases among the children under the age of 5 years. The proportion of children with diarrhea in the two weeks preceding the survey who received oral rehydration salts (ORS) increased by 9 per cent between the surveys in the PM-JAY states as compared to a 5 per cent increase in the non-PM-JAY states. The proportion of children in the same category which received zinc increased by 47 per cent and 42 per cent respectively. While the proportion of children taken to

health facility or health provider for improved (4 per cent) in case of diarrhea in the PM-JAY states, it remained constant in the non-PM-JAY states. However, the same indicator for illness like fever or ARI symptoms recorded a decline of 4 per cent in the PM-JAY states as compared to a fall of 2 per cent in the non-PM-JAY states (Figure 25).

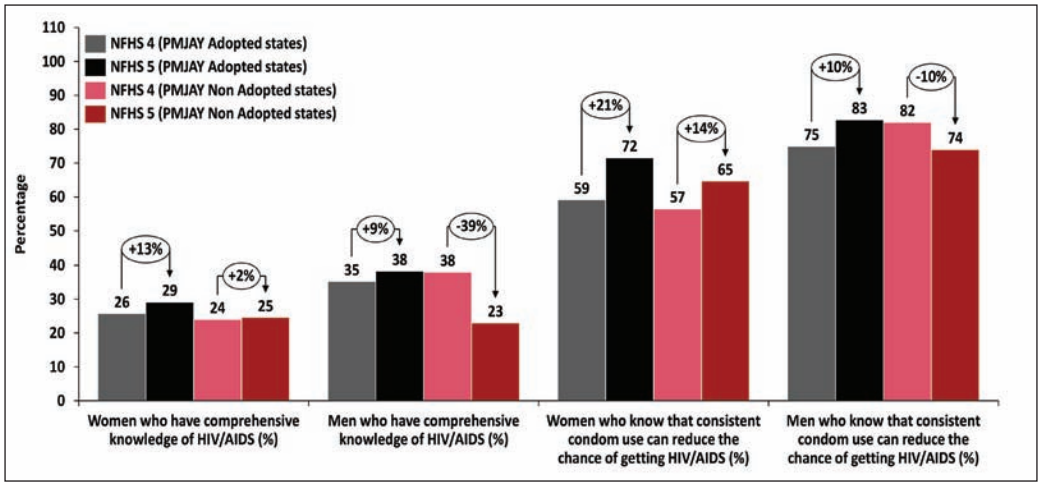
**Figure 25: Treatment of Childhood Diseases (children under age 5 years): All States**




Source: National Family Health Survey (NFHS) 4 and 5

9.51 PM-JAY has not only been successful in improving health outcomes across states, but has also accounted for the increase in the spread of knowledge and awareness regarding important health concerns like HIV/AIDS. The percentage of women who have comprehensive knowledge of HIV/AIDS (per cent) increased remarkably by 13 per cent in the PM-JAY states, vis-à-vis an increase of mere 2 per cent in the non-PM-JAY states. The difference in respective figures for men is even starker, at 9 per cent increase in the PM-JAY states and a decrease of 39 per cent in the non-PM-JAY states. Likewise, the percentage of women who know that consistent condom use can reduce the chance of getting HIV/AIDS increased by 21 per cent in the PM-JAY states as compared to 14 per cent in the no-PM-JAY states. The same indicator for men suggests an increase of 10 per cent in the PM-JAY states as opposed to a sharp decline of 10 per cent in the non-PM-JAY states (Figure 26).

**Figure 26: Knowledge of HIV/AIDS among Adults (age 15-49 years): All States**




Source: National Family Health Survey (NFHS) 4 and 5

## CONCLUDING OBSERVATIONS

9.52 The health outcomes of the states that adopted PM-JAY improved when compared to the states that did not adopt it. Using difference-in-difference computations that control for confounding factors, this chapter shows that states adopting PM-JAY are able to improve their health outcomes. Relative to states that did not implement PM-JAY, states that adopted it experienced greater penetration of health insurance, experienced a reduction in infant and child mortality rates, realized improved access and utilization of family planning services, and greater awareness about HIV/AIDS. While some of these effects stemmed directly from enhanced care enabled by insurance coverage, others represent spillover effects due to the same. Even though only a short time has elapsed since its introduction, the effects that are identified by the Survey underscores the potential of the program to significantly alter the health landscape in the country, especially for the vulnerable sections.

### CHAPTER AT A GLANCE

- This chapter demonstrates strong positive effects on healthcare outcomes of the Pradhan Mantri Jan Arogya Yojana (PM-JAY) – the ambitious program launched by Government of India in 2018 to provide healthcare access to the most vulnerable sections. This is despite the short time since the introduction of the program.
- PM-JAY is being used significantly for high frequency, low cost care such as dialysis and continued to be utilised without disruption even during the Covid pandemic and the lockdown. General medicine – the overwhelmingly major clinical specialty accounting for over half the claims - exhibited a V-shaped recovery after falling during the lockdown and reached pre-COVID-19 levels in December 2020.
- The final – but the most crucial – analysis in the chapter attempts to estimate the impact of PM-JAY on health outcomes by undertaking a difference-in-difference analysis. As PM-JAY was implemented in 2018, health indicators measured by National Family Health Surveys 4 (in 2015-16) and 5 (in 2019-20) provide before-after data to assess this impact. To mitigate the impact of various confounding factors that may be contemporaneously correlated with the adoption of PM-JAY, we compute a difference-in-difference by comparing states that implemented PM-JAY versus those that did not. We undertake this analysis in two parts. First, we use West Bengal as the state that did not implement PM-JAY and compare its neighbouring states that implemented PM-JAY – Bihar, Sikkim and Assam. Second, we repeat the same analysis for all states that did not implement PM-JAY vis-à-vis all states that did.

- PM-JAY enhanced health insurance coverage. The proportion of households that had health insurance increased in Bihar, Assam and Sikkim from 2015-16 to 2019-20 by 89 per cent while it decreased by 12 per cent over the same period in West Bengal. Across all the states, the proportion of households with health insurance increased by 54 per cent for the states that implemented PM-JAY while falling by 10 per cent in states that did not.

- From 2015-16 to 2019-20, infant mortality rates declined by 12 per cent for states that did not adopt PM-JAY and by 20 per cent for the states that adopted it. Similarly, while states that did not adopt PM-JAY saw a fall of 14 per cent in its Under-5 mortality rate, the states that adopted it witnessed a 19 per cent reduction. While states that did not adopt PM-JAY witness 15 per cent decline in unmet need for spacing between consecutive kids, the states that adopted it recorded a 31 per cent fall. Various metrics for mother and child care improved more in the states that adopted PM-JAY as compared to those who did not. Each of these health effects manifested similarly when we compare Bihar, Assam and Sikkim that implemented PM-JAY versus West Bengal that did not. While some of these effects stemmed directly from enhanced care enabled by insurance coverage, others represent spillover effects due to the same. Overall, the comparison reflects significant improvements in several health outcomes in states that implemented PM-JAY versus those that did not. As the difference-in-difference analysis controls for confounding factors, the Survey infers that PM-JAY has a positive impact on health outcomes.

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# The Bare Necessities

**10**
**CHAPTER**

**Look for the bare necessities,**
**The simple bare necessities,**
**Forget about your worries and your strife,**
**I mean the bare necessities!**

**—The Jungle Book**

*Access to "the bare necessities" such as housing, water, sanitation, electricity and clean cooking fuel are a sine qua non to live a decent life. This chapter examines the progress made in providing access to "the bare necessities" by constructing a Bare Necessities Index (BNI) at the rural, urban and all India level. The BNI summarises 26 indicators on five dimensions viz., water, sanitation, housing, micro-environment, and other facilities. The BNI has been created for all states for 2012 and 2018 using data from two NSO rounds viz., 69$^{th}$ and 76$^{th}$ on Drinking Water, Sanitation, Hygiene and Housing Condition in India.*

*Compared to 2012, access to "the bare necessities" has improved across all States in the country in 2018. Access to bare necessities is the highest in the States such as Kerala, Punjab, Haryana and Gujarat while it is the lowest in Odisha, Jharkhand, West Bengal and Tripura. The improvements are widespread as they span each of the five dimensions viz., access to water, housing, sanitation, micro-environment and other facilities. Inter-State disparities in the access to "the bare necessities" have declined in 2018 when compared to 2012 across rural and urban areas. This is because the States where the level of access to "the bare necessities" was low in 2012 have gained relatively more between 2012 and 2018. Access to "the bare necessities" has improved disproportionately more for the poorest households when compared to the richest households across rural and urban areas. The improvement in equity is particularly noteworthy because while the rich can seek private alternatives, lobby for better services, or if need be, move to areas where public goods are better provided for, the poor rarely have such choices.*

*Using data from the National Family Health Surveys, we correlate the BNI in 2012 and 2018 with infant mortality rate and under-5 mortality rate in 2015-16 and 2019-20 respectively and find that the improved access to "the bare necessities" has led to improvements in health indicators. Similarly, we also find that improved access to "the bare necessities" correlates with future improvements in education indicators.*

## INTRODUCTION

10.1 Since the 1950s, when Shri. Pitambar Pant advocated the idea of "minimum needs", the idea that economic development can be viewed as a process of providing the "bare necessities of life" to citizens has been around in India. A family's ability to access bare necessities – such as housing, water, sanitation, electricity and clean cooking fuel – have therefore been regarded as an important barometer of economic development in academic and policymaking circles. This idea of accessing the bare necessities of life as a *sine qua* non has resonated with the common man as well. No wonder Bollywood's rhetoric, which often mirrors socio-economic issues in the country (Desai, 2004), has zoomed in on "the bare necessities" in movies such as *Roti, Kapda Aur Makaan* (1974). A pointed question by the angry young man Shri. Amitabh Bachchan in the 1989 movie *Main Azaad Hoon* "चालीस बरस में, आप एक इंसान के लिए एक गिलास पानी नहीं दे सकते, तो आप क्या कर सकते हैं?" highlights the importance of "the bare necessities" to the common man. The song "the bare necessities" in Rudyard Kipling's *The Jungle Book* captures their importance too. The Sustainable Development Goals (SDGs) focus on providing "the bare necessities" to all: Goal 6 focuses on access to clean water and sanitation to all while, goal 7 *inter alia* aims to provide universal access to electricity and clean cooking fuel. The Economic Survey 2019-20 examined access to food through the idea of "Thalinomics: The Economics of a Plate of Food in India." In this chapter, the Economic Survey builds on that endeavour by examining the progress made in the country on providing "the bare necessities" to all its citizens.

10.2 The "bare necessities" of housing, water, sanitation, electricity and clean cooking fuel are jointly consumed by all the members of a household. They, therefore, touch the life of every member in the household. As these are durable assets, they deliver services to the household over long periods of time. Access to clean drinking water, safe sanitation and clean cooking fuel also have direct linkages with health of the members in the household. Access to these saves time for a household, which they can utilise in productive activities such as education and learning.

