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Capital Spending in India: Bridging the Data Gaps

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Abstract

Building on our previous analyses of off-budget borrowing and subsidy spending, this paper extends the methodologies developed in earlier papers to critically examine capital expenditure (capex) reporting practices in India. Capex plays a pivotal role in economic development and fiscal policy, involving investments in durable assets that enhance productivity, generate employment, and foster private-sector participation. While the reported capex has risen significantly in recent years, a deeper examination reveals inconsistencies, data gaps, and misclassifications that undermine the accuracy, accountability, and effectiveness of these estimates. India's current reporting practices often obscure the true nature and impact of these investments. Significant portions of the reported capex are allocated to loans and advances to state governments, public sector enterprises, and debt repayment rather than direct asset creation. The paper compares India's reporting practices with international standards, emphasising the need for accrual accounting, comprehensive reporting, and eliminating misclassification of capex. It proposes adjusted capital spending estimates that align with the global standards and the reforms required to improve transparency and accountability practices in India.

Keywords: Capital Spending, Fiscal Transparency, Data Gaps, Government Finance Statistics, Public Finance Management

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1. Introduction

Capital expenditure (capex) is a cornerstone of economic development and fiscal policy, encompassing investments in physical and social infrastructure such as roads, bridges, railways, ports, energy plants, schools and hospitals. These investments create durable, non-financial assets that yield long-term economic benefits by enhancing productivity, generating employment, and fostering private-sector participation. Capex can also have strong multiplier effects, boosting growth by stimulating ancillary industries such as cement and steel, improving logistics efficiency, and addressing regional infrastructural disparities.

For a developing economy like India, where urbanisation and population growth drive the need for enhanced infrastructure, capital spending is essential for achieving long-term developmental goals sustainably. Given India's ambitious targets for economic expansion and social welfare improvements, the composition and effectiveness of its capex framework are crucial for both public service delivery and private sector competitiveness.

1.1 Scope and Objectives

This paper critically examines key issues surrounding capex in India, with a particular focus on:

1. **Centre and State-Specific Practices**: Understanding how the Centre and states allocate and manage asset creation in capital spending, identifying best practices and inefficiencies.
2. **Transparency and Reporting Challenges**: Evaluating expenditure reporting and classification inconsistencies, off-budget liabilities, and fiscal transparency issues.
3. **Alignment with International Standards**: Comparing India's reporting practices with global benchmarks to assess the need for reforms.
4. **Adjusted Capex Estimates**: Refining reported capex data to reflect actual nonfinancial asset creation.
5. **Policy Recommendations:** Proposing measures to enhance capex reporting, fiscal oversight, and governance structures.

1.2 Methodology and Approach

This paper utilizes a combination of government finance data, Comptroller and Auditor General (CAG) audit reports, International Monetary Fund's (IMF) fiscal transparency standards, and international accounting frameworks and best practices to critically assess India's capital spending framework.

The paper analyses capex trends at both the central and state levels. Since 2000, the reported capex has surged from approximately 2% to nearly 8% of GDP. As this paper explains, this is an overestimation primarily due to the inclusion of financial assets, such as loans and equity, in the calculation of capex. These practices are inconsistent with both India's official definitions of capex

and international standards, underscoring the need for improved transparency and alignment. Thus, this paper adjusts central and state capex to align with the Government Finance Statistics Manual (GFSM) 2014 definition of 'net acquisition of nonfinancial assets' and disaggregates public sector capital spending into government and PSE expenditures. The paper also spotlights several other data gaps that hinder public accessibility, oversight and accountability of public funds. Additionally, we explore international best practices in fiscal transparency and accountability.

This paper continues our previous work on off-budget borrowings (Gupta and James 2023) and estimating actual subsidy spending (Gupta, Malani, and Singh 2025) to bring attention to the data gaps hindering fiscal transparency in India.

The paper is structured as follows:

- Section II examines central and state capex trends, highlighting key sectors and regional variations.
- Section III evaluates international standards and best practices in capex reporting, comparing India's approach with global norms.
- Section IV explores the challenges in capex reporting, estimating adjusted capex after accounting for classification issues, fiscal transparency, and off-budget spending.
- Section V summarises these challenges in the form of data gaps in capital spending accounting by the Centre and the states, as spotlighted by the CAG.
- Sections VI and VII present policy recommendations and the agenda for improving capex reporting and transparency.
- Building on our previous research on the opacity of subsidy spending and off-budget borrowings, this paper comprehensively evaluates India's capital expenditure classification gaps as part of the overall agenda to improve fiscal transparency.

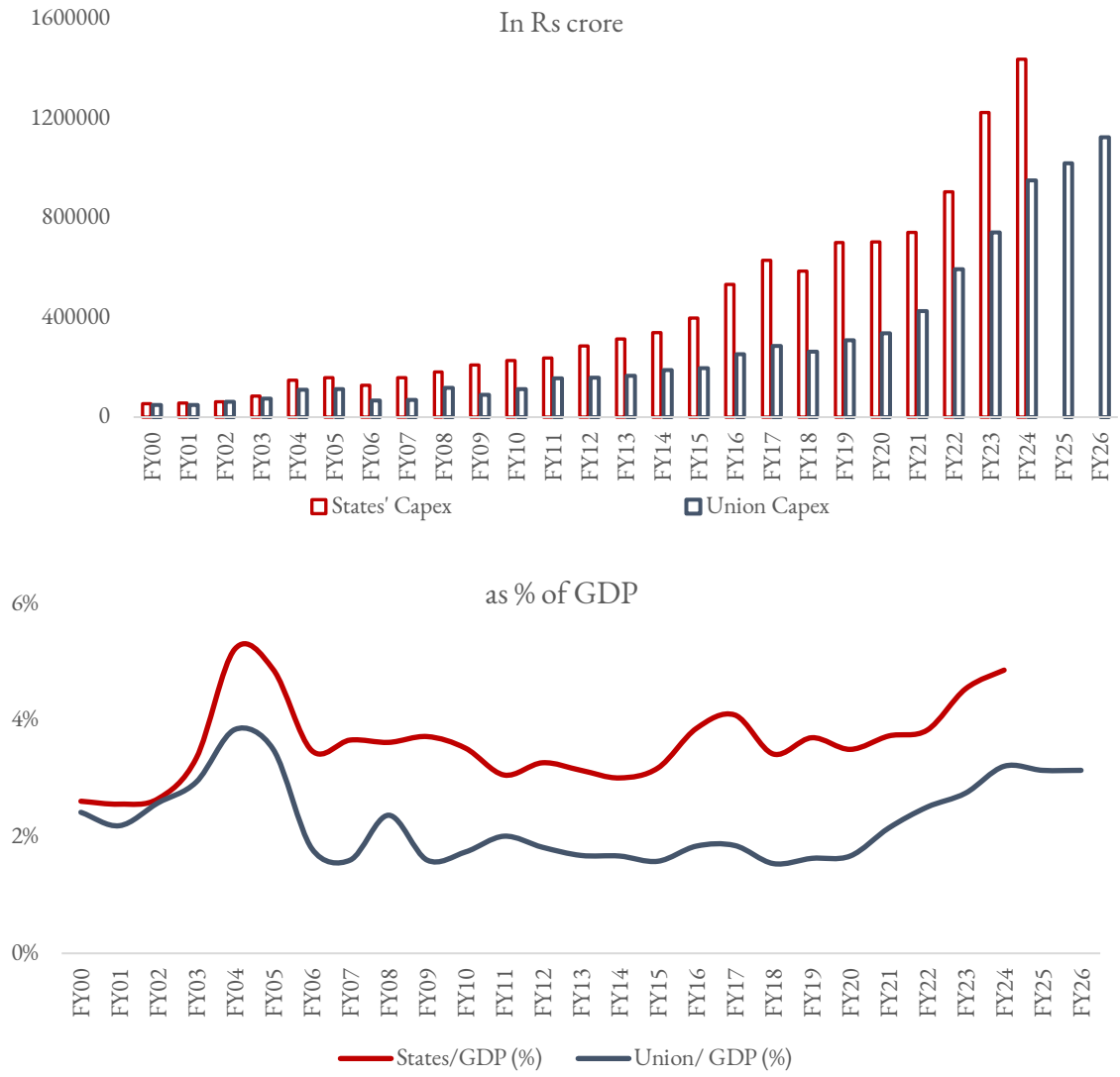
2. India's Capex Landscape

India's total capex is divided between the central and state governments[1]. Both levels of government have the authority to invest in infrastructure, health, education, and public services, although their spending priorities and capacities differ. While the central government primarily invests in national infrastructure—such as highways, rail networks, defence, and large-scale energy projects—state governments focus on localised infrastructure, public services, health, and education.

Since 2000, India has witnessed a significant increase in reported capex by the central and state governments, from approximately 2% of GDP to nearly 8% of GDP, with a pronounced acceleration in recent years. The reported capex has consistently risen since 2014 (Figure 1), reflecting the renewed focus on infrastructure, transportation, defence, and energy. Central flagship programs such as Bharatmala Pariyojana, Sagarmala, and the Smart Cities Mission underscore this strategic emphasis. These initiatives aim to modernise India's infrastructure and catalyse economic growth by attracting

private investment and enhancing the country's long-term growth potential. The reported central capex stood at 3.2% of the GDP in FY24, while the states' reported capex was estimated to be nearly 5%. Compared to the start of the millennium, the gap between the central and the states' capex has widened, with states spending much more, reflecting the increased devolution of funds following the 14th Finance Commission. A discussion, therefore, on the capex of both the tiers of government is warranted.

Figure 1: Union and States' Capex



Source: Union Budgets; Handbook of Statistics on Indian Economy, RBI; Handbook of Statistics on Indian States, RBI
Note: Data for States' cumulative capex in FY25 is unavailable.

2.1. Central Government's Capex

Since 2014, successive Union budgets have increasingly emphasised public investment as a key driver of economic growth. The central government has prioritised transport, energy, and urban

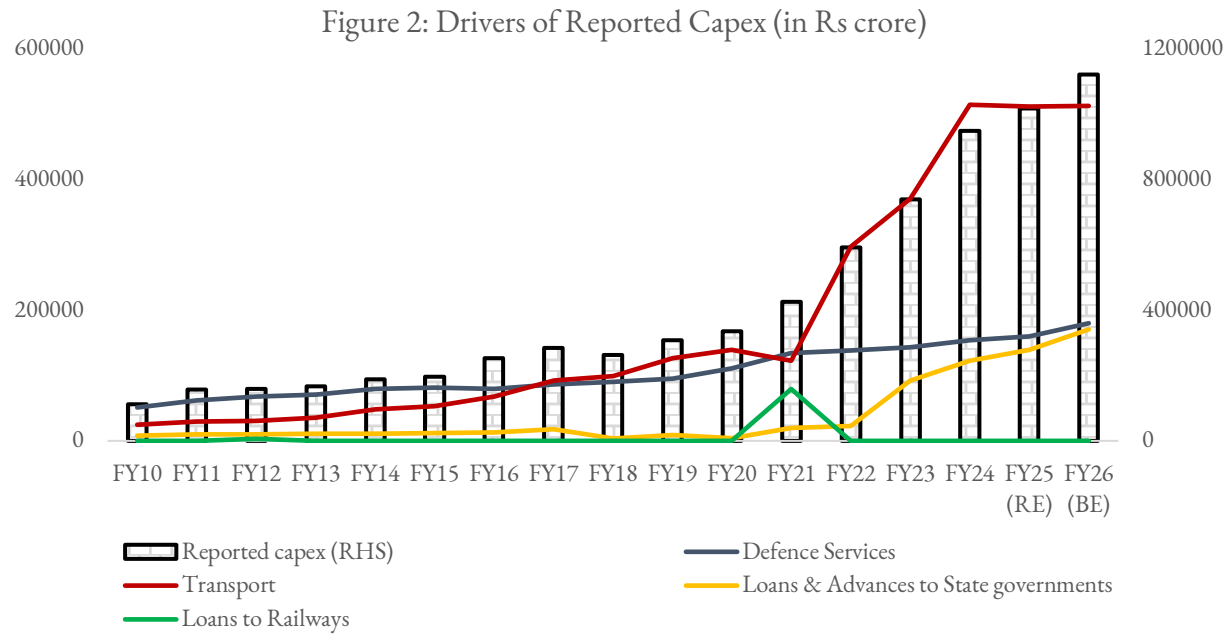
infrastructure. These investments address critical infrastructure gaps and stimulate private sector participation by improving logistics, connectivity, and efficiency.

Key Trends

Among the key trends:

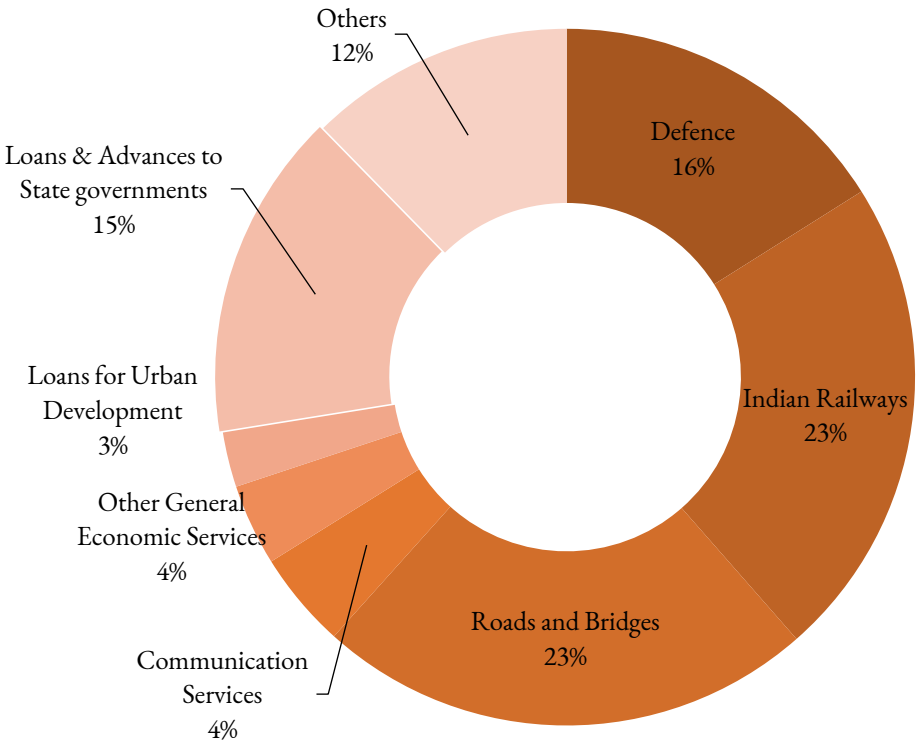
- Figure 2 presents the key reported components that drive central government capex growth since FY10.
- Figure 3 provides the sectoral distribution of the Centre's capex for FY26, showing that as much as 75% of the Centre's capital spending is on building road infrastructure, railways, defence, and communications. The remaining one-fourth comprises mainly loans and advances, the nature of which we discuss below.

Figure 2: Composition of Reported Capex (in Rs crore)



Source: Union Budgets

Figure 3: Sectoral Distribution of Capex in FY26 (Budgeted Expenditure (BE))



Source: Union Budgets

Rise of Loans and Advances to States

A significant trend in recent budgets has been the rise in loans and advances to state governments, recently driven by the Scheme for Special Assistance to States for Capital Investment, launched in 2022. These loans, often interest-free, aim to incentivise state-level infrastructure investments. However, their effectiveness and timing in tangible asset creation at the state level remains uncertain due to variations in states' fiscal capacities, implementation capabilities, and the diversion of funds for other purposes, such as loan repayment.