10.3 In order to improve access to "the bare necessities," successive governments have made constant efforts. The network of schemes designed to deliver these necessities include *inter-alia* the Swachh Bharat Mission (SBM), National Rural Drinking Water Programme (NRDWP), Pradhan Mantri Awaas Yojana (PMAY), Saubhagya, and Ujjwala Yojana (Box-1). These Schemes were equipped with new features such as use of technology, real time monitoring, geo-tagging of assets, social audit, embedded digital flow of information, and direct benefit transfers wherever possible. As Chapter 10 in the Economic Survey 2018-19 highlights, these features improved the transparency in governance and enhanced the efficiency and effectiveness of the Schemes.

**Box 1: Government Schemes for Bare Necessities**

| Scheme | Objective | Targets and achievements |
|---|---|---|
| Swachh Bharat Mission-Rural and Urban | Objective of SBM-Rural was to attain Open Defecation Free (ODF) India by 2nd October, 2019 by providing access to toilet facilities to all rural households in the country.<br>Objective of SBM-Uuban is to achieve 100 per cent Open Defecation Free (ODF) status and 100 per cent scientific processing of the Municipal Solid Waste (MSW) being generated in the country. | Under SBM, rural sanitation coverage has made an incredible leap in the target achievement with more than 10 crore toilets built across rural India. With a view to sustain the gains made under the programme in the last five years and to ensure that no one is left behind and to achieve the overall cleanliness in villages, phase II of SBM(G) from 2020-21 to 2024-25 is being implemented focusing on ODF sustainability and Solid & Liquid Waste Management (SLWM) through convergence between different verticals of financing and various Schemes of Central and State Governments such as 15th Finance Commission grants to local bodies, MNREGS, Corporate Social Responsibility (CSR) funds etc.<br>Since its launch in 2014, SBM-U has made significant progress in the area of both sanitation and solid waste management. 4,327 Urban Local Bodies (ULBs) have been declared ODF so far. This has been made possible through construction of more than 66 lakhs individual household toilets and over 6 lakhs community/ public toilets, far exceeding the Mission's targets. The Mission is now focusing on holistic sanitation through its ODF+ and ODF++ protocols with a total of 1,319 cities certified ODF+ and 489 cities certified ODF++ as on date. In the area of solid waste management, 100 per cent of wards have complete door-to door collection. Further, out of 1,40,588 Tonnes Per Day (TPD) waste generated per day, 68 per cent (i.e., 95,676 TPD) is being processed. |

| | | |
|---|---|---|
| Pradhan Mantri Awaas Yojana (PMAY) | PMAY intends to provide housing for all in urban and rural areas by 2022. | Under PMAY (Urban), as on 18th January, 2021, 109.2 lakh houses have been sanctioned out of which 70.4 lakh houses have been grounded for construction of which 41.3 lakh have been built to the beneficiaries under PMAY(U) since inception of the scheme in June, 2015.<br>The target number of houses for construction under PMAY (Gramin) is 2.95 crore in two phases i.e. 1.00 crore in Phase I (2016-17 to 2018-19) and 1.95 crore in Phase II (2019-20 to 2021-22). Since 2014-15, construction of approx. 1.94 crore rural houses have been completed, out of which 1.22 crore houses have been constructed under the revamped scheme of PMAY-G and 0.72 crore under erstwhile Indira Awaas Yojana scheme. |
| NRDWP, now Jal Jeevan Mission (JJM) | The objectives of the NRDWP was to provide safe and adequate water for drinking, cooking and other domestic needs to every rural person on a sustainable basis. Goal of JJM is to provide functional tap water connection (FTWC) every rural household by 2024 and get assured supply of potable piped water at a service level of 55 litres per capita per day (lpcd) regularly on long-term basis by ensuring functionality of the tap water connections | At the time of roll out of the scheme in August 2019, about 3.23 crore (17 per cent) households out of total 18.93 crore rural households had tap water supply. Remaining 15.70 crore (83 per cent) rural households were to be provided with functional tap water connections by 2024. Upto 16th January, 2021, so far about 3.2 crore of rural households have been provided with FTWC since the launch of the Mission. Keeping with 'no one is left out' principle, 18 districts in the country spread across Gujarat (5), Telangana (5), Himachal Pradesh (1), Jammu & Kashmir (2), Goa (2) and Punjab (3) have become 'Har Ghar Jal districts'whereas 57,935 villages have also become 'Har Ghar Jal Gaon'. |
| Sahaj Bijli Har Ghar Yojana – Saubhagya | Government launched Saubhagya Yojana in October, 2017 with the objective to achieve universal household electrification by providing electricity connections to all willing un-electrified households in rural areas and all willing poor households in urban areas in the country, by March, 2019. | All States have declared electrification of all households on Saubhagya portal, except 18,734 households in Left Wing Extremists (LWE) affected areas of Chhattisgarh as on 31.03.2019. Electricity connections to 262.84 lakh households have been released from 11.10.2017 to 31.03.2019. Subsequently, seven States reported that 19.09 lakh un-electrified households identified before 31.03.2019, which were earlier un-willing but have expressed willingness to get electricity connection. States have been asked to electrify these households under Saubhagya. |

| | | |
|---|---|---|
| | | These households are being electrified by the concerned States and as on 20.12.2019, electricity connections to 7.42 lakh Households have been released. |
| Pradhan Mantri Ujjwala Yojana (PMUY) | PMUY launched in May, 2016 in order to provide clean cooking fuel to poor households with a target to provide 8 crore deposit free LPG connection. This connection is provided in the name of an adult woman member of a poor family and the beneficiary has an option to avail connection with 14.2 kg or 5 kg cylinder. The existing beneficiary with 14.2 kg LPG cylinder has an option to swap with 5 kg cylinder also. | Under PMUY, a target to provide 8 crore new LPG connections has been achieved in September, 2019, 7 months in advance of the target date of 31st March, 2020. |

Source: Complied based on information received from concerned Ministries/Departments

10.4 To measure the progress in the delivery of "the bare necessities", the Survey develops a composite index called the Bare Necessities Index (BNI); see Box 2 for the details about the construction of the index. The BNI measures access to "the bare necessities" for households in rural areas, urban areas and at the all India level. These necessities are measured using 26 comparable indicators on five dimensions *viz*., water, sanitation, housing, micro-environment, and other facilities. The indicators used to capture the availability and quality of housing, access to bathroom, kitchen, toilet, drinking water, waste discharge facilities, clean cooking fuel and disease free environment, *etc*. The composite index for the States/UTs for 2012 and 2018 has been created using data mainly from two NSO rounds viz., 69th (2012) and 76th (2018), on Drinking Water, Sanitation, Hygiene, and Housing Condition in India.

## Box 2: The Bare Necessities Index

The "basic needs" approach to economic development focuses on the minimum specified quantities of basic necessities such as food, clothing, shelter, water and sanitation that are necessary to prevent ill health, and undernourishment (Streeten, 1981; Emmerij, 2010). Sen (1999) defines poverty as a failure to achieve certain minimum basic needs or capacities. Shaffer (2008) similarly defines poverty as the deprivation of material requirements for the minimum acceptable fulfilment of basic needs. The Bare Necessities Index (BNI) is an attempt to quantify this approach to economic development using data from the National Statistical Office (NSO).

The data for developing the Bare Necessities Index (BNI) is sourced from two NSO Rounds on drinking water, sanitation, hygiene, and housing condition in India: 69th (2012) and 76th (2018). The data on the indicator 'household using LPG for cooking' for 2011-12 is taken from NSO Report on Energy Sources of Indian Households for Cooking and Lighting 2011-12. The BNI is created for all

States/UTs by employing the data at State level. As Telangana did not exist in 2011, data is not available for the State in 2011; however, the maps show the index value for the combined State of Andhra Pradesh in 2011. The indicators selected are the most desirable options and relevant for public policy targets from the possible and recorded options. The index is constructed at two points of time – 2012 and 2018 – using 26 indicators on five dimensions viz., water, sanitation, housing, micro-environment, and other facilities (Table 1).

**Table 1: Details of Indicators (all in per cent of Households) Used under Five Dimensions given in the NSO report.**

| **Five Dimensions** | Indicators used for the analysis are in **Bold *italics,* ***Figures in parenthesis indicate the number of indicators taken in each of the dimensions. |
|---|---|
| I. Water (6*) | • Principal source of drinking water: ***piped water into dwelling, piped water to yard/plot*** ; all options are :(bottled water - 01, piped water into dwelling - 02, piped water to yard/plot - 03, piped water from neighbour - 04, public tap/standpipe - 05, tube well - 06, hand pump - 07, well: protected - 08, unprotected - 09; tanker-truck: public - 10, private - 11; spring: protected - 12, unprotected - 13; rainwater collection -14, surface water: tank/pond - 15, other surface water (river, dam, stream, canal, lake, etc.) - 16; others (cart with small tank or drum, etc) - 19)<br>• Distance to the principal source of drinking water: ***within dwelling, outside dwelling but within premises*** (within dwelling - 1, outside dwelling but within the premises -2, outside premises: less than 0.2 k.m. -3, 0.2 to 0.5 k.m. - 4, 0.5 to 1.0 k.m. - 5, 1.0 to 1.5 k.m. - 6, 1.5 k.m. or more - 7)<br>• Method of taking water: ***through tap*** (through tap - 1, vessel with handle dipped in to take out water - 2, vessel without handle dipped in to take out water - 3, poured out - 4)<br>• Nature of access: ***exclusive use of the household*** (exclusive use of household - 1, common use of households in the building - 2, neighbour's source - 3, community use: public source restricted to particular community - 4, public source unrestricted - 5, private source restricted to particular community - 6, private source unrestricted - 7; others - 9). |
| II. Sanitation (5*) | • Access of the household to latrine: ***exclusive use of the household*** (exclusive use of household - 1, common use of households in the building - 2, public/community latrine without payment - 3, public/community latrine with payment - 4, others - 9, no latrine - 5).<br>• Type of latrine used by the household: ***piped sewer system, septic tank, twin leach pit, single pit*** (used: flush/pour-flush to: piped sewer system - 01, septic tank - 02, twin leach pit - 03, single pit - 04, elsewhere (open drain, open pit, open field, etc) - 05; ventilated improved pit latrine - 06, pit latrine with slab - 07, pit latrine without slab/open pit - 08, composting latrine - 10, others - 19; not used - 11) |

| | |
|---|---|
| III. Housing (3*) | • Condition of structure: ***Good*** (good - 1, satisfactory - 2, bad - 3).<br>• Type of the dwelling: ***Independent*** (independent house - 1, flat - 2, others - 9)<br>• Pucca dwelling: if ***having pucca[1] wall and roof*** [wall type (grass/ straw/ leaves/ reeds/ bamboo, etc. - 1, mud (with / without bamboo) / unburnt brick - 2, canvas / cloth - 3, other katcha - 4, timber - 5, burnt brick / stone/ lime stone - 6, iron or other metal sheet - 7, cement / RBC / RCC - 8, other pucca - 9); roof type (grass/ straw/ leaves/ reeds/ bamboo etc. - 1, mud / unburnt brick - 2, canvas / cloth - 3, other katcha - 4, tiles / slate - 5, burnt brick / stone / lime stone - 6, iron / zinc /other metal sheet /asbestos sheet - 7, cement / RBC / RCC - 8, other pucca - 9)] |
| IV. Micro-environment (4*) | • Drainage system of the household: ***No drainage, open katcha drainage*** (underground -1, covered pucca -2, open pucca -3, open katcha -4, no drainage -5)<br>• Whether the household faced problem of flies/mosquitoes during last 365 days? : ***Severe*** (yes: severe - 1, moderate - 2; no - 3).<br>• Whether any effort was made by the Local Bodies/State Government during last 365 days to tackle problem of flies/mosquitoes? : ***Yes*** (yes - 1, no - 2, not known - 3). |
| V. Other Facilities (8*) | • Kitchen type: ***with water tap, no separate kitchen*** (kitchen type (separate kitchen: with water tap - 1, without water tap - 2; no separate kitchen - 3).<br>• Ventilation of the dwelling unit: ***good*** (good - 1, satisfactory - 2, bad - 3)<br>• Access of the household to bathroom: ***No bathroom***, (exclusive use of household - 1, common use of households in the building - 2, public/ community use without payment - 3, public/community use with payment - 4, others - 9, no bathroom - 5).<br>• Type of bathroom used by the household: ***attached to the dwelling unit*** (used: attached to the dwelling unit-1, detached to the dwelling unit but within the household premises-2, other-9, not used-3)<br>• Whether the household has electricity for domestic use?: ***Yes*** (yes - 1, no - 2).<br>• Type of electric wiring: ***temporary*** (conduit wiring - 1, fixed to the walls - 2, temporary - 3).<br>• Type of fuel used by household for cooking: ***LPG*** (firewood, chips & crop residue - 01, LPG - 02, other natural gas - 03, dung cake - 04, kerosene - 05, coke / coal - 06, gobar gas - 07, other biogas - 08, charcoal - 09, electricity (incl. generated by solar or wind power generators) - 10, solar cooker - 11, others - 19, no cooking arrangement - 12). |

[1]*Pucca* structure as defined in NSO report is a structure whose walls and roofs were made of pucca materials such as cement, concrete, oven burnt bricks, hollow cement/ash bricks, stone, stone blocks, jack boards (cement plastered reeds), iron, zinc or other metal sheets, timber, tiles, slate, corrugated iron, asbestos cement sheet, veneer, plywood, artificial wood of synthetic material and poly vinyl chloride (PVC) material.

The index for each State and group has been constructed for rural, urban and (rural + urban) combined for India for 2012 and 2018. For directional uniformity, the negative indicators - less of which is desirable - are transformed to indicate the desired positive outcomes by deducting them from 100 (as all indicators are in per cent). For instance, "percentage of households with no bathroom", which is a negative indicator, is converted to "percentage of households having bathroom", which is a positive indicator. The index is constructed by first aggregating the indicators for each dimension, and then the dimensions are aggregated using their scores for the particular State/group. Arithmetic mean is used for aggregation. The score for an indicator for particular State/group is calculated using the formula below:

$$\text{Indicator Score} = \frac{\text{Actual value-Minimum value (fixed at 0)}}{\text{Maximum value (fixed at 100) - Minimum value (fixed at 0)}}$$

The value of the index ranges between 0 and 1. Higher the value of index, better is the access to the bare necessities.

## OVERALL BNI

10.5 State-wise values of BNI in 2012 and 2018 for India (rural + urban), rural and urban are plotted respectively in Figures 1, 2, and 3. A higher value indicates better access to bare necessities in a State. The three colours, green, yellow and red, used in the maps show the level of a State in providing access to bare necessities to its households. Green (above 0.70) indicates 'High' level and is therefore the most desirable, followed by yellow (0.50 to 0.70), which indicates 'Medium' level. In contrast, Red (below 0.50) indicates very 'Low' level of access. The difference in colours in a map indicate the regional variation in the access to bare necessities for the households.

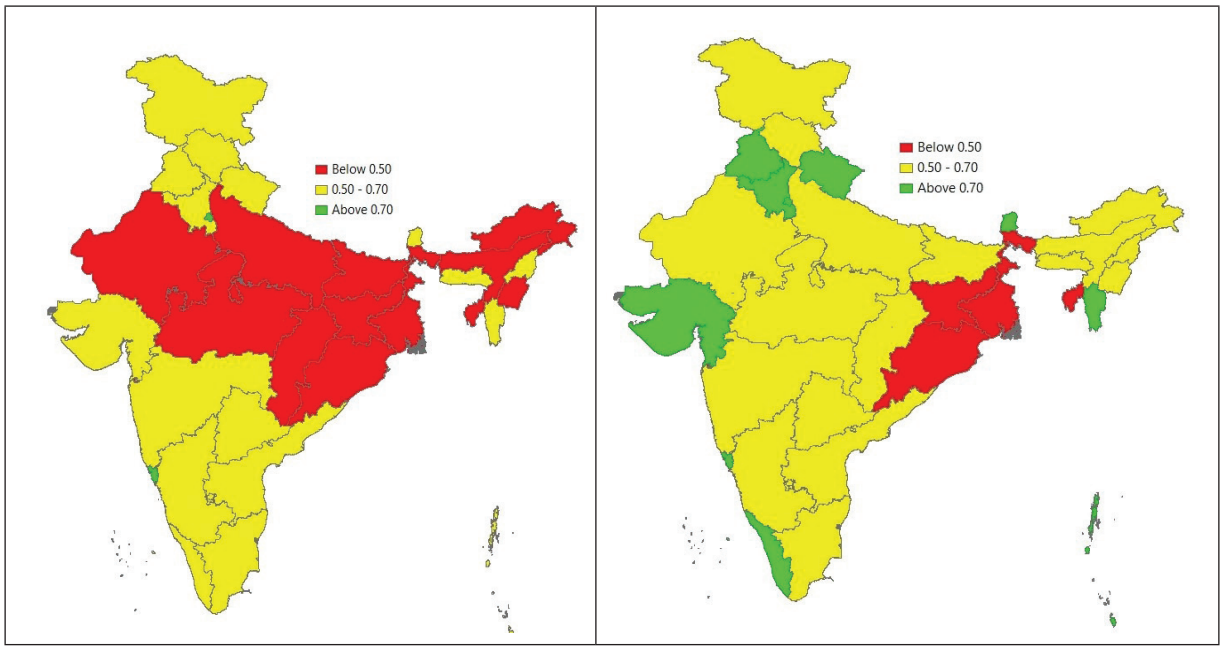
10.6 It is quite evident from Figure 1 that in most of the states, the access to bare necessities for the households in 2018 is significantly better compared to 2012. Access to bare necessities in 2018 is the highest in the States such as Kerala, Punjab, Haryana, Gujarat, Uttrakhand, Delhi, Goa, Mizoram and Sikkim while it is the lowest in Odisha, Jharkhand, West Bengal and Tripura. The states showing improvement on the access to bare necessities, where red in 2012 became yellow or green in 2018 or where yellow in 2012 became green in 2018, are Haryana, Punjab, Uttarakhand, Gujarat, Kerala, Rajasthan, Uttar Pradesh, Bihar, Madhya Pradesh, Chhattisgarh, and North East states except for Tripura, Nagaland and Meghalaya.

10.7 In rural India, the highest access to bare necessities in 2018 is recorded in Punjab, Kerala, Sikkim, Goa and Delhi, while the lowest in Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand, West Bengal, Odisha, Assam, Manipur and Tripura. The States showing improvement in their access to bare necessities are J&K, Punjab, Rajasthan, Gujarat, Maharashtra, Karnataka, Chhattisgarh, Tamil Nadu, Andhra Pradesh, Kerala, Goa, Meghalaya and Arunachal Pradesh.

In urban India, no State is showing the lowest level of BNI in 2018, and the States showing improvement over 2012 include Uttarakhand, J&K, Punjab, Rajasthan, Madhya Pradesh, Maharashtra, Karnataka, Kerala, Tamil Nadu, Arunachal Pradesh and Manipur.

**Figure 1: Improvement in the Bare Necessities Across India (Rural + Urban) from 2012 to 2018**

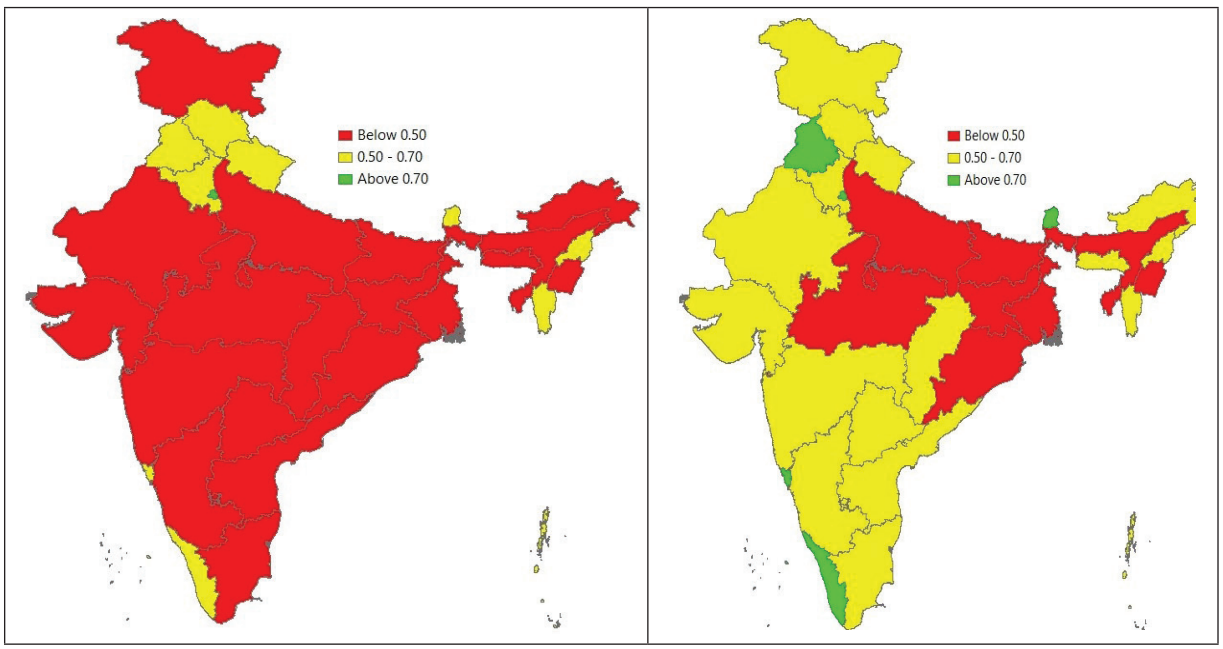
BNI for India (Rural + Urban) 2012 BNI for India (Rural + Urban) 2018




Source: Survey calculations.