Among recent trends:

- FY25 Budget Allocation: The central government allocated Rs 11 lakh crore for capex, about 3.4% of GDP, an 11% increase from the previous year. Of this amount, Rs 1.6 lakh crore was designated for interest-free loans to state governments, representing 15% of the total allocation.
- FY26 Projections: The allocation has remained at Rs 11 lakh crore, with Rs 1.7 lakh crore earmarked for loans and advances to states, accounting for approximately 15% of the total capex.

As with loans to state governments, a significant portion of Centre's capex also comprises financial assets, such as loans and equity infusions to public sector enterprises (PSEs), which do not directly

contribute to physical asset creation, thereby overstating capex spending. Questions, therefore, remain about its classification.

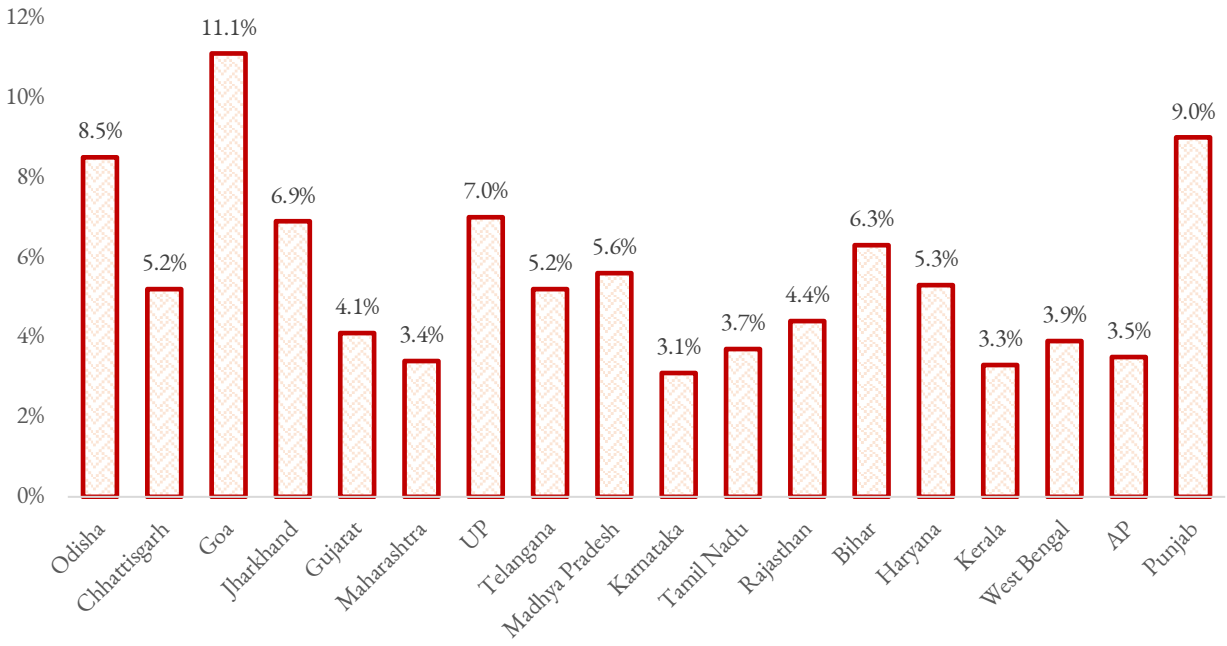
2.2. State Governments' Capex

State governments are major contributors to India's overall capex, reportedly accounting for 3-4% of GDP (Figure 4).

Their spending priorities include local infrastructure, social welfare programs (for, e.g., education and healthcare) and power sector investments. However, substantial variations exist across states in fiscal discipline, governance quality, and administrative capacity, leading to disparities in states' capex efficiency and effectiveness, capacities and developmental priorities. As discussed later, significant and varying data gaps across states complicate the transparency of the reporting of their tangible asset creation.

In this context, Niti Aayog's (2025) Fiscal Health Index (FHI) of Indian states in FY23 ranks them on major indices like quality of expenditure, revenue mobilisation, fiscal prudence, and debt indicators[2]. The graph below showcases the states ranked in ascending order based on their performance on FHI. One of the determinants of this is the capital outlay to GSDP ratio, which measures how much of a state's resources are reportedly leveraged for long-term investments. Among all states, Odisha is ranked the highest in overall fiscal health, with a higher percentage of its economic resources utilised for capital projects. As can be seen, the capital spending of higher-ranked states[3] is on the higher end, Goa and Jharkhand being the prime examples.

Figure 4: Capex of State Governments as % of GSDP in FY24



Source: Handbook of Statistics on Indian States, RBI

Note: Data for Goa and Gujarat is for FY23.

Key Trends in FY24

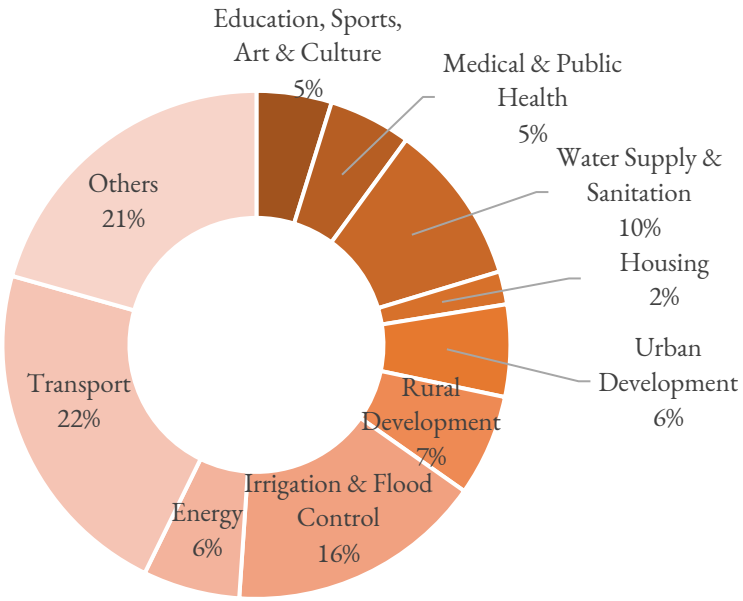
- States' combined budgeted capex was Rs 14 lakh crore, of which just over one-half was directed toward actual capital outlays through tangible asset creation. The remaining 42% was allocated to debt repayment.
- The share of loans and debt repayment in total reported capex varies widely across states, ranging from 20% to 85%. This underscores the differences in states' fiscal strategies, transparency, and debt profiles.

Regional Variations

- **High-Spending States:** Odisha and Punjab emerged as leading states in reported capex spending as % of their GSDP amounting to over 8%. Investments were focused on transport, rural infrastructure, and social development.
- **Low-Spending States:** Gujarat reported one of the lowest capex levels relative to GSDP at 4%, reflecting its relative fiscal conservatism and probable reliance on private investments and public-private partnerships (PPPs) for infrastructure development.
- **Smaller and Hilly States:** States like Manipur and Arunachal Pradesh allocated over 15% of their GSDP to capex, driven by central transfers and loans and high infrastructure needs.

Sectoral Priorities

Figure 5: Breakdown of states' combined capital outlay in FY24 (BE)



Source: State Finances: A Study of Budgets, RBI

Figure 5 illustrates the breakdown of states' combined capital outlays[4] for FY24, emphasising transportation, irrigation, water supply, and sanitation. Together, these sectors accounted for nearly half the total budgeted capital outlay. The 'others' component includes expenditure on family welfare, industry and minerals, tourism, and general services. Social infrastructure, including health and education, received relatively lower allocations, presumably reflecting the challenges of balancing developmental priorities with fiscal constraints.

2.3. Challenges in Reported Capex

As explained above, a significant portion of reported capex represents grants or support to other entities, including loans and debt repayment, unlinked to capital outlay and development priorities. As a result, the reporting of capex faces several challenges in transparency and accountability, such as accounting misclassifications, exclusion of off-budget and contingent liabilities, and diversion of capex funds.

These practices contradict official rules and definitions of capex in India, such as the Government Accounting Rules (GAR) 1990 and the General Financial Rules (GFR) 2017, where:

- Capex is defined as expenditure incurred to acquire "tangible" or "concrete" assets of a "permanent nature" or "enhancing the utility of existing assets" (Rule 84 of GFR, Rule 30 of GAR).
- GAR explicitly clarifies that spending on a temporary asset must not be classified as capital spending.
- GFR 2017 requires that a register of fixed assets must be maintained in a prescribed format (Rule 209 (i)), and physical verifications must be conducted annually (Rule 213(1)).

India's current reporting practices are also similarly at odds with internationally set standards and global best practices. They, therefore, are in urgent need of improved transparency and alignment with global standards.

By addressing these issues, India can better focus on real capital investment and effectively achieve its developmental goals. This discussion sets the stage for the next section to examine international standards and their relevance for improving India's capex reporting practices.

3. International Reporting Standards

International codes and guidelines, such as the GFSM 2014 and the Fiscal Transparency Code 2019 (the Code) of the IMF, as well as the World Bank's Debtor Reporting System (DRS) Manual 2000 provide guidelines and global standards[6] for reporting public finance data, including capital spending. These frameworks aim to ensure consistency, transparency, and comparability across countries. Table 1 highlights key principles from the GFSM 2014 and the Code, which serve as benchmarks for India's reporting practices.

Table 1: Global Standards for Capital Spending Reporting

Principle	International Standard
Accrual-Based Accounting	Governments are encouraged to adopt accrual-based accounting systems to ensure expenses[7] are recorded when they occur rather than when cash transactions happen. This includes recognising non-monetary transactions, depreciation, and valuation of intangible assets. (Para 1.27, GFSM 2014, Principle 1.3.1, the Code).
Consistent Reporting	Capital spending should be clearly distinguished from revenue expenditure[8], ensuring that only expenditures resulting in nonfinancial asset creation are classified as capital spending. (Principle 1.3.1, 3.3.2, the Code; Para 4.25, 7.17, 8.3, Table 8.1, GFSM 2014)
Comprehensive Reporting	Governments must report extra-budgetary spending, contingent liabilities and public sector entities, including those by Special Purpose Vehicles (SPVs) and Public-Private Partnerships (PPPs), to capture fiscal risks and obligations. (Para 1.80, 2.80, 4.15, GFSM 2014; Principle 3.2.1, 3.3.2, 3.2.4, the Code)
Timely and Consolidated Reporting	Frequent and timely publication of fiscal data ensures public scrutiny and data-driven policymaking. Consistent subnational reporting and consolidation of general government and public sector finances are required for a unified view of public spending. (Principle 1.2, 2.2.2, 3.3.1, 3.3.2, 1.4.3, the Code; Para 3.156, GFSM 2014).
Granularity	Governments must provide detailed breakdowns of capital spending, including revenue and expenditure projection, sector-wise allocation, asset types, and project-specific cost-benefit analyses. This is particularly crucial for multi-year projects to track long-term financial commitments. (Principle 2.1.3, 2.1.4, the Code)
Debt-Financed Spending Transparency	Disclosure is required for the economic classification of long-term external debt, including debt-financed projects and their economic sectors, along with associated debt service costs, to ensure transparency in government borrowing and fiscal sustainability. (Form 1, Item 7, 16-21, DRS)
Outcome and Impact Reporting	Public spending must be linked to measurable outcomes, such as infrastructure quality, service delivery improvements and economic impact. Governments should publish regular progress reports on capital projects (Principle 2.3, the Code)

3.1. International Experience

A growing number of emerging and advanced economies have adopted practices aligned with the GFSM standards, offering valuable insights for India to enhance its capex reporting systems. Among these, China, Brazil, and Canada have completely shifted to accrual accounting.

1. **China:** China has made significant achievements in implementing GFSM 2014 reporting standards, including quarterly general government data dissemination, public debt management, and timely financial soundness indicators under the G20 Data Gaps Initiative (DGI-2). In contrast, India partially fulfils these criteria and could benefit from enhanced policy alignment, debt reporting, and local accountability mechanisms.

2. **Brazil:** Brazil has leveraged IT systems and incentives for the timely sharing of fiscal data at the subnational level to produce consolidated general government data (Blagrave & Gonguet 2020). Brazil emphasises detailed sectoral reporting of capex, focusing on infrastructure and social investments. As mandated by the Fiscal Responsibility Law 2000, Brazil also publishes a Fiscal Risk Appendix along with the annual budget, which evaluates contingent liabilities (IMF 2018, 98). India can adopt Brazil's approach to detailed sectoral reporting, including contingent liabilities in fiscal documents, and mandate fiscal risk disclosures in budget documents.

3. **South Africa:** South Africa's fiscal framework includes sector-wise capex tracking and reporting, linking expenditures to socioeconomic outcomes such as improved healthcare and education. The National Treasury publishes seven-year economic and fiscal outlooks, including three forward years (IMF 2018, 83). India should focus on outcome-based reporting, linking capex to measurable impacts, and developing systems to track the effectiveness of investments in achieving developmental goals.

4. **Canada:** Canada employs accrual-based accounting with rigorous project-level tracking and ensures public accessibility to fiscal data. The country has a robust monitoring system where each federal department has set up an evaluation unit (IMF 2018, 79). Additionally, Canada caps the guarantees issued to third parties to be judicious with public resources. India could adopt accrual-based accounting and more responsible capex reporting while developing detailed project-level tracking and public access mechanisms.

5. **Chile:** Chile focuses on comprehensive project-level reporting, offering granular details and emphasising sustainability in capex planning. The budget includes a medium-term financial projection of the investment projects financed through the budget and PPPs. A detailed summary of the following three years is provided with an ex-ante cost-benefit analysis. Additionally, an ex-post analysis is done for completed projects (IMF 2018, 67). India can improve the granularity of its capex reporting by providing project-specific details.

3.2. India's Performance vis-a-vis International Standards

These international practices highlight actionable steps for India to align with GFS standards, enhance transparency, and optimise capex reporting for better fiscal management and developmental outcomes.

The IMF has placed India behind most G20 economies in fiscal transparency and reporting. India is also one of the few G20 countries which does not provide disaggregated general government fiscal data[9] as per GFS standards. This is despite India's G20 DGI commitment to produce quarterly general government GFS data by 2021 (Blagrave & Gonguet 2020). A step in this direction has been the development of cash-based GFS-aligned data for the central government by the Controller General of Accounts (CGA) since FY21[10], but subnational reporting remains inconsistent. Thus, (partially) comparable GFS data are available only for the central government.

India's fiscal reporting diverges significantly from GFS standards due to its adherence to cash-based accounting[11] under the GAR 1990. The key points of divergence are:

1. **Cash-based accounting:** India continues to adhere to cash-based accounting under GAR 1990. As India does not follow accrual-based public sector accounting, it does not track and report receivables and payables. The recording and reporting of assets and liabilities are also limited.

2. **Lack of nonfinancial asset reporting:** India does not publish data on the fixed asset registries prescribed by GFR 2017, which record the purchase or creation of new fixed assets by type of assets. Despite guidelines from the Ministry of Finance (MoF) and CGA regarding the development of e-asset registers, implementation remains incomplete.

3. Inclusion of financial assets in reported capital spending: India's reported capex includes financial assets such as loans, advances, and equity infusions, which may not directly result in physical asset creation. For instance, interest-free loans provided by the Centre to states for capex are counted as capex, regardless of their end-use.