**Figure 2: Improvement in the Bare Necessities Across Rural India from 2012 to 2018**

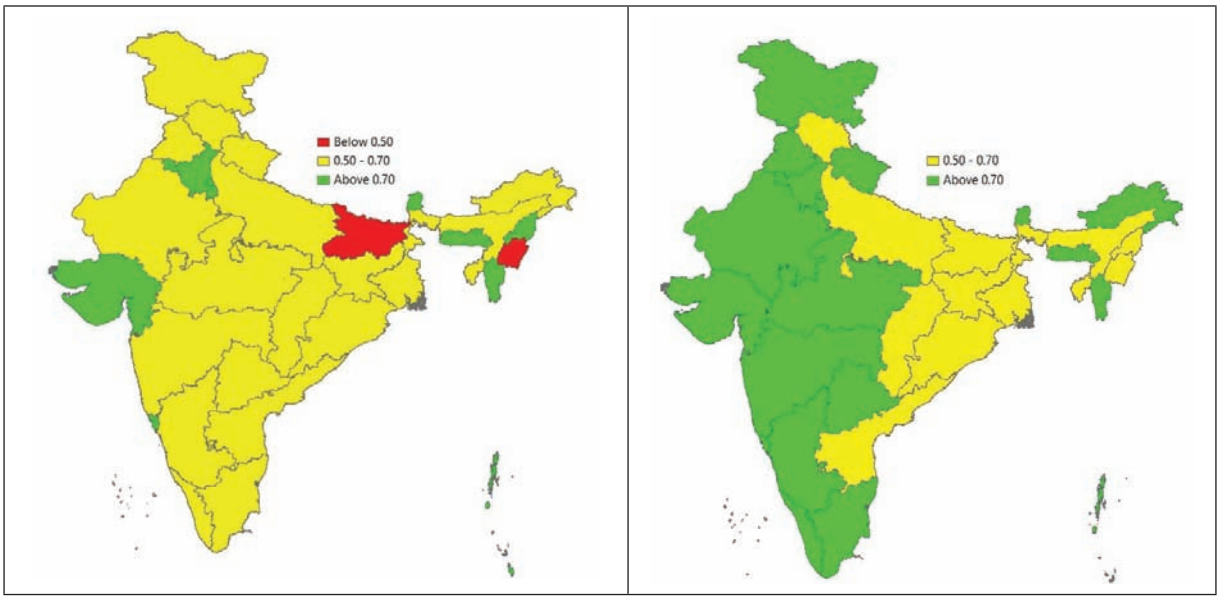
BNI for Rural India 2012 BNI for Rural India 2018




Source: Survey calculations.

**Figure 3: Improvement in the Bare Necessities Across Urban India from 2012 to 2018**

BNI for Urban India 2012 BNI for Urban India 2018



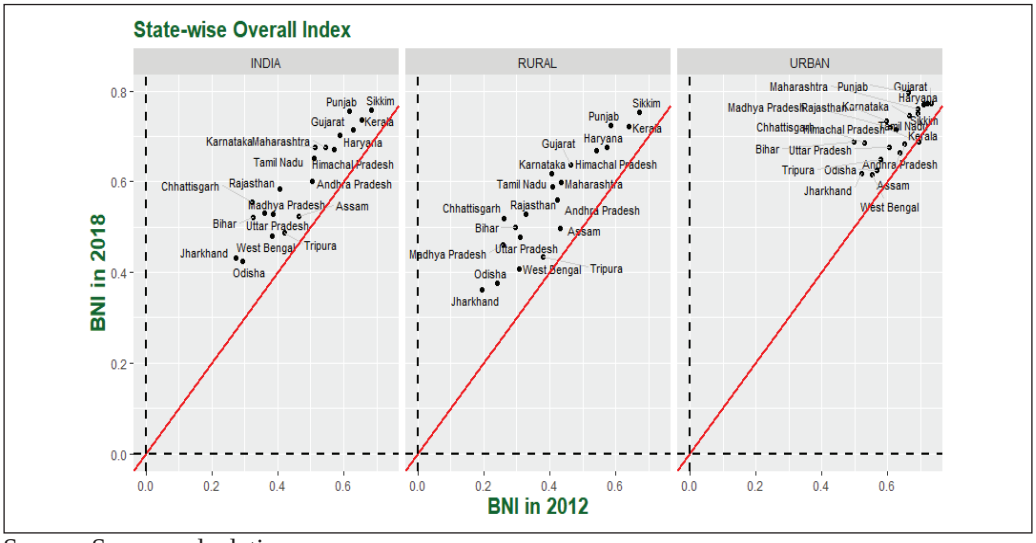

Source: Survey calculations.

10.8 Figure 4 plots the level of BNI for the selected States[2] in 2012 and 2018. The red 45° line represents the benchmark for no change between 2012 and 2018 with which we can compare each State. A State located above the red line shows improvement while one below the red 45° line shows deterioration in 2018 from its level in 2012. The vertical distance from the red line indicates the extent of change for a State. The farther a State is located above the red line, the higher are the gains. As reflected in the all-India index, access to bare necessities is high in the States such as Kerala, Punjab, Haryana and Gujarat while lowest in Odisha, Jharkhand, West Bengal and Tripura. Since all States are above the 45° red line, it is evident that access to bare necessities has secularly improved in 2018 compared to 2012 (Figure 4). The improvement is significantly higher in the rural areas when compared to the urban areas. However, variation in the access to bare necessities across states and between rural and urban remained large.

10.9 Figure 5 plots gains per year against the value of the index in 2012. Gains per year indicates the speed of improvement in a year on access to bare necessities for households in a State. Gains per year are calculated by subtracting the index value in 2012 for a State from its value in 2018 and dividing by the number of years between 2012 and 2018. The decline in regional disparities reflect in the negative association between level of the index in 2012 and the per year gains. Figure 5 shows that inter-State disparities in terms of access to bare necessities to the households have declined both in rural as well as in urban areas. States that had low level of access to bare necessities in 2012 have gained relatively more between 2012 and 2018.

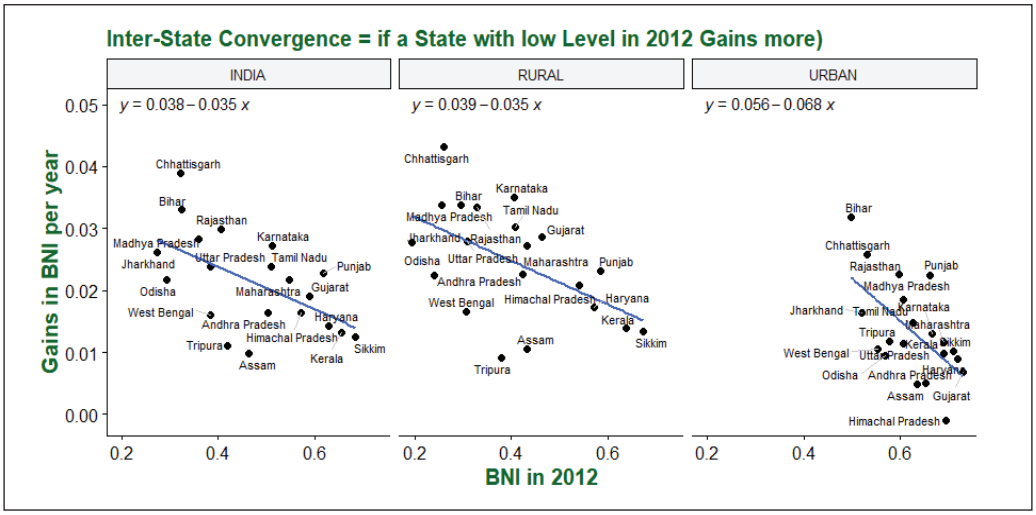
[2]Excluding small states performance of which may vary because of their nature of governance, special needs, and size such as Goa, Delhi, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, J&K, Uttarakhand, and Union Territories.

**Figure 4: Improvements in Access to Bare Necessities in 2018 vis-à-vis 2012**




Source: Survey calculations.

**Figure 5: Change in Regional Disparities of Access to Bare Necessities**

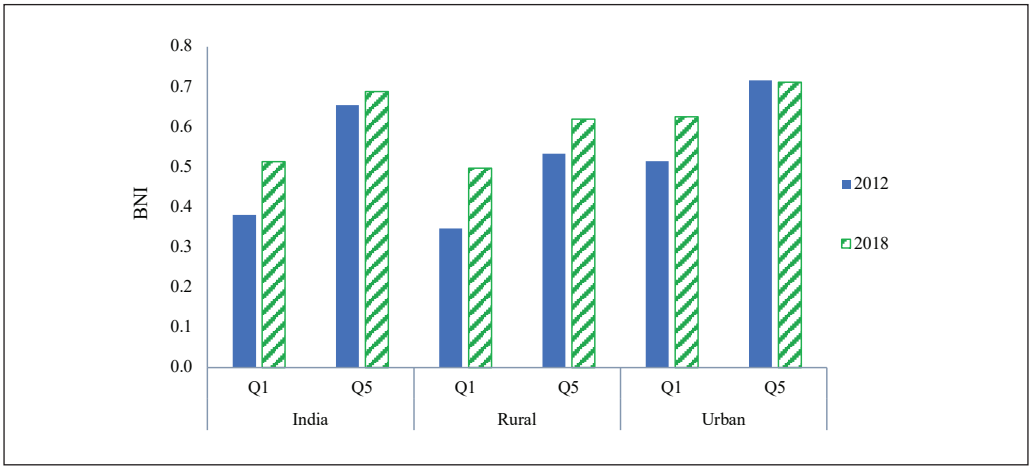



Source: Survey calculations.

10.10 Figure 6 plots the BNI for 2012 and 2018 across the income groups with the lowest quintile (Q1) corresponding to the poorest and the highest quintile (Q5) corresponding to the richest as per the monthly per capita expenditure[3]. We can see that the access to bare necessities has improved disproportionately more for the poorest households when compared to the richest households across India (urban + rural), rural as well as urban areas. The improvement in equity is particularly noteworthy because while the rich can seek private alternatives, lobby for better services, or if need be, move to areas where public goods are better provided for, the poor rarely have such choices (Besley and Ghatak, 2004). Thus, provision of public goods can particularly affect the quality of living of the vulnerable sections in a society.

[3]The expenditure includes expenditure on purchase of household durables during last 365 days, imputed value of usual consumption in a month from wages in kind, free collection, gifts, etc, imputed value of usual consumption in a month from home grown stock and other purchases for household purposes.