4. Lack of consumption of fixed capital accounting: As India does not follow accrual accounting, it does not measure and record the consumption of fixed capital. Thus, net investment in capital assets is overestimated due to the non-recording of consumption of fixed capital.

5. Exclusion of Off-Budget: Significant portions of capex by PSEs[12] are excluded from budgetary reports, obscuring the true extent of public investment. Many large government projects are carried out by PSEs, which often use off-budget borrowings. Therefore, their inclusion at the time when the capex is incurred is crucial to understanding the true extent

Due to these divergences, India's estimation of capital spending includes financial assets as well– estimates of capital spending vary considerably. As per the CGA's GFSM data, the Union's actual capital spending, i.e. net investment in non-financial assets[13] is lower than its budgetary gross estimates. Table 2 presents estimates for FY21- FY23.

Table 2: Estimates of Union Capital Spending as per GFS Manual 2014 compared with Union Budgets (in Rs. crores)

	FY21	FY22	FY23
Capex as per Union Budgets	426,317	554,236	750,246
Net Investment in Nonfinancial Assets (Capital Spending) as per GFSM 2014	217,852	239,408	251,216

Further, if India were to move to accrual accounting and calculate the consumption of fixed capital, capital spending, i.e. net investment in nonfinancial assets, would be much lower. As we show in Section IV, the estimates as per GFSM 2014 are closer to our adjusted estimates of the Centre's capital spending.

A similar exercise by the IMF to calculate adjusted fiscal deficit estimates by taking into account off-budget financing showed that the central government's fiscal deficit was greater than the budget's 'headline' figures (Blagrave & Gonguet 2020). An important adjustment to headline estimates was the inclusion of the borrowing requirements of PSEs. In a similar stride, the following section adjusts the Centre's capital spending estimates to approximately align with GFSM 2014 and disaggregates adjusted public sector capital spending into government spending and PSE spending. This approximately aligns with the methodology adopted by other experts (Gupta & Ladha 2025).

Nevertheless, the preparation and availability of the central government's GFSM fiscal data by CGA, as per India's G20 DGI strategy, is a move towards improved reporting and transparency. However, the data gaps discussed in Section V reflect areas where India needs to do more.

4. Adjusted Capital Spending

As highlighted in the previous section, the calculation of capital spending must be limited to the acquisition of nonfinancial assets to align with international standards. Primarily, two types of transactions contribute to this misalignment:

(i) Loans and Advances to other entities, including repayment of debt

- Central Government: The Centre includes loans and advances to state governments and government employees in its calculation of capex. For instance, the Centre has, in recent years, provided 50-year interest-free loans to the state for capex. However, this expenditure should be recorded as capital spending by the state governments when these loans are utilised by states to create non-financial assets and not by the Centre.
- State Governments: State governments report capex from the Consolidated Fund, which includes:
  - Loans and advances extended to other entities, including State PSEs (SPSE) and local bodies.

- Repayment of loans received from the Centre or market borrowings.

Loan repayments do not lead to the creation of new public assets and should, therefore, be excluded from the calculation of adjusted capital spending.

(ii) Budgetary support to Public Sector Enterprises (PSEs)

The Union and state governments also report equity infusion and loans to PSEs as capex. These financial transactions, collectively termed budgetary support to PSUs, do not necessarily translate into infrastructure creation or physical assets.

These must be excluded from reported capex to estimate adjusted capital spending.

This methodology enables us to:

1. Differentiate between actual capital spending and financial asset creation,
2. Distinguish the capital spending of PSEs from that of the government, hence avoiding double-counting,
3. Ensure that capex aligns with international standards by focusing on physical asset creation.

4.1. Capital Spending of CPSEs

PSEs finance their capex through:

1. Budgetary support from the government through loans and equity infusions,

2. Funds generated internally or raised through external resources such as extra-budgetary resources (IEBR).

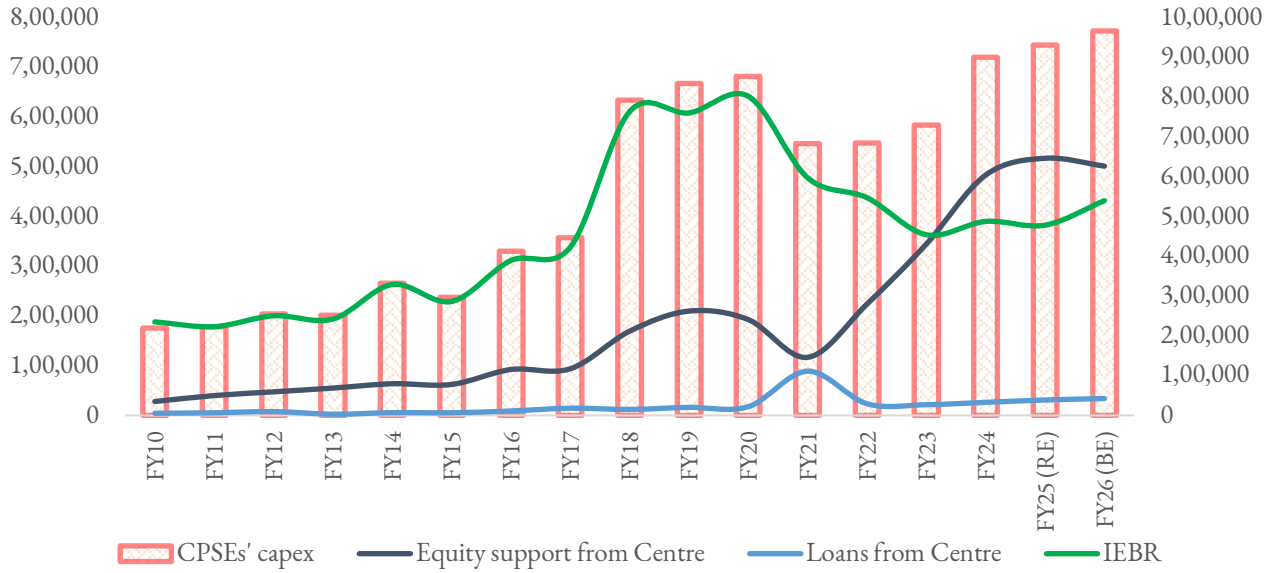
As per Statements 25 (Resources of Public Enterprises), 26 (Investment in Public Enterprises) and 1 (Summary of Expenditure) of the Union Budget, the summation of loans, equity and IEBRs represents the reported capital outlay of CPSEs.

Key Trends in CPSEs' Capital Spending:

- There has been an increase in budgetary equity infusions, corresponding with a slight decline in IEBRs in recent years. This has resulted in a nominal net increase in the capital outlay of CPSEs.
- As budgetary support to PSEs in the form of loans and equity is included in the reported capital spending of the central government, the increase in equity infusion has inflated the Centre's reported capex. This budgetary support, if it translates to non-financial asset creation, should be included in CPSEs' capex during the period when it does.
- The corresponding decline in IEBRs is not reflected in the Centre's reported estimates. This raise concerns that the increase in the Centre's reported capital spending driven by increased equity support is not fully incremental.

- The CAG and other analysts have noted a trend in allocating budgetary support to loss-making PSEs, raising concerns about the sustainability and efficiency of such expenditures (CAG 2024a).

Figure 6: Capital Outlay of CPSEs (in Rs. crore)



Source: Union Budgets

Equity infusion, loans, and IEBR translate into actual capital spending for PSEs if they are used to create tangible and durable assets. However, there are significant discrepancies between:

1. What the Centre and state governments report as capital outlay of PSEs, and
2. What the PSEs themselves report as capex in their finance accounts.

Box 1 describes the issue of discrepancies and the need for reconciliation of budgetary capital outlay and actual capital spending of PSEs.

Box 1: Reconciliation of reported budgetary support with actual capital spending of PSEs

The Department of Public Enterprises (DPE), through its financial monitoring dashboard, publishes actual capital spending data reported directly by CPSEs since FY21. The table below shows that actual CPSE capital spending is consistently lower than the capital outlay reported in the Union budgets, suggesting that:

- A portion of budgetary allocations (equity infusions and loans) or IEBRs are not being utilised for asset creation.
- Reported capex is overstated compared to actual physical investments.

Capital Spending of CPSEs – Reported v/s Actual (in Rs crore)

		FY21	FY22	FY23	FY24	FY25
Reported	Total Capital Spending as per Union Budgets	683,233	684,847	729,184	840,468	913,670
Actual	Total Capital Spending as per DPE Dashboard	502, 696	575,634	645,920	741,883	776,691
Actual as % of reported		73.6	84.1	88.8	88.3	85

Similar discrepancies exist for state PSEs. CAG audits (2024b) have highlighted discrepancies in financial records between state finance accounts and state PSE balance sheets.

For instance:

- In Punjab, CAG found that the state government reported an equity infusion of Rs 19,000 crore into 16 PSEs in FY23, but the PSEs' financial records accounted for Rs 23,000 crore (ibid, 54).
- This discrepancy raises concerns about accountability and the need for timely reconciliation of financial records.

Thus, CAG recommended the required time-bound reconciliation of accounts to address these discrepancies and close the gap.

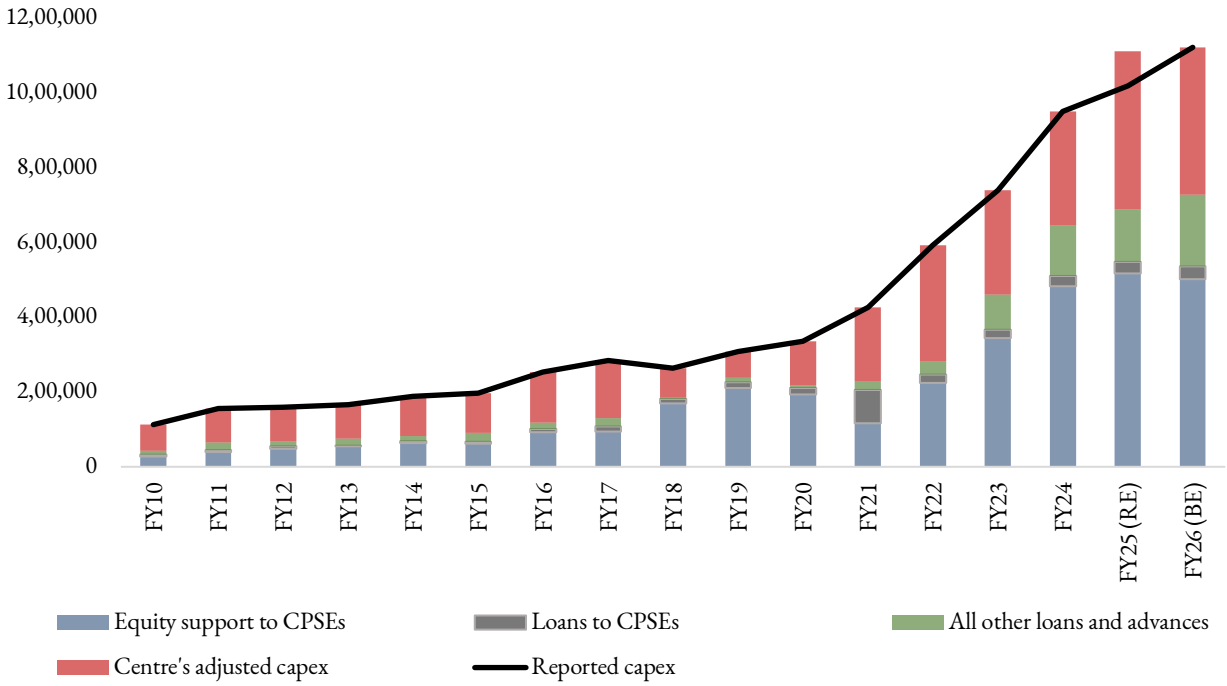
4.2. Centre's Adjusted Capex

By excluding budgetary support to PSEs and loans/ advances, we can estimate the Centre's actual capital spending (or capital outlay), which we term adjusted capital spending.

Figures 7 and 8 highlight:

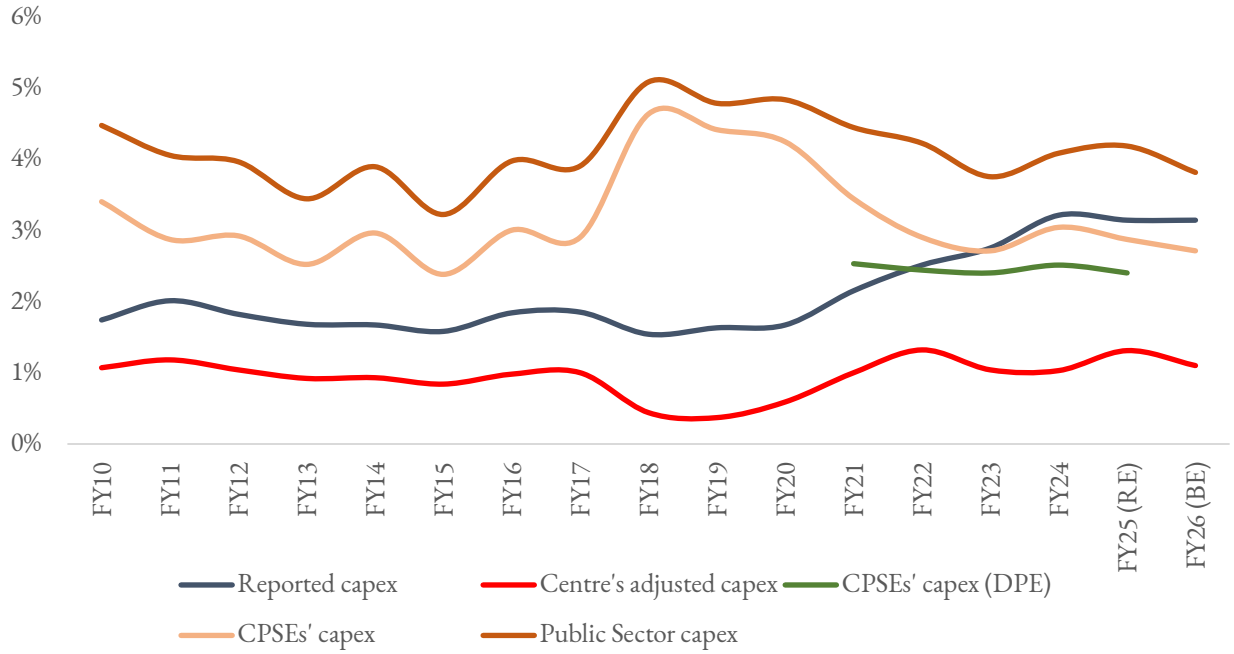
- In recent years, reported capital spending has been inflated by equity infusion to CPSEs and loans to state governments. For instance, in FY26, 45% of reported capex is budgeted for equity support to CPSEs, and 15% for loans to state governments.
- When financial assets (loans and equity) are excluded, adjusted capex as a percentage of GDP does not show the increasing trend in reported capex.
- In particular, for FY25 and FY26, adjusted central government capex is far lower than reported estimates. While capex is reported to be 3.14% of GDP in both FY25 and FY26, adjusted capex is estimated to be 1.1-1.3 % of GDP.

Figure 7: Centre's Reported v/s Adjusted Capital Spending



Source: Union Budgets

Figure 8: Centre's Public Sector Adjusted v/s Reported Capex as % of GDP



Source: Union Budgets; DPE Dashboard

Note: 1. Indian Railways and National Highways Authority of India are included in CPSEs' capital spending. 2. Public Sector Capital Spending includes CPSEs' data as per Union Budgets and the Centre's adjusted capital spending.