**Figure 6: Improving Equity in Access to Bare Necessities**



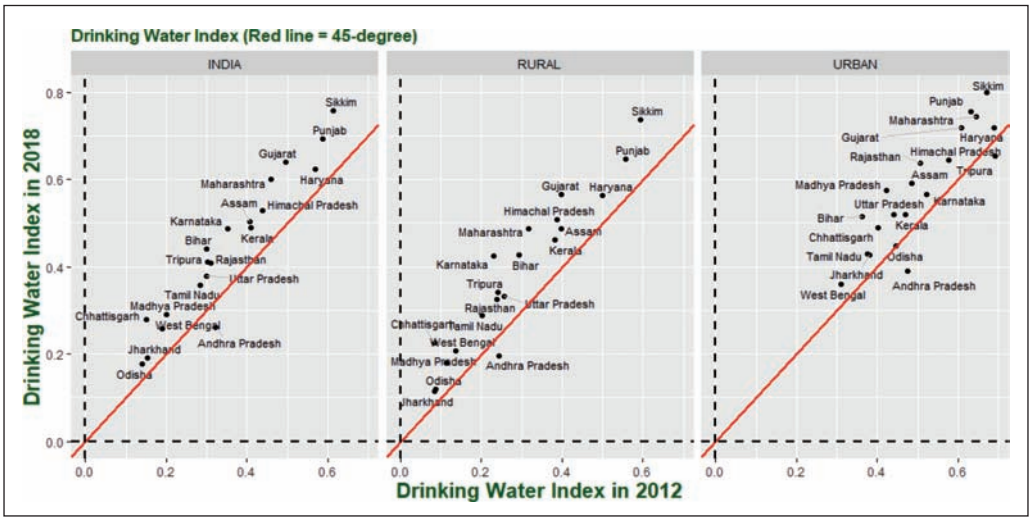

Source: Survey calculations.

## DRINKING WATER ACCESSIBILITY INDEX

10.11 The sub-index for access to drinking water, drinking water accessibility index, is composed of sub-dimensions viz., the principal source of drinking water, distance from source of water, nature of access, and method of taking out water. The indicators included from these sub-dimensions are in terms of the per cent of households that have piped water into dwelling or piped water to yard/plot, within dwelling or outside dwelling but within premises, have water through tap, and exclusive use of the household or not.

10.12 The values of drinking water accessibility index for combined India, rural and urban for 2012 and 2018 are plotted in Figure 7. Most of the States are above the line, suggesting that the access to drinking water to households in most of the States has improved in 2018 compared to 2012, in rural as well as in urban areas, (except for Andhra Pradesh in Rural and Andhra Pradesh and Himachal Pradesh in urban areas). States such as Sikkim, Punjab, Haryana and Gujarat are

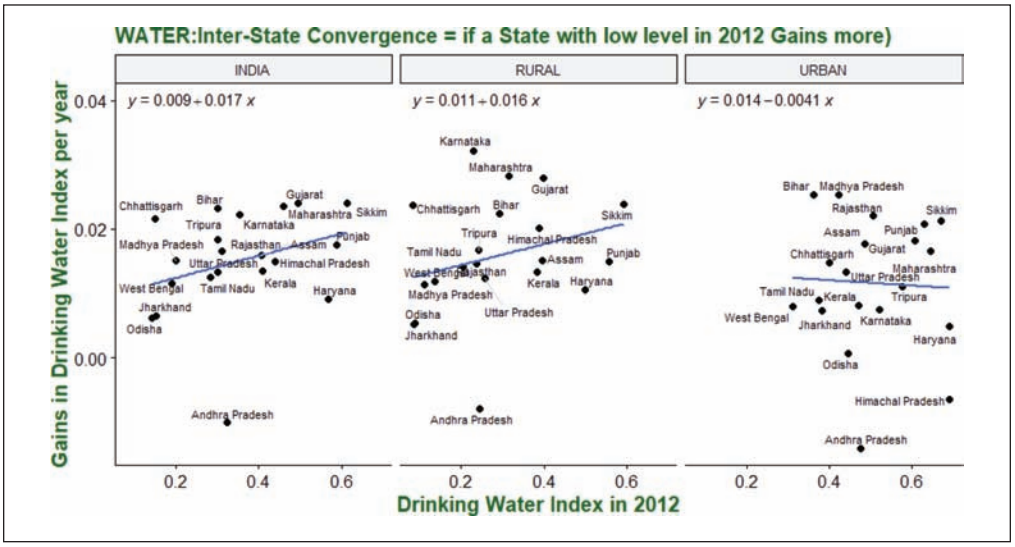
**Figure 7: Improvements in Access to Drinking Water in 2018 vis-à-vis 2012**




Source: Survey calculations.

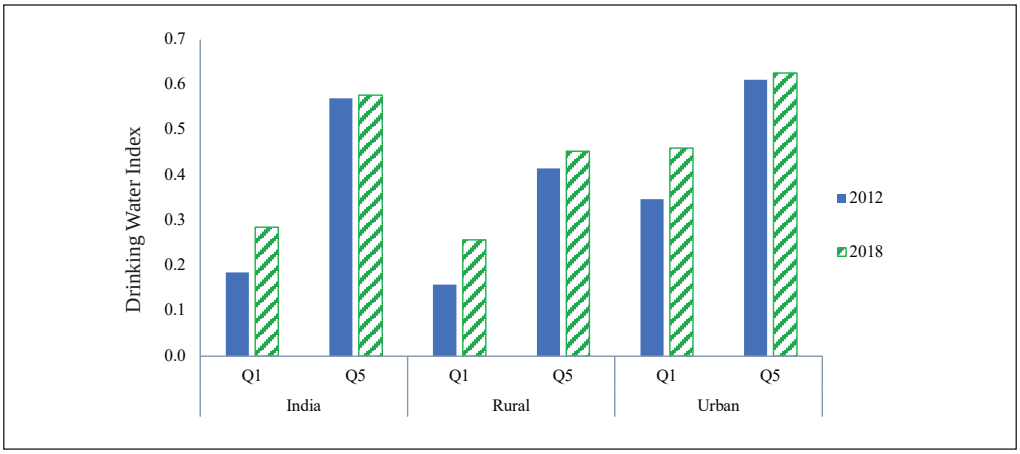
at the top while Odisha, Jharkhand and Andhra Pradesh are at the bottom on the drinking water accessibility index. Regional disparities have increased in 2018 when compared to 2012 despite such disparities declining in urban areas (Figure 8). This is because these disparities have increased in the rural areas. The Jal Jeevan mission must therefore focus on reducing the disparities in the rural areas as the reduction in such disparities will reduce the disparities across India. Across all groups, equity in access to drinking water increased in 2018 when compared to 2012 (Figure 9).

**Figure 8: Regional Disparities in Access to Drinking Water**




Source: Survey calculations.

**Figure 9: Increasing Equity in Access to Drinking Water**




Source: Survey calculations.

## SANITATION INDEX

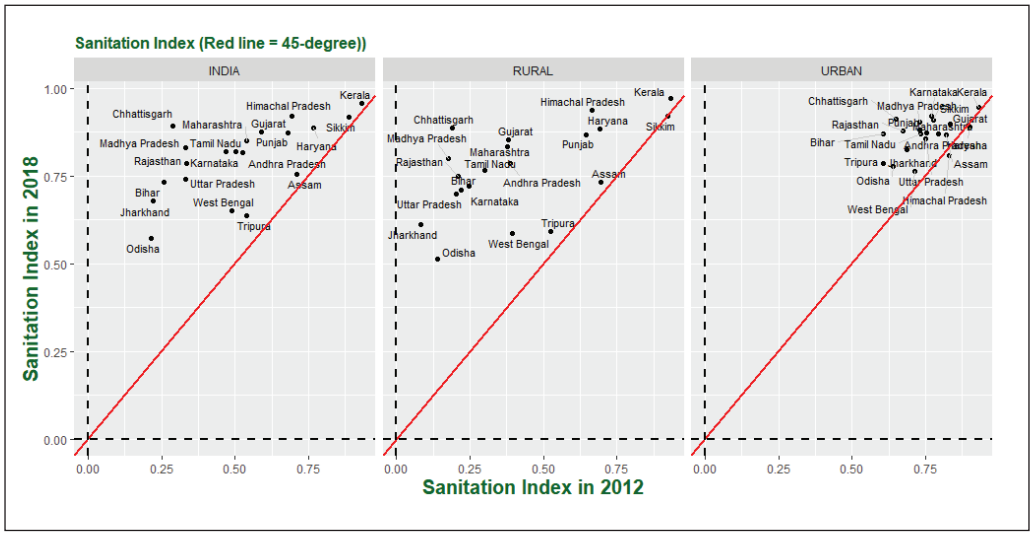
10.13 Indicators used in the sub-index are percentage of households by access to latrine for exclusive use, the type of latrine viz., piped sewer system, septic tank, twin leach pit, single pit.

[4]The indicator is about the physical access not about the use. Various survey such as National Annual Rural Sanitation Survey (NARSS) 2018-19 shows that most of household who have latrine are also using them.

These indicators show physical as well as quality of access to sanitation[4]. Figure 10, which plots the level of access to sanitation for States, shows that the sanitation access has improved for all States in rural areas and for most of the States in urban areas in 2018 compared to 2012. Regional disparities in access to sanitation has declined as the states having low access to sanitation in 2012 have gained more (Figure 11). However, inter-State difference in access to sanitation are still large, especially in rural areas. The level of access to safe sanitation has increased in lowest income quintile, both in rural as well as in urban areas (Figure 12).

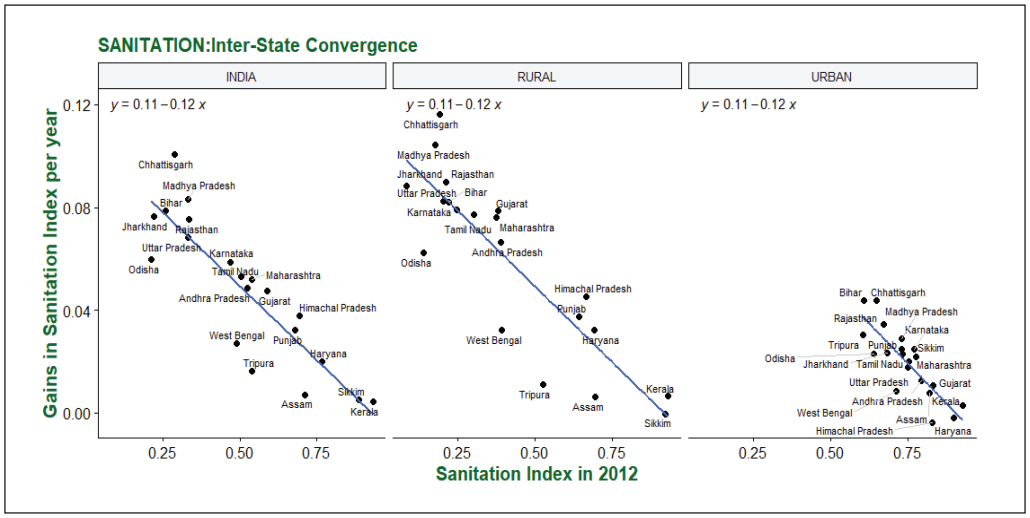
10.14 In continuation of the efforts made by the government through various government programmes, such as Total Sanitation Campaign, Government launched Swachh Bharat Mission in 2014. Under the programme, more than 10 crore toilets were built in rural areas. The programme has been critical in enhancing the access to safe sanitation to rural households.

**Figure 10: Improvements in Access to Sanitation in 2018 vis-à-vis 2012**



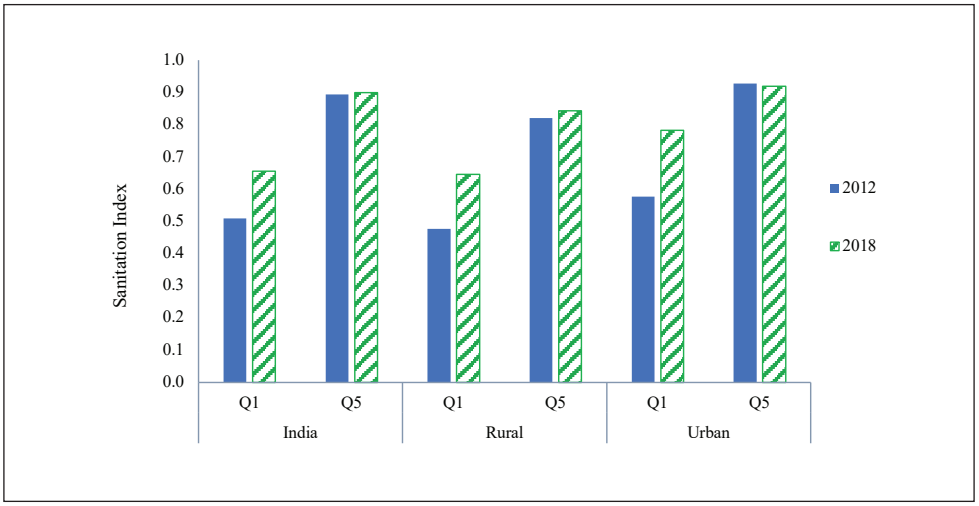

Source: Survey calculations.

**Figure 11: Sharp Convergence Across States in Sanitation**




Source: Survey calculations.

**Figure 12: Increasing Equity in Sanitation**

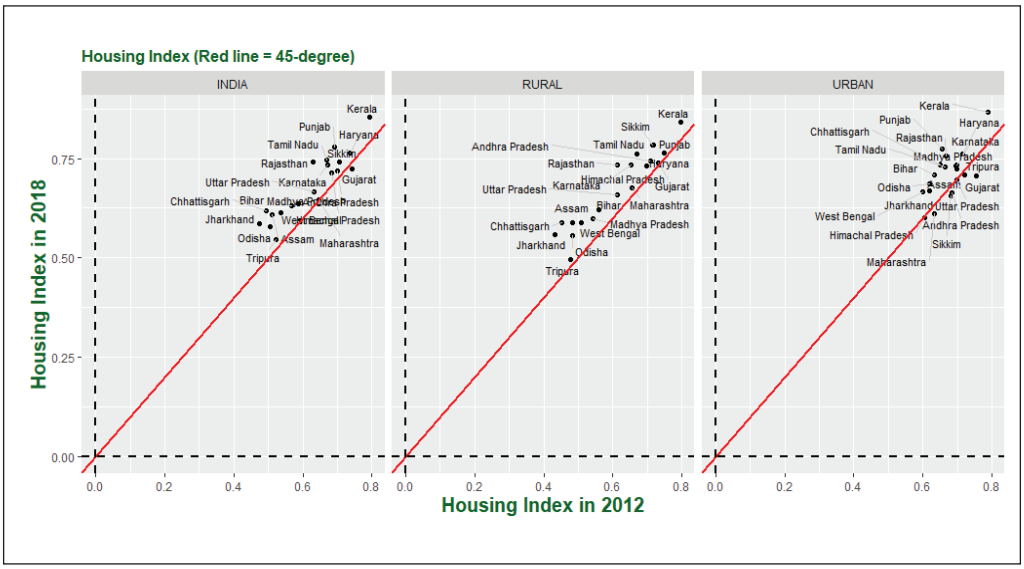



Source: Survey calculations.

## HOUSING INDEX

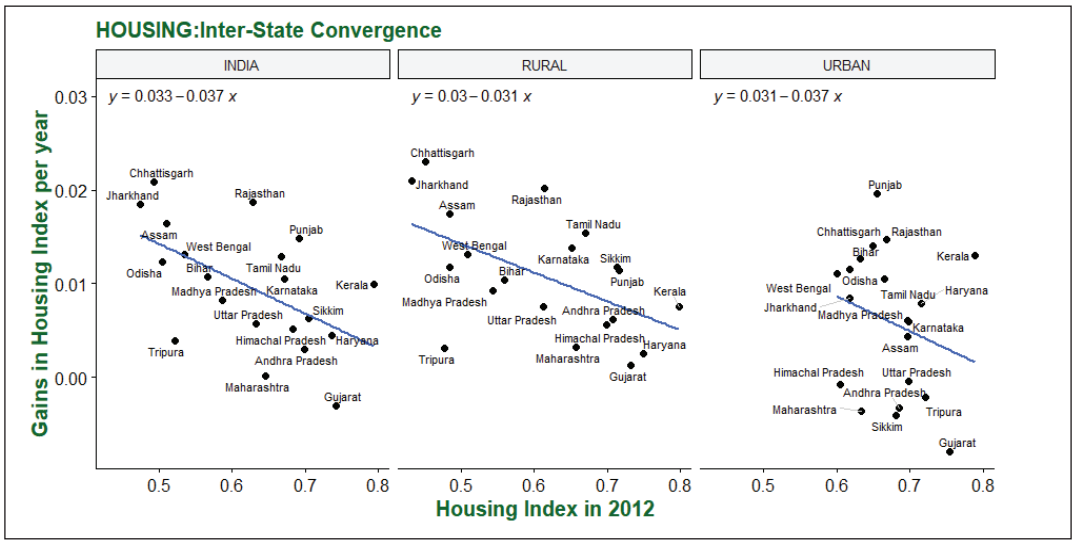
10.15 The housing index measures not only the structure of house (in terms of *Pucca* or *Katcha*), but also the quality of house in terms of type of dwelling unit (independent or not) and condition of structure (Good or not). Figure 13 shows that the access to housing has improved in all States, except urban areas in few States. The inter-State disparities have also declined as the States having low level in 2012 have gained more (Figure 14). However, the gaps in the levels across states have been large, especially in rural areas. The improvement in access to housing has also been disproportionately greater for the lowest income group when compared to the highest income group, thereby enhancing equity in access to housing in 2018 vis-à-vis 2012 (Figure 15).

**Figure 13: Improvements in Access to Housing in 2018 vis-à-vis 2012**



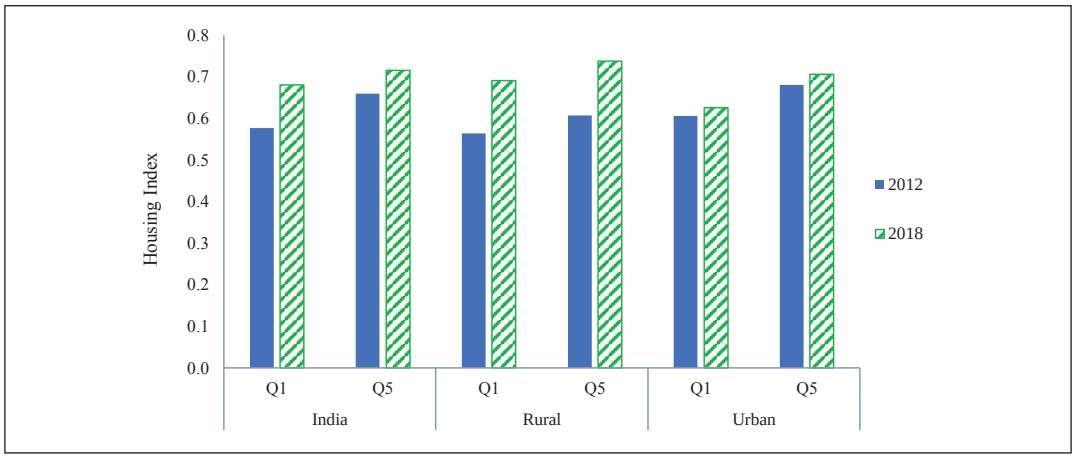

Source: Survey calculations.

**Figure 14: Convergence Across States in Access to Housing**




Source: Survey calculations.

**Figure 15: Increasing Equity in Access to Housing**



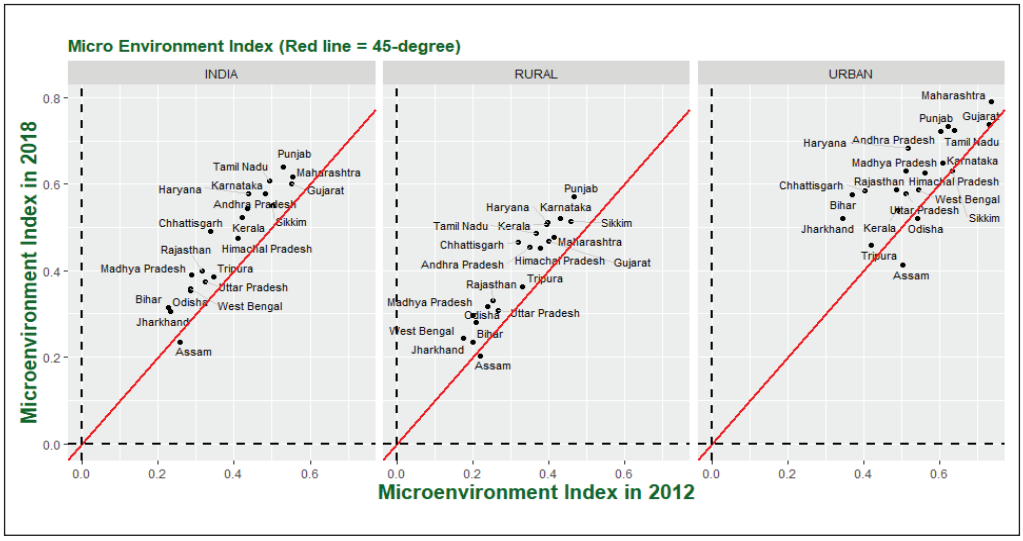

Source: Survey calculations.