- The Centre's adjusted capital spending as a percentage of GDP shows a decreasing trend in recent years, contrary to the trend of reported spending.
- CPSEs' capital spending, as given in the Union Budgets, has also decreased. Total public sector capital spending, thus, has fallen from its peak in FY18.
- CPSEs' capital spending, as per DPE data, is lower than Union Budget estimates, further reducing total public sector capital spending as % of GDP.

4.3. States' Adjusted Capex

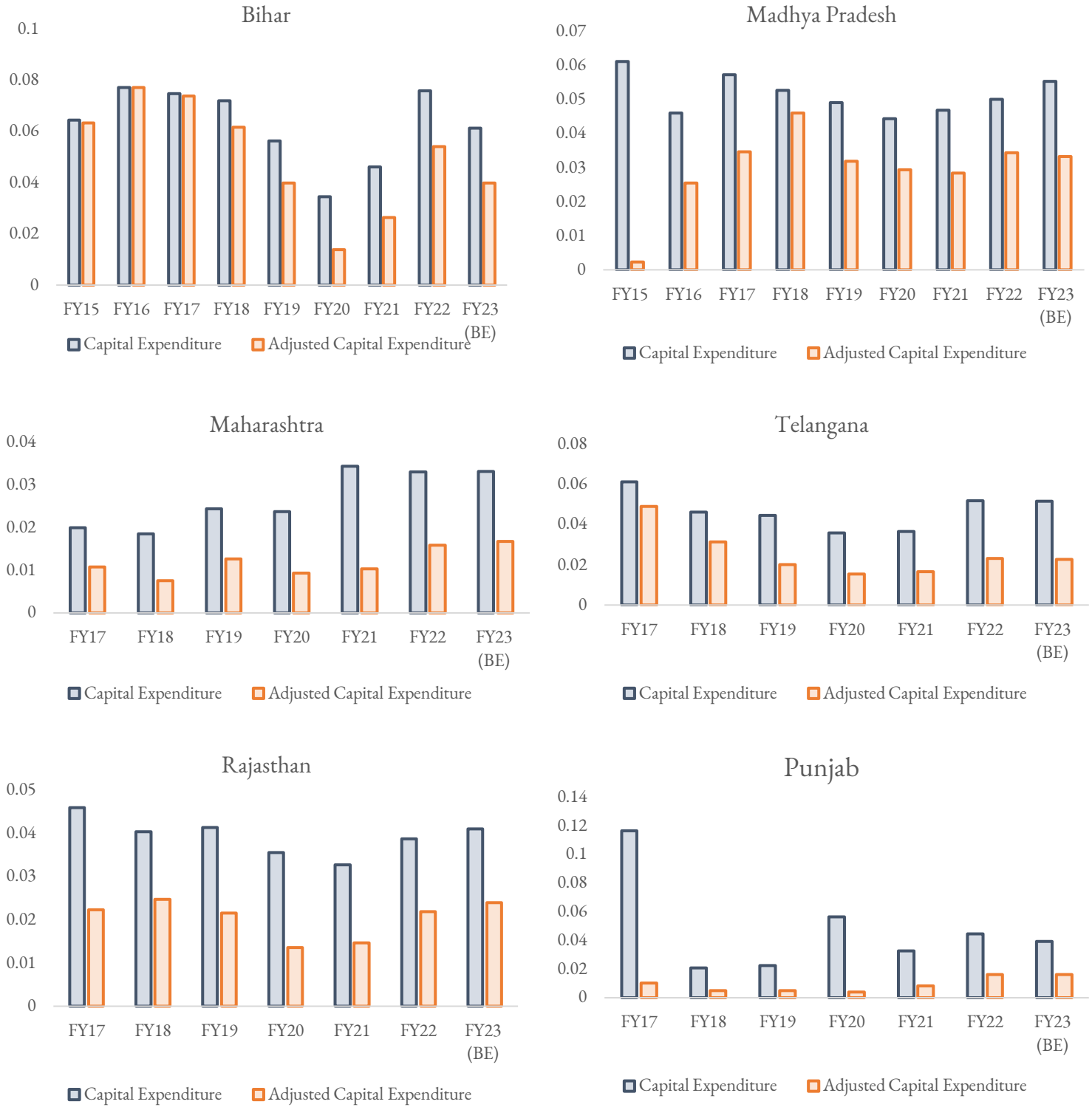
Using a similar methodology, the reported and adjusted capex of six states is presented in the figure below. To arrive at the adjusted capex:

- **Exclusion of Financial Assets:** Loans to other entities, including state PSEs (SPSEs) and other states, and the discharge of internal debt were deducted from the reported capex.
- **Exclusion of Equity Investments:** Equity investments by states in their SPSEs were excluded to provide a more accurate estimate of actual capex.
- **Correction of Misclassification:** The adjusted capex also accounts for "misclassification"—the erroneous accounting of revenue expenditure as capex. This issue has persisted across states and years, and addressing it helps derive more accurate estimates.

The adjusted estimates could only be calculated for states where details of SPSE equity infusions were provided to the CAG. Blagrave & Gonguet (2020) have also noted the absence of comprehensive

and compiled data on SPSEs. As such, this analysis could not be extended to other states. The incompleteness of the data is discussed later in the paper.

Figure 9: States' Reported v/s Adjusted Capital Spending as % of GSDP



Source: State Finances: A Study of Budgets, RBI; Handbook of Statistics on Indian States, RBI; CAG State Finance Audit Reports

A significant portion of this equity infusion is directed toward state power companies. For instance, Bihar State Power Holding Company Limited accounted for nearly 90% of the state's capital infusions over the years. Similarly, in Punjab, most of the allocation went to the State Power Corporation.

Key Trends

- State budgets systematically overstate capital spending by including financial assets (loans, equity infusions, and debt repayments). Hence, adjusted capex provides a more accurate picture of the public investments of states.
- It should, however, be noted that the adjusted numbers might be overstated as data for misclassifications is not consistently available across all states and all years.
- For example, Bihar's FY23 adjusted capex was 4% compared to the reported 6% of the state GDP, with a similar difference in previous years.
- In the case of Madhya Pradesh, in FY15, the reported capex was over 6% of the state GSDP. However, after removing the component of loans and PSE equity, the adjusted capex remained merely 0.23%. In FY23, the reported capex was above 5.5%, almost half of which comprised loans and PSE equity.
- A similar trend can be seen for the other states in Figure 9.
- Better reconciliation and transparency in reporting are needed to ensure fiscal accuracy and efficiency.

5. Data Gaps in Capex

Aside from the issues in the calculation of capex, the CAG has consistently highlighted other inefficiencies, mismanagement, and systemic weaknesses in India's capex reporting, including misclassification of expenditures, underreported liabilities, and reliance on off-budget borrowings that evade public scrutiny. These issues are particularly pronounced at the state level, where differences in fiscal capacity, governance quality, and financial reporting standards result in an uneven capex landscape. These data gaps undermine the accuracy, efficiency, and credibility of India's public investment framework, with significant consequences for fiscal policy and developmental planning.

The key data gaps can be classified into the following dimensions:

5.1. Inconsistencies in Reporting

A significant data gap exists in the misclassification of expenditures, with some states (and occasionally the Centre) reporting revenue expenditures as capex. Among the states:

- **Andhra Pradesh:** The state has frequently included revenue expenses, such as contributions to minor works and grants-in-aid, inflating its reported capex. For instance, in FY23, Andhra Pradesh misclassified more than Rs 700 crore in revenue expenses as capex, primarily in grants

for irrigation. This misclassification misrepresents its actual capital investment and distorts the state's fiscal deficit (CAG 2024c, 106).

- **Madhya Pradesh:** The state often reports grants, routine maintenance expenses and salary payments linked to capital projects as capex. In FY23, the state misclassified Rs 2382 crore worth of revenue expenditure as capital spending, including Rs 256 crore in grants-in-aid (CAG 2024d). This misclassification artificially inflates capital spending figures and deflates revenue spending and the deficit.

GAR establishes clear guidelines for classifying maintenance and working expenses as capital spending before the project has been open for service and for further additions and improvements. Once the project has been opened, all subsequent maintenance charges should be accounted for as revenue expenditure (Rule 31 (2)).

Additionally, GAR prescribes that grants-in-aid provided to local bodies or other institutions to create capital assets must be considered capital spending of the grantee. Thus, the grant-giving State must not account for this in its capital spending (Rule 30 (1)). Irrespective of its purpose, all grant-in-aid must be recorded as revenue expenditure in the grantor's books, as per Indian Government Accounting Standards (IGAS)-2 (CAG 2015a, 123). The Centre includes grants-in-aid for the creation of capital assets (for example, its spending on the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA) and the Smart Cities Mission) to its reported capital expenditure to calculate the 'effective capital expenditure'.

Other states have similarly exhibited misreporting trends:

- **Maharashtra:** The state has been found to classify grants to local bodies and PSEs as capex, irrespective of whether the funds are used for asset creation. In FY23, grants-in-aid worth Rs 3,440 crore were misreported as capital spending (CAG 2024e). This practice distorts the state's fiscal position and undermines the credibility of its financial reporting.
- **Rajasthan:** The state has also included grants and transfers to local bodies under capital spending, even when these funds are used for operational purposes. In FY23, grants worth Rs 330 crore were misreported as capital spending (CAG 2024f, 104). Reconciliation and verification of accounts can prevent such errors.

5.2. Incompleteness of Data

5.2.1. Off-Budget Borrowings and Hidden Liabilities

Off-budget borrowings through state-owned enterprises (SOEs), PSEs, and SPVs are substantial but often underreported or undisclosed in India's government accounts. These borrowings, often routinely used to finance capital projects, frequently fall outside the reported official budget and public debt data, creating hidden fiscal vulnerabilities and adversely affecting long-term sustainability.

For instance, **Maharashtra** State Road Development Corporation Limited (MSRDCL) financed Rs 20,400 crore in FY24 through extra-budgetary means (DoE 2024), but these borrowings were excluded from state budgetary accounts. This creates fiscal opacity and complicates the assessment of actual public debt and capital spending, making fiscal sustainability harder to evaluate. Additionally, contingent liabilities like guarantees for loans to state entities are only partially disclosed, further obscuring the true financial health position and underreporting capex.

The Fifteenth Finance Commission (FFC) recommended that states must not resort to off-budget or any other non-transparent source of finance to meet developmental expenditure (FFC 2020, 376). The CAG has also raised concerns about the use of off-budget borrowings to finance capex. In its reports on state finances, the CAG has noted that several states rely on off-budget financing for capital projects, but the nature of these liabilities is often unclear. This practice distorts fiscal deficit figures, as liabilities are not fully reflected in the budget. Off-budget measures also mask India's actual fiscal deficit and borrowing requirements, as highlighted by Blagrave & Gonguet (2020).

Among other states:

- **Kerala:** The state had outstanding off-budget borrowings to the tune of Rs 29,476 crore by the end of FY23, with 60% raised through the Kerala Infrastructure Investment Fund Board (KIIFB) (CAG 2024g, 64). The funds borrowed by it were not disclosed in the state's fiscal accounts. KIIFB is a statutory body of the Kerala Government that undertakes critical infrastructure development projects. The KIIFB has no revenue source of its own, and its loans are direct liabilities of the state government (ibid, 65). Therefore, this financing of capital spending does not appear in the state's budget, obscuring the true debt burden of the State.
- **Punjab:** Several PSEs rely on off-budget borrowings through SOEs and SPVs for financing. The Punjab Infrastructure Development Company and the Great Mohali Development Authority, among others, use extra-budgetary resources for rural electrification and irrigation (DoE 2024). These have inflated reported capex without adequately disclosing the contingent liabilities.
- **Tamil Nadu:** The state also relies on PSEs for funding power and rural housing infrastructure projects, with limited disclosure of associated liabilities (Gupta & James 2023).
- **Telangana:** The state's reliance on off-budget borrowing, especially for irrigation and water supply, has been significant. In FY22, Telangana disclosed Rs 30,000 crore for the Kaleshwaram Irrigation Project (DoE 2024). The state's Water Supply Corporation and Water Supply Resources Infrastructure Development Corporation frequently borrow to finance projects. All of which were not reflected in the state's formal fiscal accounts.

Often, off-budget expenditure forms a significant part of a state's total expenditure. However, it could not be included in the adjusted capex of states due to

1. The unavailability of year-wise data across states and years, and
2. Lack of clarity regarding whether the off-budget spending is revenue or capital expenditure

5.2.2. PPPs and Private Sector Contributions

Capital investments in India often involve PPPs, but data on these projects are poorly reported and not systematically collected by the government. Key information on the financial structure, government guarantees, and private sector contributions is often incomplete or unavailable. This lack of transparency obscures the true scale of capital investment and associated risks, particularly when government guarantees or contingent liabilities are involved, leading to underestimation of public sector involvement and fiscal exposure.

The CAG has highlighted gaps in transparency and financial accountability in PPP projects, where hidden liabilities for the government are often not reported in budget documents, particularly contingent liabilities arising from government guarantees or commitments in the event of project failure. In its audits of several PPP projects, especially in sectors like highways (CAG 2014a), ports (CAG 2015b) and airports (CAG 2013), the CAG raised concerns about inadequate risk-sharing between the government and private entities, with some financial obligations not properly disclosed and unfavourable to the government. The lack of transparency in PPP projects can create fiscal risks that remain hidden in public accounts, potentially burdening future public finances and limiting the government's financial flexibility.

- **Rajasthan**: The state's PPP Cell reported to the CAG the number and value of the projects completed, ongoing and planned as of FY23. However, CAG's audit showed that PPP details were unavailable in the State's budget documents, including revenue projections for both the private and the public sector (CAG 2024f, 48). The lack of transparency in PPP projects can create fiscal risks that remain hidden in public accounts, potentially burdening future public finances and limiting the government's financial flexibility. For example, the state's highway projects were financed through PPPs, but the associated liabilities were not disclosed in the state's fiscal accounts.

5.3. Fragmented & Untimely Reporting

5.3.1. Delayed Reporting of State-Level Data

Many Indian states delay reporting financial data, especially capex, and sometimes fail to report expenditures across sectors or projects, resulting in fragmented and inconsistent data. Retrospective and inconsistent reporting hampers accurate assessments of public investment, affecting national fiscal planning and real-time monitoring. While central government data is usually timely, state-level data can be delayed, incomplete, or non-standardised, reducing transparency. As a result, consolidated fiscal data prepared by the RBI is also retrospective and lacks granularity.

5.3.2. Fragmented Reporting Systems

India publishes separate fiscal data for the central and state governments scattered across innumerable reports and statements. The RBI provides consolidated data on government spending,

but it is often retrospective and lacks the detail and timeliness needed for regular GFS-compliant reporting. India's financial reporting and budgeting systems, particularly at the state level, rely on outdated and poorly integrated mechanisms, leading to fragmented data. Inconsistencies across ministries and departments at both the central and state levels complicate tracking and comparing capex, creating gaps in fiscal data and hindering policymaking. Significant variability exists in the categorisation and detail in states' capex reporting. This complicates cross-state comparisons, undermines consistency, and limits the ability to address regional disparities. The lack of a uniform accounting framework impedes data consolidation.

5.4. Lack of Granular Data

5.4.1. Project-Level Capital Spending

Capex is often reported in aggregate terms, lacking the granularity to assess spending on specific projects. Both central and state governments do not consistently provide detailed data on large projects, including cost breakdowns, timelines, and progress. This absence of project-level data makes it difficult for policymakers, auditors, and the public to monitor project progress and cost-effectiveness or hold agencies accountable for cost overruns and delays. While Appendix IX of the state finance accounts provides the status of incomplete capital projects, the level of detail falls short of GFSM standards. The CAG has also noted that Appendix IX may not be complete for all states and years (CAG 2024a, 51).

Some best practices at the state level establish benchmarks for transparency and accountability through consistent capital spending reporting. Known for its robust fiscal reporting and project transparency, **Tamil Nadu** develops public dashboards for ongoing projects to improve visibility into project progress, implementing agency, mode of implementation, budgets, and timelines (Tamil Nadu Infrastructure Development Board, n.d.).

A related issue is the lack of strong Public Investment Management (PIM) practices, a critical component of PFM reforms. The CAG has observed that many projects proceed without thorough feasibility assessments, resulting in mid-project design changes and resource misallocation. Such incomplete projects block funds due to inordinate delays and deprive the citizens of project benefits for extended periods. This further leads to additional debt and interest-servicing burdens (CAG 2024a, 51). In its many reports on irrigation and infrastructure projects, the CAG found that numerous initiatives lacked detailed project reports, cost-benefit analyses, or environmental impact assessments, creating significant implementation challenges. For example, Andhra Pradesh did not disclose the financial results of any irrigation projects, as a result of which the viability of the projects could not be assessed (CAG 2024c, 53). Insufficient feasibility studies have also led to abandoned or incomplete projects.

In the absence of data on the viability of capital projects, oversight and monitoring are also thwarted. The CAG has frequently found that capital projects are often approved based on overly

optimistic[14] revenue projections or inadequate financial prudence. For instance, in its audit of Indian Railways, CAG noted that projects were approved based on unrealistic financial projections, unjustifiable pricing and costing, and projected traffic and earnings were significantly overestimated (CAG 2014b). Thus, many infrastructure projects, including toll roads or utility projects, frequently fail to meet revenue targets, undermining their financial viability. When actual revenues fall short, the projects face financing gaps, resulting in debt accumulation or incomplete infrastructure.

5.4.2. Debt-Financed Capex

Both the Centre and states depend on borrowings to finance capex, yet data linking these borrowings to specific projects is often unavailable or not disaggregated. Borrowing data is typically amalgamated with overall debt figures, making it challenging to ascertain how much is utilised for productive asset creation. The World Bank has recommended public disclosure of all public debt at transaction level, with a level of granularity that permits stakeholder awareness, oversight and accountability. This is also imperative to ascertain if national assets, including physical infrastructure, have been used as collateral against the debt (Maslen & Aslan 2022). The Centre reports all long-term external debt to the World Bank, including the economic purpose of the debt (Form 1, DRS 2000)– this is published in the Statement 19 (Externally Aided Projects) of the Union Budgets. India does not perform the same exercise for internal debt. The absence of detailed borrowing data associated with capital projects obstructs evaluations of debt sustainability and the effective utilisation of borrowed funds for long-term infrastructure investment. While Indian states report government borrowings, the specific capital projects financed by these funds are frequently not identified. Furthermore, states often employ off-budget borrowings for capital projects without full disclosure, thereby failing to satisfy GFS transparency standards. These practices are in variance with internationally set global standards of debt disclosure, discussed in Table 4.

Among the states:

- **Telangana** reports substantial borrowing by state-owned entities to fund capital projects, contributing to notable urban and rural infrastructure development efforts (Gupta & James 2023). However, this data does not provide any information about the actual utilisation of these borrowings for specific projects.
- **Andhra Pradesh** relies heavily on financing from SOEs, which is not always transparent in the main budget documents (CAG 2023a, 61). The state could improve its capex reporting by detailing specific project liabilities.
- Known for significant industrial and infrastructure investments, **Gujarat** provides detailed capex data for key projects. However, the state could improve transparency in its off-budget expenditures, which are occasionally understated. Gujarat has introduced better tracking for state-level industrial and infrastructure projects with portals like online Project Management System or ePMS (Chand 2014) but lacks consistent reporting on debt-financed activities. Many other

Table 2: Disclosing government debt for improved transparency and accountability

Standard	Key Guideline	Applicability
IMF GFSM 2014	Requires reporting of gross and net debt and comprehensive disclosure of explicit and implicit contingent liabilities (Para 7.236 - 7.260).	Applied in IMF member countries as the basis for compiling and disseminating government finance statistics.
World Bank DRS 2000	Requires borrowing countries to provide detailed information about their long-term external debt, including publicly guaranteed private debt. Form 1 also requires a brief description of the economic usage of the loan (Item 7, Form 1).	Applied to countries receiving World Bank assistance.
OECD Best Practices on Budget Transparency 2002	Recommends disclosing debt levels in pre-budget, mid-year, year-end and monthly reports. Borrowings are suggested to be classified by their interest rate, maturity profile and debt management instrument, among others. (Para 1.2, 2.3)	Used as a guide in OECD member countries to improve budget transparency.
IPSAS	Suggests comprehensive disclosure of risks associated with financial instruments, including interest rate and currency risk (IPSAS 30). It also issues implementation guidelines with illustrative examples to guide the accounting of assets funded through borrowings (IPSAS 5).	Serve as generally accepted accounting principles to be adopted by the government sector across the world.
European Union Stability and Growth Pact (SGP)	Recommends reduction in public debt levels, alongside high-quality and green public investments to guide sustainable growth and fiscal consolidation.	Rules to ensure coordination of sound fiscal policies among European Union member states.
Public Expenditure and Financial Accountability (PEFA) Framework	Recommend debt management for a transparent PFM system. This includes recording and reporting of debt and guarantees, approval of debt and guarantees, and a strong debt management strategy.	Provides a measurement framework to over 125 countries, including IMF and European Commission members.

5.4.3. Output Data

India's budget documents focus primarily on allocations rather than output. The Centre's Outcomes Budget releases targets for outputs and outcomes for major government schemes but does not provide details of achievements vis-a-vis targets. While data on inputs and budget allocations are

recorded, there is a significant lack of output data to track actual results, such as improvements in infrastructure quality or public service delivery (e.g., roads built, hospitals constructed).

For example, while Rs 50,000 crores were allocated by the Centre to a loan guarantee scheme to support the setting up of private hospitals in non-metro areas in 2021, there has not been any utilisation of funds (Dutta 2022). Without publicly available data on output achievements, there is a disconnect between spending and infrastructure development, making it difficult to assess the effectiveness and value for money of capital investments.

The CAG has noted that many capital projects in India lack a clear focus on outputs or outcomes, which are integral for a robust PIM framework. In its audits of rural and urban infrastructure projects, the CAG found that, although funds were disbursed, the impact on local communities was not adequately assessed. Key metrics, such as access to public services, infrastructure quality, and economic outcomes, were often missing from evaluation frameworks. For example, Bharatmala Pariyojana, a program under the Ministry of Road Transport and Highways for national highway development, laid down some output measurement parameters in Phase I. However, no mechanism was laid for the measurement of these outputs. CAG audits also found that other important output parameters, like accident reduction, user satisfaction, etc., were missing (CAG 2023b, 13). Without a focus on outputs, assessing the effectiveness of capex becomes challenging, potentially leading to inefficient resource use, substandard infrastructure, and wasted public funds.

5.5. Underutilisation of Allocated Spending

5.5.1. Utilisation and Disbursement Gaps

A recurring issue highlighted in the CAG's reports is the underutilisation of budgeted capex. There is often a significant gap between budgeted capex and actual disbursement at the central and state levels. Despite substantial allocations for capital projects, actual spending frequently falls short due to delays in procurement, procedural bottlenecks, and project management issues. For instance, in FY24, the central government's revised capex estimate was Rs 50,000 crore lower than budgeted. The Ministry of Railways allocated Rs 1.2 lakh crore for infrastructure in 2022, but only 70% was utilised due to procurement delays.

The CAG has noted that funds earmarked for infrastructure projects remain unused, particularly at the state level. For example, Pradhan Mantri Jan Vikas Karyakram, a centrally sponsored scheme under the Ministry of Minority Affairs, builds infrastructure units/projects and basic amenities in certain targeted areas. More than 58,000 projects meant to be completed by 2019 were shelved, and funds amounting to nearly Rs 4,500 crore remain unutilised. States have also been unable to provide utilisation certificates for the expenditure incurred (Mishra 2023). Such underutilisation of allocated funds compromises infrastructure development. The gap between allocations and actual spending is frequently not transparent, leading to a misleading picture of investment levels.

5.5.2. Inefficiencies in the Use of Central Transfers to States

The Centre often transfers funds to states for capital projects as loans, grants, or through centrally sponsored schemes. As observed above, in the FY26 budget, Rs 1.7 lakh crore has been allocated as interest-free loans to states out of the Rs 11 lakh crore earmarked for capex. However, states sometimes fail to fully utilise these funds within the prescribed period, resulting in unspent balances. Data on the use and remaining unspent amounts of central transfers are also often inadequately reported. This underutilisation delays capital projects, hindering infrastructure development in key areas such as health, education, and rural development, while the lack of transparency prevents effective oversight.

The CAG has observed that many states lack the administrative and technical capacity to plan, execute, and monitor large-scale capital projects. This results in project delays, poor execution quality, and underutilisation of capital budgets. In several reports on state capex, the CAG highlighted that states consistently underutilise funds for projects such as rural roads, irrigation systems, and public buildings due to a shortage of trained personnel, poor project management practices, and inefficient procurement systems.

Among the states, **Uttar Pradesh** often struggles to utilise funds allocated by the Centre for centrally sponsored schemes and its budget provisions. Of the Rs 79,000 crore transferred to the State Nodal Agency by the Centre (51%) and the State (49%) for the implementation of CSS by the end of FY23, Rs 29,000 crore remained unspent, possibly due to delays in procurement and project approvals. Despite budgeting over Rs 100 crore for certain schemes, no spending was incurred on at least 22 schemes in FY23. For example, Rs 400 crore was provided in the FY23 budget for the construction of a Court Campus and another Rs 200 crore for developing school infrastructure. Both these provisions were unutilised in FY23 (CAG 2024a). This indicates procedural lapses, insufficient prudence in the budgeting process or poor project management. The State's inability to utilise available funds delays project implementation and also reduces public trust in the government's ability to deliver on its promises.

5.6. Mismanagement of Funds

Finally, India is lagging in effective oversight and monitoring of capex projects. Many projects fail to implement mechanisms to track progress, ensure timely completion, and manage finances, leading to delays, cost overruns, and poor execution. For instance, in its reports on railway projects, the CAG identified weak internal controls and poor oversight as key factors behind delays and budget overruns in new rail line construction. Issues such as inadequate inter-departmental coordination and contractor management were also highlighted (CAG 2024h). The current practice of annual allocations is not suited for multi-year capital projects, leading to incomplete projects due to non-allocation of funds mid-way.

The CAG has consistently pointed out cost overruns and delays in major infrastructure projects, often attributed to poor planning, delayed approvals, and weak project management. This issue recurs in CAG audits of capex across sectors such as power, irrigation, highways, and public works. In its

report on highway projects, the CAG highlighted significant delays that increased costs, driven by land acquisition challenges, contractor inefficiencies, and inadequate oversight. For example, the financial indiscipline shot the cost of per kilometre construction of Dwarka Expressway between Delhi and Gurugram to Rs 257 crore as against the approved per km cost of Rs 18 crore (CAG 2023b, 27). These delays and cost overruns elevate project expenses, reduce the economic return on investments, and increase the fiscal burden on the government.

Among states, Bihar consistently reports delays in implementing infrastructure projects, particularly in sectors like health, education, and housing. For instance, the Patna Smart Cities Mission faced delayed and incomplete project execution primarily due to fund diversions (Press Trust of India, n.d.). The state's reporting systems are outdated, leading to inconsistencies in tracking capital spending across departments. The CAG has also frequently identified obvious cases of fund mismanagement, where capital project allocations were redirected to meet short-term revenue expenditures, a problem particularly common at the state level.

6. Looking Ahead: Agenda for Transparency Reforms

As per the Open Budgets Survey 2023[15], India's budget transparency score is 51 out of 100, reflecting insufficient publication of budget material to support public debate. The country's public participation score is low at 6 out of 100, placing India behind most neighbours[16]. Additionally, India's budget oversight score is 61 out of 100, indicating limited legislative oversight but adequate audit oversight (International Budget Participation 2024).

The data gaps identified above explain India's sub-par performance on international indices of budget and fiscal transparency. Issues such as misclassifications by multiple agencies, aggregate reporting that obscures project-level details, and a focus on input-based data rather than measurable outcomes continue to undermine the accuracy and efficiency of India's fiscal management. For instance, the lack of granular data on projects under flagship schemes like Bharatmala Pariyojana makes it difficult to assess their progress and impact. Fiscal transparency requires more than just the availability of more data; it also needs user-friendly and accurate information which is suitable to understand by non-specialists. Further, these must be standardised across states and the central government to ensure equal access to all citizens (Blagrave & Gonguet 2020). Strengthening transparency is, therefore, not just about compliance—it is crucial to ensuring the efficient allocation of public funds, fostering accountability, and building public trust. Hence, India's evolving capex reporting framework requires comprehensive reforms to align with global best practices and address systemic inefficiencies.

The following agenda outlines a roadmap to enhance transparency in capex reporting:

I. Standardise classification and definitions

- **Establish and enforce a consistent definition of capex** across all government levels. This definition must clearly distinguish between capital and revenue expenditures and investments

in financial and non-financial assets, ensuring that only spending on tangible, long-term non-financial assets is classified as capex. For example, the UK's Capital Spending Framework separates financial and non-financial assets, ensuring transparency (HM Treasury 2024).

- **Adopt a unified and standardised accounting and reporting framework** for capex, which separates financial and non-financial assets across all government levels. This can be done by following international public financial management standards, such as those set by GFSM and IPSAS. Many comparable countries have successfully transitioned to accrual accounting, improving fiscal transparency.
- **Adopt automated tools** for expenditure classification and implement training programs for government officials to standardise practices. Countries are expanding their use of AI in public financial management and find that this has significantly reduced errors and improved efficiency.

II. Enhance the budgetary process and reporting

- **Prepare financial reports at the general government level** to eliminate inter-government/inter-entity transfers and reveal net investment in nonfinancial capital assets.
- In the Union and state budgets, provide **detailed breakdowns of capex** by sector, department, and project. The CGA's Chart of Accounts can be reviewed to reflect program/project-based reporting. Including information on the allocated budget and actual spending will help track project progress and ensure funds are used as intended. For example, Australia's Mid-Year Economic and Fiscal Outlook provides ongoing accountability through detailed mid-year reviews.
- In this regard, **publishing data from e-assets registers can be a first step.** Government Accounting Standards Advisory Board (GASAB) [17] has recommended the introduction of an annual statement in the finance accounts regarding 'Capital Expenditure for the acquisition of Fixed Assets' (CGA 2019).
- **Publish mid-year and end-year reports on capex,** highlighting deviations from budgeted figures. This would help identify variances and provide an ongoing assessment of how funds are utilised.
- **Include a dedicated capex supplement** in budget documents, highlighting all ongoing and new projects, including timelines, funding sources, and expected outcomes.

III. Improve project-level and outcome-based tracking

- **Implement a centralised digital Public Financial Management System (PFMS) system** and a National Fiscal Dashboard to report real-time project-level capex data across all ministries and states. This system should track funds allocated, disbursed, and spent, alongside real-time

project updates and outcomes. Brazil's Transparency Portal is a successful example of real-time fiscal data dissemination (Gracida and Rivero Del Paso 2019).