## MICRO-ENVIRONMENT INDEX

10.16 The micro-environment index measures the percentage of households who are living in a dwelling unit with access to drainage (indicated in terms of access to drainage and quality of drainage in terms of other than *Katcha* drainage), without problems of flies/mosquitoes (indicated by other than severe), and efforts made by local bodies/State government to tackle problem of flies/mosquitoes.

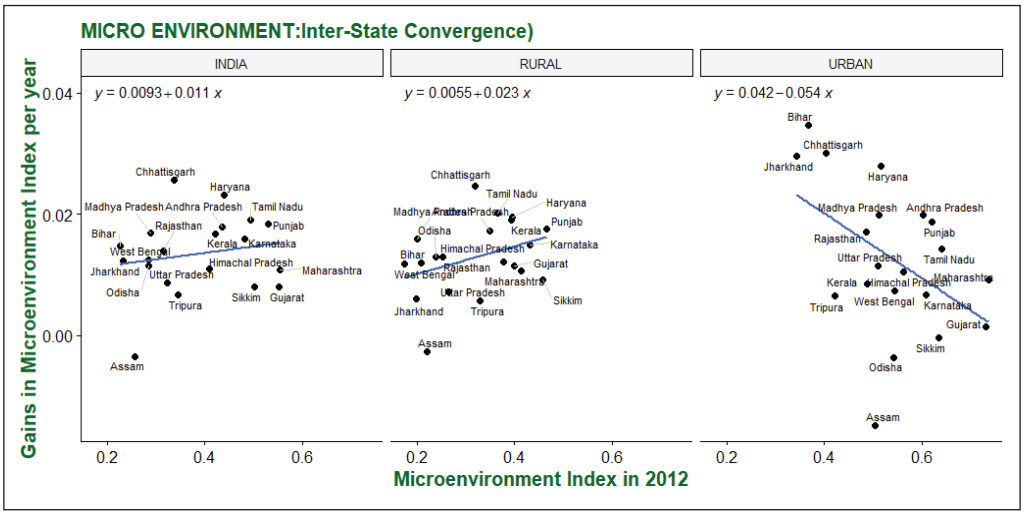
11.17 Micro-environment, as measured by the index, has improved in 2018 for all States, except for Assam in rural and Odisha and Assam in urban areas, as compared to 2012 (Figure 16). Regional disparities have declined sharply in urban areas in 2018 vis-à-vis 2012, though it was increased in the rural areas (Figure 17). The micro-environment is much better in urban areas when compared to the rural areas, and the rural-urban gaps are large. The access to micro-environment in 2018 has improved especially to the lowest income quintile in rural as well as in urban areas (Figure 18).

**Figure 16: Improvements in Micro-environment in 2018 vis-à-vis 2012**



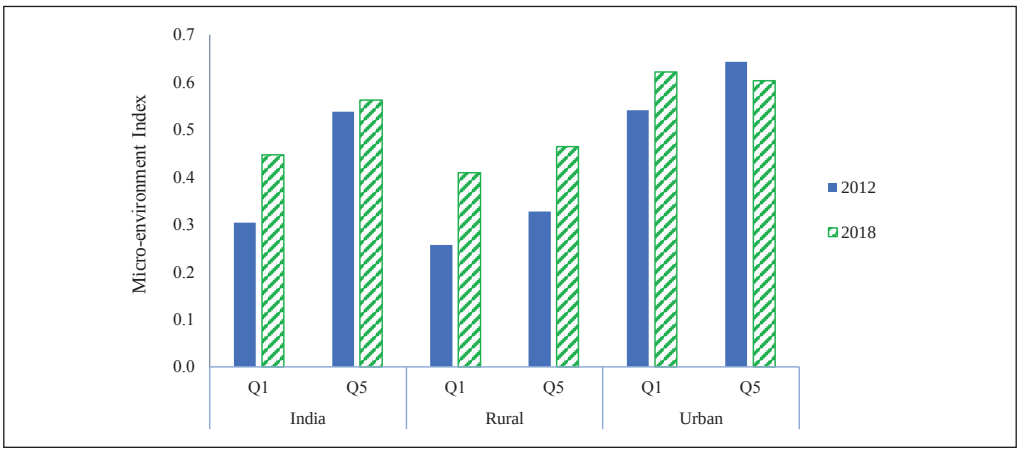

Source: Survey calculations.

**Figure 17: Regional Disparities in Micro-environment**




Source: Survey calculations.

**Figure 18: Increasing Equity in Micro-environment**



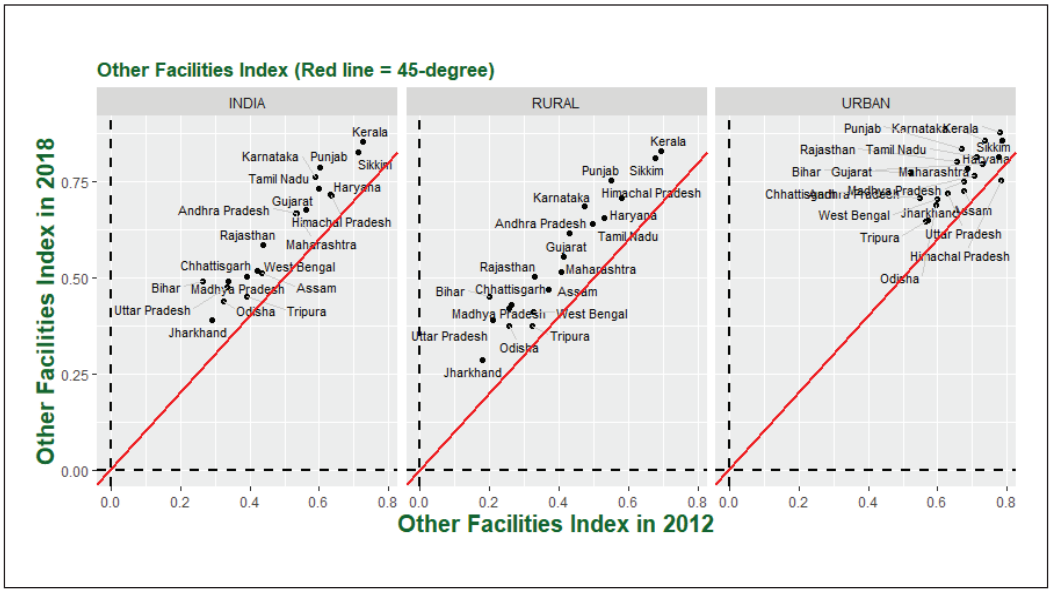

Source: Survey calculations.

## OTHER FACILITIES INDEX

10.18 'Other facilities' index captures the availability of kitchen, kitchen with a water tap, good ventilation in house, access to bathroom, attached bathroom, electricity use, the types of wiring used instead of temporary electric wiring, and type of fuel used for cooking (LPG or others).

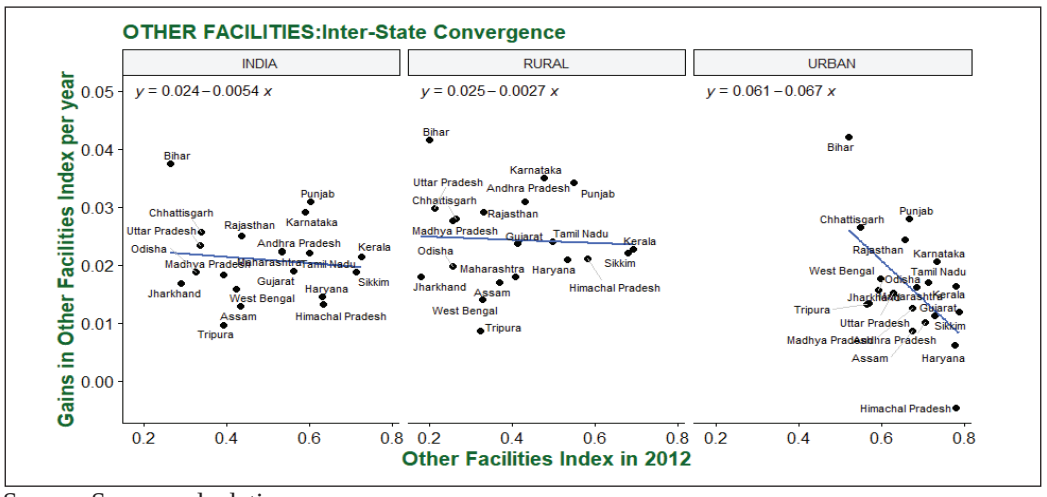
10.19 Access to Other-facilities for a household has improved for all States in 2018 compared to 2012 for rural as well as in urban areas except for Himachal Pradesh in urban (Figure 19). The inter-states disparities in terms of these facilities have also declined, especially in the urban areas (Figure 20). The equity in access to other facilities has improved in rural and urban areas (Figure 21). The gaps are still high across the State in rural, between rural and urban in States, between income groups, and between rural and urban in income groups.

**Figure 19: Improvements in Access to Other Facilities in 2018 vis-à-vis 2012**



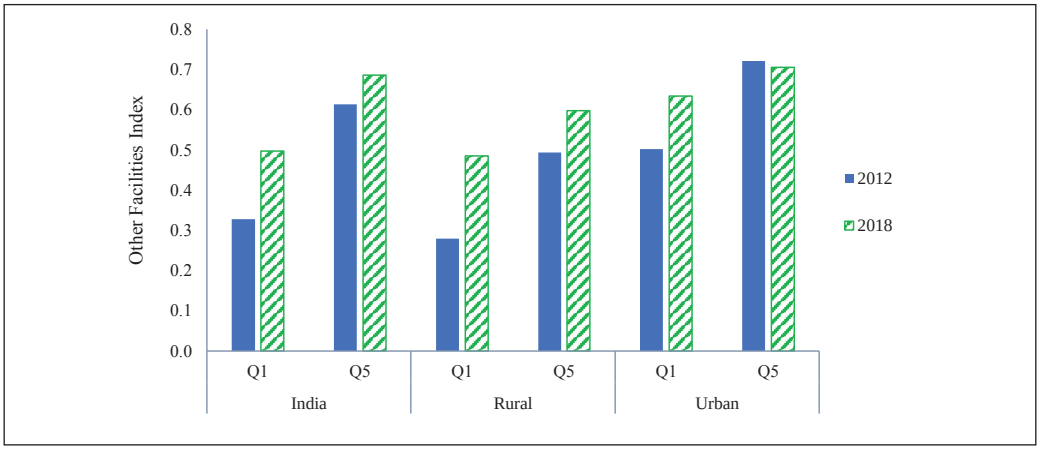

Source: Survey calculations.

**Figure 20: Convergence Across States in Access to Other Facilities**




Source: Survey calculations.

**Figure 21: Increasing Equity in Access to Other Facilities**




Source: Survey calculations.