- **Implement international best practices in Public Investment Management (PIM),** ensuring social cost-benefit analyses are conducted for major/mega projects, construction and maintenance costs over multi-years are budgeted for, and implementation mechanisms, outputs and outcomes are defined.
- **Regularly require progress reports** for all capex projects, with physical and financial progress updates. This reporting should include milestones achieved, challenges faced, and adjustments made to project plans or budgets.
- **Use geotagging and digital monitoring tools** to provide verifiable evidence of infrastructure projects' progress. This approach has been successfully used in other countries to ensure that reported expenditures correspond to project completion and quality. MGNREGA has also employed geotagging to track progress.
- **Strengthen outcome-based reporting** by developing standardised metrics for linking expenditures to measurable benefits, such as infrastructure quality, public access, and economic benefits. Ex-ante and ex-post evaluations can then be conducted to assess the effectiveness and value for money of projects, and future budgetary allocations can be tied to the demonstrated outcomes of past projects.

IV. Increase audit coverage and depth

- **Strengthen the role of the CAG** by increasing the frequency and depth of audits on capex projects, focusing on high-value projects and sectors with significant public impact. Regular audits by the CAG can also enforce stricter adherence to classification norms and mitigate this issue.
- **Strengthen internal monitoring** and review processes by upgrading internal audit/review mechanisms within ministries/departments.
- **Conduct independent performance audits** that assess the efficiency, effectiveness, and economy of capex projects. These audits should look at whether projects achieve intended outcomes and whether they are implemented within budget and timelines. Among other countries, South Africa's performance audits have been instrumental in improving public service delivery (Auditor General, South Africa 2023, 56).
- **Establish independent oversight committees** to monitor high-value projects with a focus on their efficiency, effectiveness, and outcomes.
- **Publish summary reports of audit findings in accessible formats** to ensure that citizens are informed about how capital funds are used and any issues found in project implementation.

V. Increase public access and participation

- **Create an online user-friendly portal for public access to real-time capex data**, including project-level details, timelines, and updates. The portal should integrate data from all ministries, states and PSEs. Kenya's Open Data Initiative is a successful example of improving citizen engagement (Centre for Public Impact 2016).
- **Consult stakeholders** such as civil society organisations, think tanks, and communities in monitoring capex. Public consultations and citizen-led audits can help improve grassroots accountability and ensure that capital projects align with local needs and priorities.
- **Consider implementing participatory budgeting mechanisms,** where citizens have a say in deciding capex priorities, particularly at the local and state levels. This can ensure that capital investments reflect public demand and enhance trust in government spending. Porto Alegre, Brazil, is a global pioneer in participatory budgeting (World Bank 2008, 12), which has increased citizen representation in the budgeting process.

VI. Strengthen data quality and accuracy

- **Implement data validation checks** within government departments to ensure the accuracy of reported capex. This may include automated checks, internal audits, and cross-verification with other datasets.
- Encourage all departments and states to **use standardised data collection methods** for capex reporting. This will facilitate better aggregation and comparison of data, improving overall data quality.
- **Invest in data aggregation tools** that allow for the seamless consolidation of capex data across departments and states, ensuring that reported figures reflect actual spending accurately and consistently.
- **Provide training and technical assistance** to government officials for accurate classification and monitoring of spending data. Singapore's Civil Service College offers a model for capacity development (Civil Service College, n.d.).

VII. Link fiscal transfers to transparency and accountability

- Link **fiscal transfers from the central government to states' adherence to transparency,** reporting norms and accountability in capex reporting. States that meet high standards in data disclosure and reporting could receive additional funding.
- **Create incentives for states and ministries to adopt best practices** in capex reporting. This could include recognition programs, additional grants, or other rewards for entities that excel in transparency and accountability. Open Government Awards, an initiative of Open

Government Partnership, promotes transparency, accountability, and civil engagement (Open Government Partnership 2021).

VIII. Align with international standards

- India can improve transparency by **aligning its accounting practices with IPSAS,** which promotes accrual accounting for improved governance and accounting quality. GASAB has developed the Indian Government Financial Reporting Standards (IGFRS) for public sector accrual accounting with IPSAS's guidance to facilitate pilots and research on India's transition from cash accounting. Indonesia's adoption of IPSAS has significantly improved fiscal transparency (The Association of Chartered Certified Accountants 2017, 11).
- **Regularly benchmark India's capex reporting practices against global best practices** to identify areas for improvement. This could involve adopting elements from countries with advanced public expenditure frameworks, such as Australia, Germany or Canada.

IX. Promote transparency in off-budget expenditures

- **Ensure that any off-budget expenditures and government liabilities** related to capital projects by PPP projects, PSEs, and SOEs **are mandatorily disclosed** and integrated with government finance accounts and budget documents. This transparency will provide a more comprehensive view of the government's capex commitments.
- **Report contingent liabilities** associated with capital projects (e.g., government guarantees for loans taken by PSEs) to give a clearer picture of the potential financial risks and obligations. South Africa's inclusion of contingent liabilities in budget documents is a best practice (Rodriguez et al., 2024).

By adopting these strategies, India can significantly enhance transparency in capex reporting, thereby improving accountability, fostering public trust, and ensuring that resources are allocated efficiently. These improvements will help India align with international best practices in public financial management, ultimately leading to more effective use of public funds for long-term development goals.

7. Conclusion

India's journey toward a transparent, efficient, and outcome-driven capital spending framework is both a challenge and an opportunity. India's capex landscape is a critical component of its developmental strategy, with a focus on fostering economic growth, bridging infrastructure deficits, and promoting equitable regional development. The government's focus on flagship programs like Bharatmala Pariyojana and Sagarmala reflects a strong commitment to infrastructure-led growth. However, translating these ambitions into outcomes requires addressing systemic inefficiencies. Thus, while progress has been made in increasing budgetary allocations and implementing major

infrastructure projects, significant challenges remain in reporting, transparency, and the effective utilisation of funds.

Persistent Challenges in India's Capex

India has, in recent years, made strides toward improving the transparency and reporting of capex, especially at the central level. However, India's current reporting system and management of these expenditures suffer from significant gaps and inconsistencies. The CAG's assessments of India's capex reveal marked challenges in the planning, execution, and monitoring of capital projects at both the central and state levels. Additionally, the country still falls short of complete compliance with international standards in several areas. The key issues highlighted include underutilisation of funds, project delays, cost overruns, mismanagement of resources, and lack of transparency, particularly in off-budget expenditures and PPPs. These data gaps not only restrict data-driven policymaking but also impede our ability to track capital spending outcomes and hold implementing agencies accountable.

State practices in managing capital spending also vary widely, reflecting differences in fiscal discipline, administrative capacity, and governance priorities. Punjab's reliance on off-budget mechanisms, Kerala's use of the KIIFB, and Tamil Nadu's welfare-driven expenditures highlight the diverse challenges across states. These variations underscore the need for a standardised reporting framework that aligns with global standards like the GFS and the IPSAS.

The Need for Comprehensive Reforms

Despite incremental improvements in fiscal transparency, India still falls short of full compliance with global reporting standards.

To address these challenges, India must prioritise the following:

- Transitioning to accrual-based accounting to align with international PFM standards.
- Enhancing project-level transparency through PFMS, geotagging, and real-time fiscal dashboards.
- Mandating disclosure of off-budget borrowings and ensuring comprehensive reporting of liabilities.
- Establishing performance-linked fiscal incentives to encourage state-level compliance with global best practices.
- Conducting an IMF Fiscal Transparency Evaluation (FTE) to benchmark India's reporting against global standards.
- Leveraging technology, institutional reforms and digital innovations like Direct Benefit Transfers (DBTs), which have already saved Rs 348,500 crore by March 2023.

A robust capex framework must ensure regional equity by channelling investments to underserved areas, integrate environmental sustainability into infrastructure planning, and strengthen governance mechanisms to enhance PPPs.

By bridging data gaps, enforcing international reporting standards, and leveraging technology, India can transition towards a more transparent and accountable capex framework.

India's Long-Term Fiscal Vision

India's economic growth ambitions depend on its ability to sustain high levels of public investment while maintaining fiscal prudence and transparency. Achieving this vision will require a collaborative effort between the central and state governments, the private sector, and civil society. With a robust capex framework in place, within a comprehensive fiscal framework that promotes data-driven policy decisions, India can meet its infrastructure needs and lay the foundation for sustainable and inclusive growth.

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Notes

[1] The paper does not focus on capital expenditure by the third tier of governments, which is still relatively small, but the transparency reforms discussed in this paper are equally important at every tier.

[2] However, as discussed later below, much depends on the clarity of the measures and their comparability across states (Rao 2025).

[3] An exception to this is Punjab, as the FHI uses data for FY23.

[4] Capital outlay is capex net of discharge of internal debt, repayment of loans to the Centre, loans and advances by the state governments and inter-state settlement.

[5] 48% on average for states and 65% on average for the Union in FY24.

[6] In addition to GFSM 2014 and the Code, IPSAS is another important global accounting standard which lays out guidelines for both cash-based and accrual accounting for public sector entities. These have been developed in alignment with the International Accounting Standards Board's (IASB) International Financial Reporting Standards (IFRS) by adapting them to the context of the public sector.

[7] Accrual-based accounting records expenses, i.e. costs incurred irrespective of whether they are paid for in cash, and not expenditures. Cash-based accounting records expenditures, i.e. cash payments made for expenses.

[8] In accrual-based accounting, this is termed expenses, i.e. transactions which do not affect assets or liabilities.

[9] As per GFSM 2014, the general government includes the central, state, and local governments and social security funds. GFSM data is, therefore, disaggregated at all levels of the general government. It also provides a consolidated estimate of fiscal metrics for the general government.

[10] This is available on CGA's website under "Accounts".

[11] As per the International Federation of Accountants' International Public Sector Financial Accountability Index 2018, India is among 46 countries which follow the cash basis of accounting (International Federation of Accountants 2018).

[12] As per GFSM 2014, decentralized agencies, especially those which majorly rely on government financial support, or directly under government control, or are non-market producers (i.e. do not price output at market prices), can be considered extra-budgetary units, and therefore, part of the general government.

[13] CGA has been releasing a Statement detailing quarterly budgetary revenue, expenditure and operating balance for the central government in line with the G20 Data Gaps Initiative-2 recommendation number 15 which follows GFSM guidelines, since FY21. IMF recommends this to be done on the accrual-basis of accounting. However, CGA provides this data on the cash-basis. Additionally, CGA's cash-based GFSM data does not measure consumption of fixed capital. Hence, net and gross investment in nonfinancial assets is equal.

[14] Principle 2.1.2 of the Fiscal Transparency Code discusses the "optimism bias" faced by countries in their macroeconomic and fiscal forecasts.

[15] The 2023 Survey assessed the FY22 budgets of 125 countries.

[16] Nepal (31), Pakistan (15) and Bangladesh (11).

[17] GASAB formulates and recommends IGAS under the CAG.

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IPPR

Strengthening the Rule of Law: Role of the Finance Commission

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Abstract

This paper examines an essential yet underexplored aspect of judicial reform in India – the budgeting process and the allocation of funds to the judiciary. By analysing the budgetary allocation towards the judiciary at both the union and state government level, this paper reveals both a vertical disparity (between the union and state governments) and horizontal disparities (across the states) in budgetary allocation towards the judiciary in India. The paper utilises several metrics (pending cases per lakh population, judicial expenditure per capita, expenditure per subordinate court, case burden per subordinate court, etc.) to understand the disparity of public funding of judiciary from various dimensions. The paper also highlights archaic budgeting processes and severe underutilisation of funds, and underscores the role of the Finance Commission in addressing funding disparities and improving budgetary practices. The paper proposes reform measures to the Sixteenth Finance Commission to improve the budgeting for the judiciary, allocation of money to courts, and the utilisation of funds.

Keywords: Budgetary allocation to judiciary, Budgetary practices, Funding disparities, Finance Commission, Judicial reforms, Rule of Law

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1. Introduction

In any democratic nation-state today, the judiciary is an important wing of the government. In India, the judiciary is considered by many citizens as the last hope in their pursuit of justice. The judiciary in India has the power to examine the validity / constitutionality of the legislations passed by the legislative, and has sometimes examined policies of the executive that might have been construed as unconstitutional. Therefore, the judiciary is the ultimate custodian of rule of law in India.

The judiciary in India faces problems like outdated and archaic processes, large percentage of judicial vacancies, lack of technological integration, etc., and there have been several studies on the same (DAKSH 2016, 3-24) (Khaitan, Seetharam and Chandrashekaran 2017, 14-20). A major aspect that most of the studies miss is the role of the budgeting process and public funding towards the judiciary. Several studies (e.g. Viapiana 2018, 11-12) tell us that the budgeting system can have an impact on judges' autonomy, which shows the important role that judicial budgeting has on rule of law.

Several reports have highlighted the low budgetary allocation made to the judiciary by the executive in India (India Justice Report 2023). According to the estimates in this paper, the judiciary is allocated only 0.14% of GDP of India. This is much lower than global standards: a majority of the countries in the European Union spend around 0.31% of GDP on the judiciary (Council of Europe 2024). The lack of budgetary allocation and ineffective utilisation of resources leads to inadequate infrastructure and technological improvements, insufficient human resources and other problems that lead to increased pendency of cases. This ultimately affects access to justice, and weakens public trust in the judiciary.

The importance of an efficient judiciary has also been highlighted by economists as imperative for a nation's economic growth. From economic studies that have studied the link between legal institutions and economic growth (North 1990, 100-104) (Voigt, Gutmann, and Feld 2015, 14-15), to reports by the OECD and various governments, there has been a lot of emphasis placed on the importance of improving judiciary for boosting the economy of a country.

The Economic Survey of India for 2017-18 (Ministry of Finance 2017-18, 131) highlighted the fact that an efficient judiciary enables contract enforcement, which in turn improves the ease of doing business in a country. Economists like Arvind Panagariya have identified judicial reforms, like the introduction of National Company Law Tribunals, that have improved the insolvency framework, which bodes well for the industrial and service sector in the longer run (Panagariya 2008, 297-298).

In the above context, this paper[1] aims at understanding one of the aspects of the judiciary which requires a deeper analysis for formulation of steps for judicial reforms – the budgeting process and budgetary allocation to the judiciary – and the role of the Finance Commission (FC) in reducing the disparity in public funding towards the judiciary across the states. This paper examines issues in budget formulation, allocation, and utilisation. In the last section, we suggest where the Finance

Commission can intervene to enhance the budgeting and resource allocation process, in addition to improving technological and scientific infrastructure, as a means to improve the capacity of the judiciary.

2. Review of Budgetary Allocation to the Judiciary in India

2.1 Examining Major Challenges in the Indian Judiciary

2.1.1 Rise in Backlog of Pending Cases post COVID-19

According to the data from the National Judicial Data Grid (NJDG), as of October 2024, 4.48 crore cases are pending in the subordinate courts, 60.35 lakh cases are pending in the high courts and 66,103 cases are pending in the Supreme Court, adding up to 5.09 crore cases in total. The COVID-19 pandemic led to disruption in operations of the courts, resulting in the number of cases in the judiciary to cross the 5-crore figure mark.

According to the NJDG, five states- Uttar Pradesh (1.14 crore cases), Maharashtra (53.1 lakh cases), Bihar (35.97 lakh cases), West Bengal (32.2 lakh cases), and Karnataka (20.54 lakh cases) account for 57.51% of the pending cases.

2.1.2 Shortage of judges and court staff

Large vacancies for the posts of judges, along with a lack of court halls and court staff, have always been major issues in the Indian judiciary. Increasing the number of judges, setting up more courts, and simplification of procedures are often recommended as a major solution to the problem of huge case pendency in India (Rao 2024, 28).

Nearly 21.1% of the judges' post lie vacant (See table 1) according to the data stated by the Ministry of Law and Justice in the Lok Sabha (2025). The Supreme Court has two vacancies (which is 5.88% vacancy). In the high courts, it is higher at 33.2%; in the subordinate courts it is 20.6%.

Table 1 Vacant Positions of Judges/Judicial Officers at Various tiers (2025)

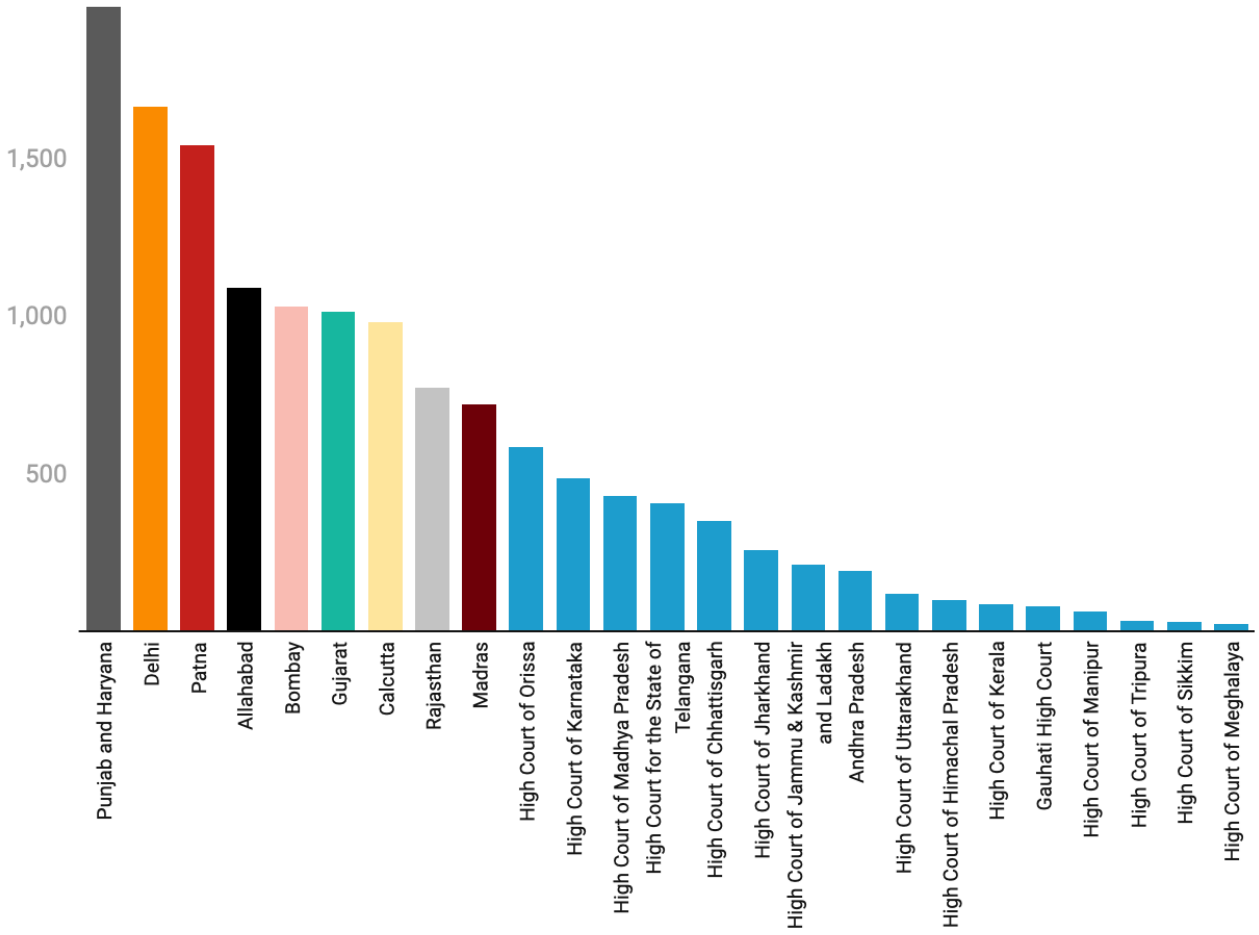
Courts	Sanctioned	In Position	Vacancies	Vacancy %
Supreme Court	34	32	2	5.9
High Court	1114	751	370	33.2
Subordinate Courts	25786	20466	5320	20.6
Total	26934	21249	5692	21.1

Source: Authors' calculation based on data from Rajya Sabha Unstarred Question No. 1073 answered on 13.02.25.

What most analyses of the Indian judicial system overlook are vacancies in non-judicial staff. The non-judicial staff manage the day-to-day administration of the court, including the movement of case files, and assist the advocates and the judges in conducting judicial process and hearings.

If we consider the data from the 'State of the Judiciary' report by the Centre for Research and Planning, Supreme Court of India, 27.23% of the sanctioned posts of court staff are vacant. As against a total sanctioned strength of 2,73,696 for staff, employees, and officials in subordinate courts, only 1,99,172 (less than 75%) were filled in 2023 (Centre for Research and Planning 2023, 119-120). When we look at the high courts (see figure 1), as against a total sanctioned strength of 53,124 court staff, the working strength was only 38,927, a vacancy of 26.7%.

Figure 1 Vacancies of non-judicial court staff in various High Courts (2023)



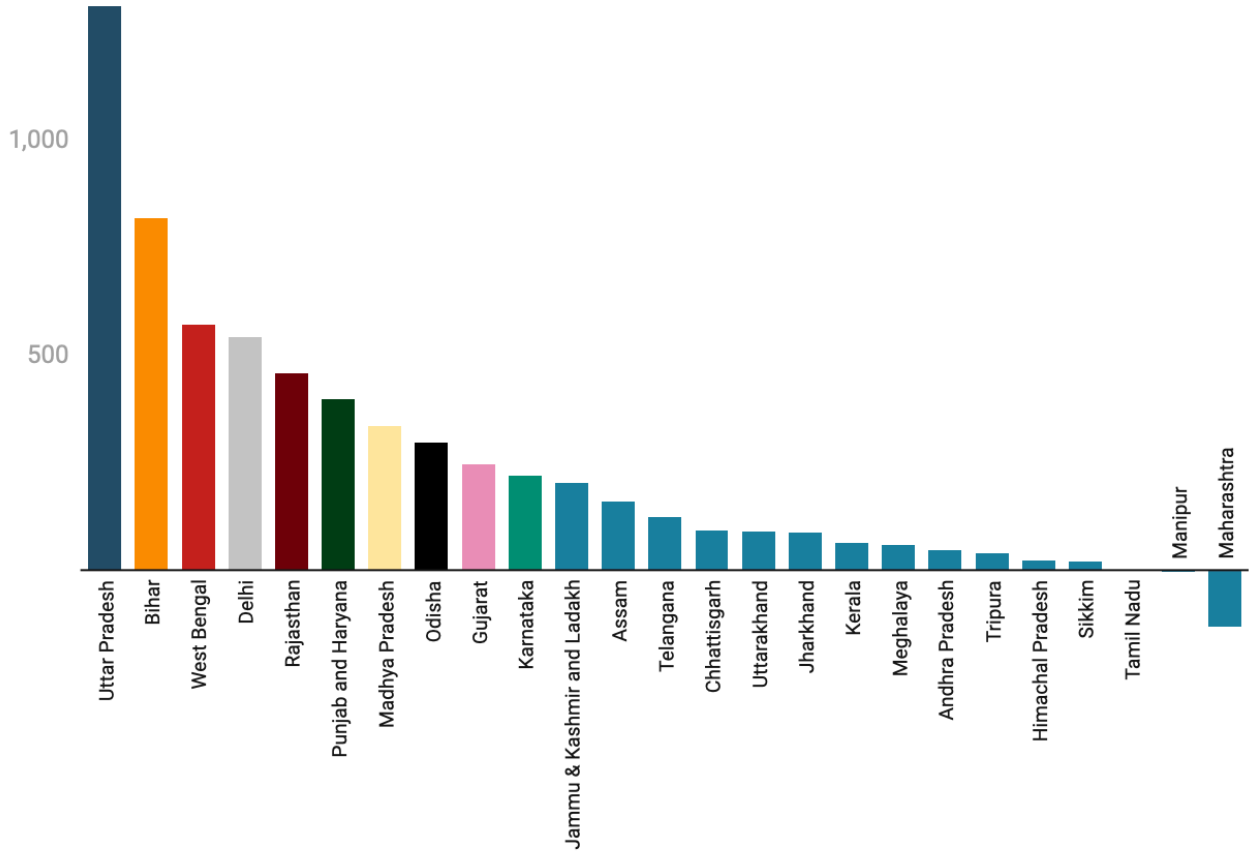
Source of data: Indian Judiciary- Annual Report 2023-24, Volume 2- High Courts (Supreme Court of India)

2.1.3 Shortfall in Physical Infrastructure

As per the 'State of the Indian Judiciary Report 2023' (Centre for Research and Planning 2023, 119), there are not enough courtrooms for judicial officers in the subordinate courts. As against a total sanctioned strength of 25,081 judges/judicial officers, only 21,811 court rooms were available in 2023 in the subordinate courts. This resulted in a significant shortage of 16.95% of court room infrastructure (Centre for Research and Planning 2023, 7).

In addition to the above issues, there is also a shortage of residential accommodation for judicial officers (see figure 2 for state-wise details). Only 19,001 judicial residences were available for the total sanctioned strength of 25,081 judicial officers, resulting in a shortfall of 24.24% (Centre for Research and Planning 2023, 16). The availability of residential accommodation can improve efficiency by reducing travel time and enabling prompt response to emergencies.

Figure 2 Infrastructure Gaps in Subordinate Courts (State-Wise) - Accommodation for Judicial Officers (2023)



Source of data: State of the Indian Judiciary Report, 2023 (Centre for Research and Planning, Supreme Court)

2.2 Expenditure on the Judiciary by the Union and State Governments: Key Trends

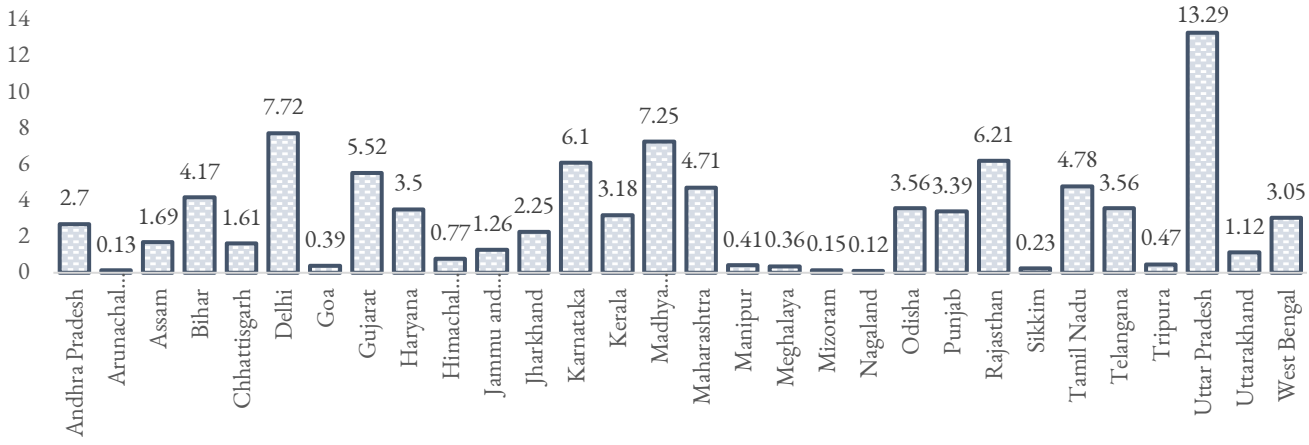
In this section, we examine trends and patterns in expenditure by the Union and the states using multiple metrics. For the states, we have analysed their per capita expenditure on the judiciary, expenditure per pending case, and expenditure per court. The importance accorded to the judiciary by each state is gauged by the budgetary allocation towards the judiciary as a percentage of the overall budget of that state.

According to our calculations, the combined expenditure on the judiciary by the Union and the state governments increased from 0.11% of GDP in 2019-20 to 0.14% of GDP in 2024-25. While this overall share remains low, in absolute terms, the expenditure on the judiciary by the Union and states taken together has increased by 81.27% from Rs. 21,888 crore in 2019-2020 to Rs. 40,126 crore in 2024-25. This sharp rise, when viewed alongside the modest increase in GDP share, reflects the low base of expenditure on the judiciary in 2019–20. These figures indicate that, despite significant growth in absolute budgetary allocation to the judiciary, India's expenditure remains below international standards, such as the 0.31% of GDP spent by European countries.

The union government's share in the All-India judicial budget has increased marginally over the last 5 years, largely due to initiatives like e-Courts phase 3, which is a project by Union government to improve integration of technology in the judiciary, and creating a fully digital, paperless, and citizen-centric judicial ecosystem. The e-Courts phase 3 has a financial outlay of Rs. 7,210 crore (Ministry of Law and Justice 2024).

In 2019-20, 95.82% of the All-India budget for the administration of justice was allocated by the states. In 2024-25, this percentage has reduced marginally, with the states spending 93.64% of the All-India budget for the judiciary, and the Union spending 6.36%. It is interesting to note that the Union Government's contribution to the All-India budget for the administration of justice is lower than the contributions of some individual states. For instance, Uttar Pradesh accounts for 13.29%, and Delhi contributes 7.72% to the All-India budget for the administration of justice (See figure 3). This highlights the significant role that states play in the overall funding of the justice administration system.

Figure 3 Percentage share of states in total expenditure on the judiciary by all states and the Union government (2024-25 B.E.)