## HEALTH OUTCOMES

10.20 Research highlights the health benefits that can accrue from greater access to the bare necessities examined above. The Economic Survey 2018-19 (Chapter 8, Volume 1) showed the benefits of the Swachh Bharat Mission, as it led to a decrease in diarrhea and malaria cases in children below five years, still births and new-borns with weight less than 2.5 kg. Geruso and Spears (2014) document similar effects on child survival of safe sanitation through the decline in open defecation. Access to improved sanitation also reduces the risk of contracting diarrhoea (Kumar and Vollmer, 2013; Jalan and Ravallion, 2003). Further, the access to the piped water and sanitation is critical in reducing the child mortality substantially (Zwane *et.al*., 2007). The distance and time spent on fetching water from the source is found to affect under-five child health (Pickering and Davis, 2012; Zayatri *et. al*., 2013) and increase the risk of illness (Xia and Hunter, 2010).

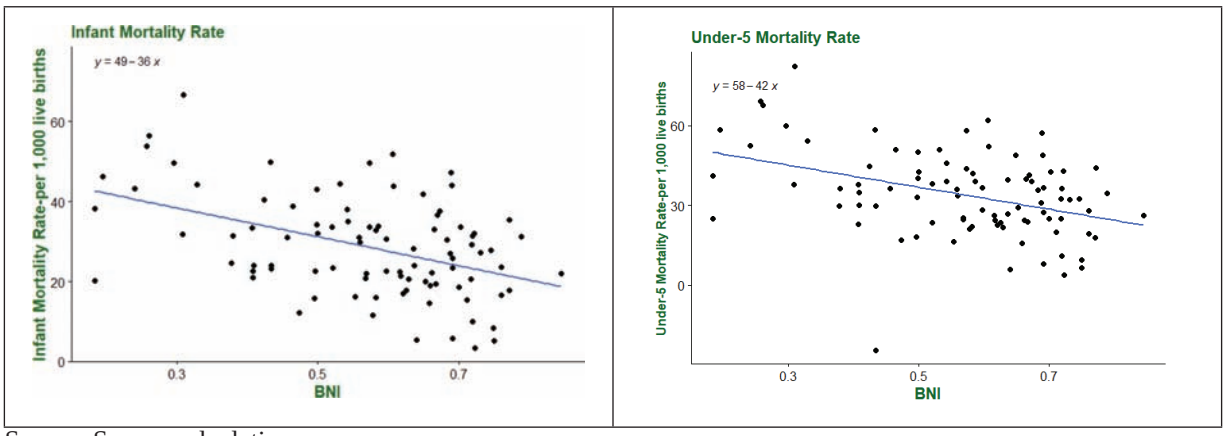
10.21 Research also supports the view that access to clean cooking fuel improves child health. Studies have found a significant trend for higher infant mortality among households that cooked with a greater proportion of biomass fuel (Rinne *et.al*., 2007). The close association between household air pollution and mortality among children aged under-five, possibly because of respiratory illnesses, support the case for providing clean cooking fuel through government programmes (Naz *et. al*., 2016). Having a separate kitchen improves the indoor environment, thereby yielding health benefits to the household, especially women and children. Access to housing, better housing conditions and amenities are closely connected with health outcomes (Thomson *et. al*., 2017).

10.22 Motivated by the various studies described above, we correlate the BNI with health outcomes in India. Figure 22 plots the correlation of BNI with infant mortality rate and under-5 mortality rate[5] for rural and urban areas; the data for both from NFHS-4 and NFHS-5 against the corresponding levels of BNI. The close associations suggest bare necessities correlate strongly with health outcomes. Table 2 shows the results from a panel regression that controls for the effect

[5]State-wise data on IMR and under-5 MR are taken from NFHS-4, 2015-16 and NFHS-5, 2019-20 (for 22 States/ UT where data has been released).

of State level differences by including State fixed effects (FE). The results seen in Figure 22 remain robust and thereby suggest that the effect of BNI on health outcomes are likely to be causal.

**Figure 22: Infant and Under-5 Mortality Rates**




Source: Survey calculations.

**Table 2: Regression Results: Health and Education Indicators and BNI**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Dependent variable:** | **Infant Mortality Rate (per 1,000 live births)** | **Under-5 Mortality Rate (per 1,000 live births)** | **Gross Enrolment Ratio Class 9-10** | **Gross Enrolment Ratio Class 11-12** |
| BNI | -26.21*** | -30.63*** | 86.33*** | 46.11** |
| | (7.375) | (9.930) | (12.86) | (18.80) |
| Constant | 45.37*** | 53.68*** | 24.91*** | 23.93** |
| | (5.431) | (6.212) | (7.685) | (11.52) |
| Observations | 91 | 90 | 59 | 59 |
| R-squared | 0.751 | 0.677 | 0.874 | 0.851 |
| State FE | Yes | Yes | Yes | Yes |

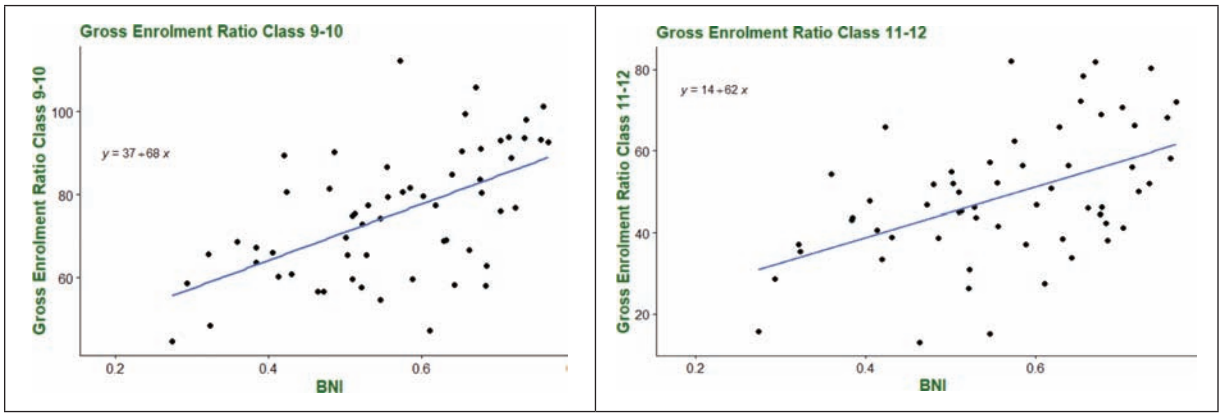
Source: Survey calculations.
Note: Robust standard errors clustered by State in parentheses; *** p<0.01, ** p<0.05, * p<0.1

## EDUCATION OUTCOMES

10.23 Research studies support that the access to bare necessities through its possible linkages can positively impact educational indicators as well. Water hauling, a daily activity, consumes substantial time and effort of a household. It is found that water hauling activity is negatively associated with the girls' school attendance (Nauges and Strand, 2011; Sekhri, 2013). Access to latrine in schools substantially increases enrolment of pubescent-age girls (Adukia, 2016). Further, the electrification's links with education, which could be through lighting and use of other equipment, are visible in day-to-day life. In fact, there is a strong correlation between electricity consumption per capita and higher scores on the education index across countries (Makoto and Nakata, 2008). In view of the above, it is pertinent to explore relation, if any, between BNI levels and education indicators.

10.24 The State-wise BNI in 2012 and 2018 correlate positively with the gross enrolment ratio[6] for class 9-10 and class 11-12 (Figure 23). The panel regression results presented in Table 1 are also statistically significant suggesting that high level of the gross enrolment ratio in the schools could be linked with BNI.

**Figure 23: BNI India and Gross Enrolment Ratio**




Source: Survey calculations.

## CONCLUSION

10.25 Using the composite index of bare necessities, this chapter summarizes the progress made in providing access to bare necessities for ensuring a healthy living. It was found that compared to 2012, access to "the bare necessities" has improved across all States in the country in 2018. The improvements are widespread as they span each of the five dimensions viz., access to water, housing, sanitation, micro-environment and other facilities. Inter-State disparities in the access to "the bare necessities" have declined in 2018 compared to 2012 across rural and urban areas. This is because the States where the level of access to "the bare necessities" was low in 2012 have gained relatively more between 2012 and 2018. Access to "the bare necessities" has improved disproportionately more for the poorest households when compared to the richest households across rural and urban areas. The improvement in equity is particularly noteworthy because while the rich can seek private alternatives, lobby for better services, or if need be, move to areas where public goods are better provided for, the poor rarely have such choices. It was also found that the improved access to "the bare necessities" has led to improvements in health indicators and in education indicators. However, while improvements in access to bare necessities are evident, the disparities in access to bare necessities continues to exist between rural-urban, among income groups and also across States. Government schemes, such as the Jal Jeevan Mission, SBM-G, PMAY-G, may design appropriate strategy to address these gaps to enable India achieve the SDG goals of reducing poverty, improving access to drinking water, sanitation and housing by 2030. There should be effective targeting of the needier population be they in urban or rural areas or across states. As civic amenities in urban areas are also provided by the local self-governments, there must be effective convergence in scheme implementation at the Centre-State and local levels. For this purpose, a BNI based on large annual household survey data can be constructed using suitable indicators and methodology at district level for all/ targeted districts to assess the progress on access to bare necessities.

[6]Data for 2011-12 and 2018-19 sourced from Statistics of School Education 2011-12, Ministry of Education and for 2018-19 from U-DISE.

## CHAPTER AT A GLANCE

- Compared to 2012, access to "the bare necessities" has improved across all States in the country in 2018. Access to bare necessities is the highest in the States such as Kerala, Punjab, Haryana and Gujarat while it is the lowest in Odisha, Jharkhand, West Bengal and Tripura.
- The improvements are widespread as they span each of the five dimensions viz., access to water, housing, sanitation, micro-environment and other facilities. Inter-State disparities in the access to "the bare necessities" have declined in 2018 when compared to 2012 across rural and urban areas. This is because the States where the level of access to "the bare necessities" was low in 2012 have gained relatively more between 2012 and 2018.
- Access to "the bare necessities" has improved disproportionately more for the poorest households when compared to the richest households across rural and urban areas. The improvement in equity is particularly noteworthy because while the rich can seek private alternatives, lobby for better services, or if need be, move to areas where public goods are better provided for, the poor rarely have such choices.
- Using data from the National Family Health Surveys, we correlate the BNI in 2012 and 2018 with infant mortality and under-5 mortality rate in 2015-16 and 2019-20 respectively and find that the improved access to "the bare necessities" has led to improvements in health indicators.
- Similarly, improved access to "the bare necessities" correlates with future improvements in education indicators. Thrust should be given to reduce variation in the access to bare necessities across states, between rural and urban and between income groups, on bare necessities. The schemes, inter alia, Jal Jeevan mission, SBM-G, PMAY-G, may design appropriate strategy to reduce these gaps.
- A BNI based on large annual household survey data can be constructed using suitable indicators and methodology at district level for all/targeted districts to assess the progress on access to bare necessities.

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