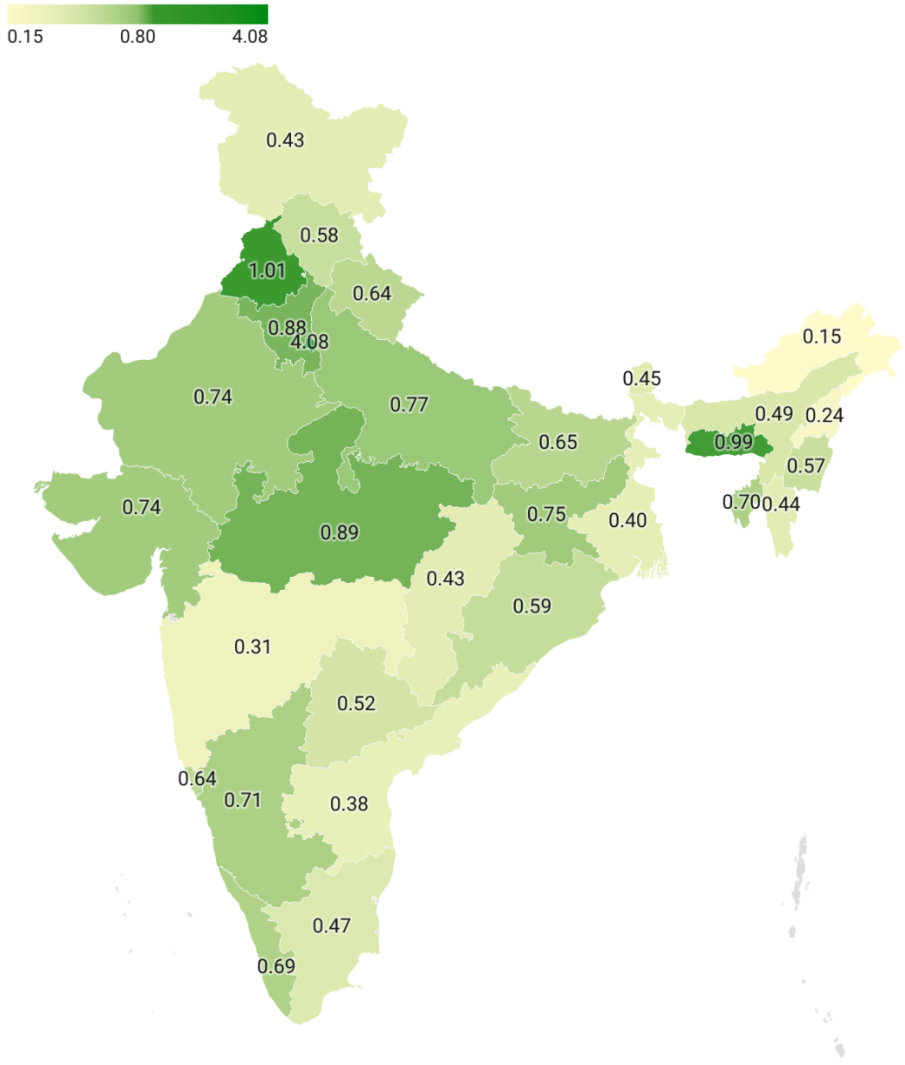


Source: Authors' calculation based on data from Annual Financial Statements of Departments of Law of various States; Union Budget.

2.3 Disparities in Public Funding towards the Judiciary across States

When we analysed the proportion of each state's overall budget allocated towards the judiciary, we found significant disparities among states. If we look at the 2024-25 budget estimates, it is as high as 4.08% for Delhi and as low as 0.31% for Maharashtra (See figure 4). The detailed share of major states is presented in figure 4 below.

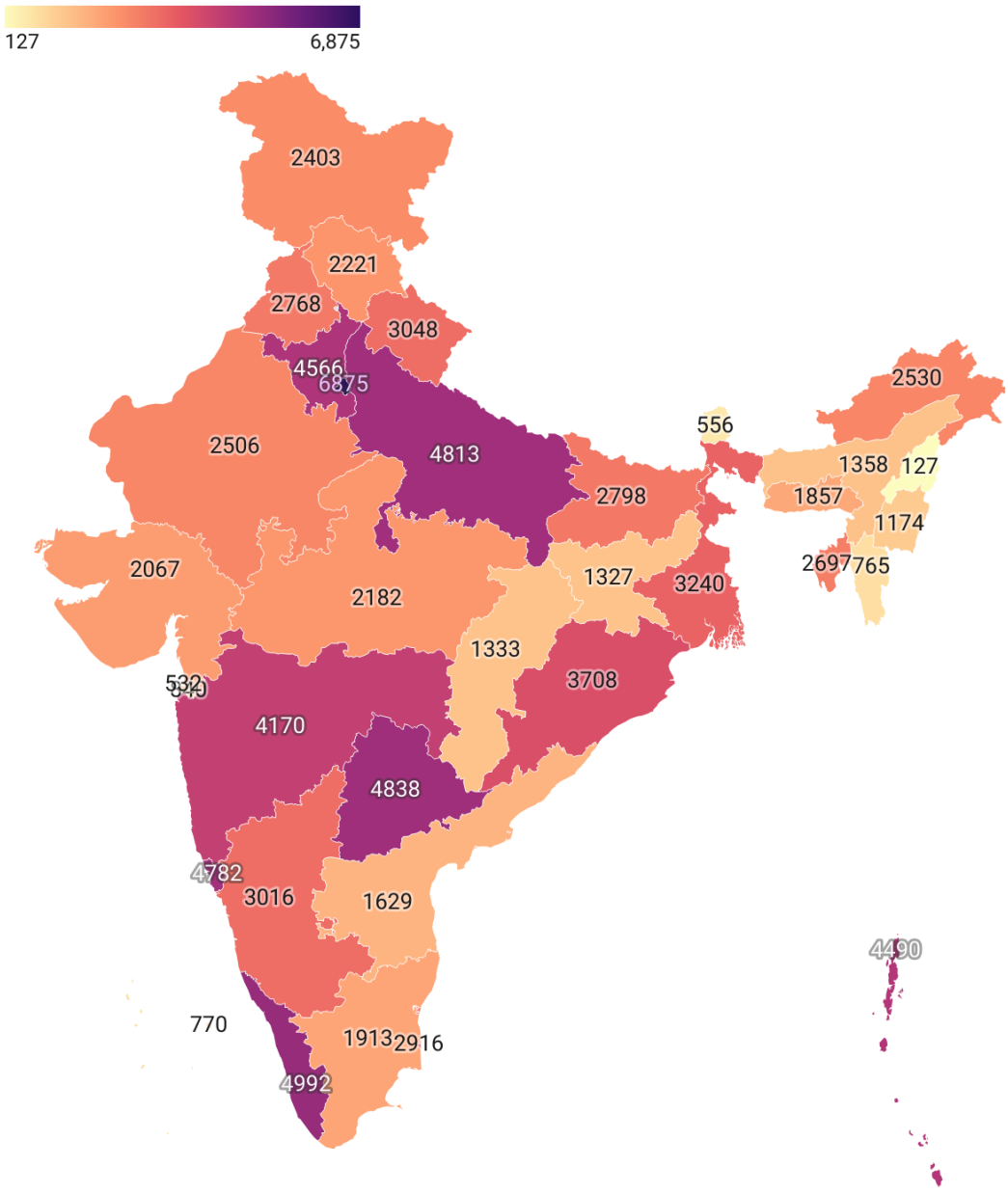
Figure 4 Percentage of state budget allocated towards the judiciary (2024-25 BE)



Source: Authors' calculation based on data from Annual Financial Statements of Various States; Various State Budgets

The burden of pending cases in courts across states also varies quite widely. This can be put into context by comparing it with the population of each state. As per the NJDG data, Kerala has 4992 pending cases per lakh population – the highest of any state, except Delhi (6875 per lakh population) – whereas Jharkhand has only 1327 pending cases per lakh population (See figure 5).

Figure 5 State-wise Pending Cases per lakh of population in 2024



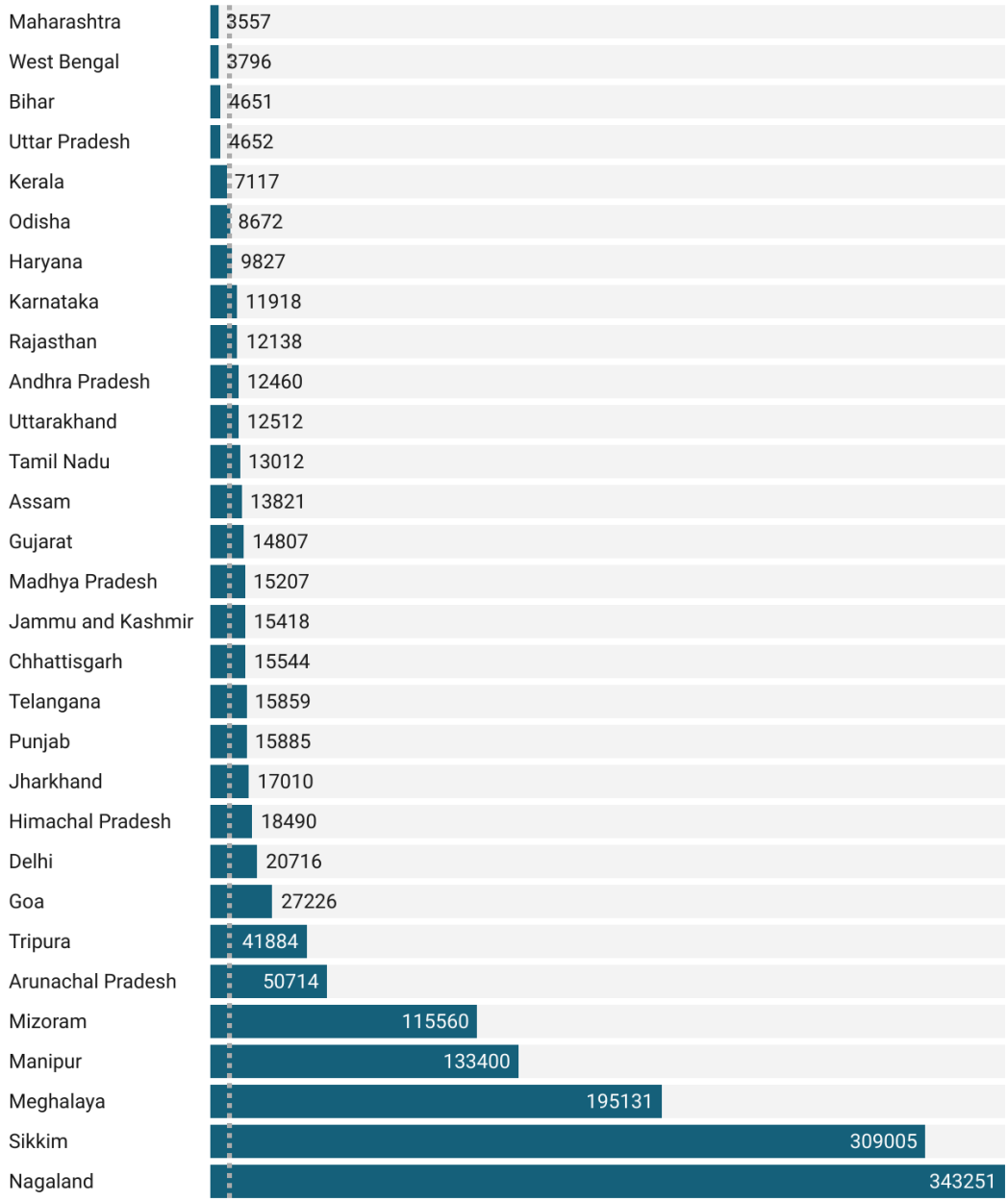
Source: Authors' calculation based on data from Population Projection by National Commission on Population (2019) (estimated for 2024); NJDG, DCI, October, 2024

The impact of the variation among the states' prioritisation of the judiciary on the performance of the judiciary becomes clearer when we view this variation in relation to the burden on their courts. There is a significant disparity across states with regard to the budget of the judiciary per pending case. According to the authors' calculations, the average budget per pending case across all states is Rs. 8,553. State-level, these values range from as high as Rs. 3,43,251 per case for Nagaland to as low as Rs. 3,796 per case in West Bengal.

The reason this metric is important is that the relative priority given to funding of the judiciary in the state does not necessarily mean that the state has adequate resources to address the volume of its

pending cases (DAKSH and CBGA 2018). Take Uttar Pradesh, for example, which has allocated 0.76% of its budget towards the judiciary, which is among the larger allocations by the states. But it has one of the lowest expenditures per pending case, at Rs. 4,652. Figure 6 below represents budgetary spending per pending case by all states in India.

Figure 6 Budget Expenditure per Pending Case (in Rs.) in States (2024-25 BE)



Dotted line represents average of all-India budget expenditure per pending case

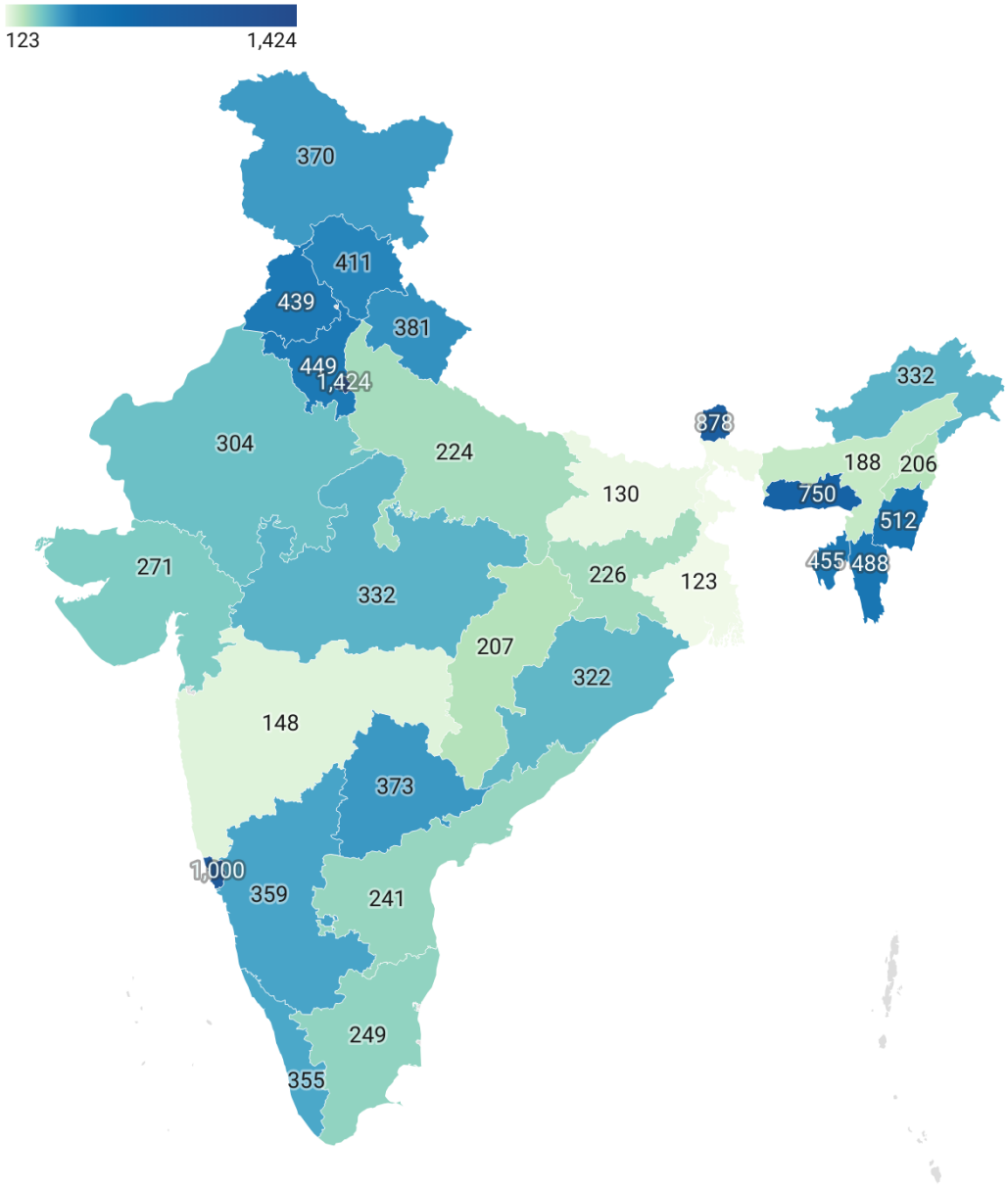
Source: Authors' calculation based on data from Annual Financial Statements of Various States; Various State Budgets; NJDG, DCI, October, 2024

The comparison of the state government's judicial expenditure per capita is another important metric for analysis when it comes to understanding the disparity in budgetary allocation. As per the authors' calculation, the national average for per capita spending on the judiciary in the year 2024-25

is Rs. 276, including both the budgetary allocation by the Union and the state governments. Even within this, there is a considerable disparity, with values ranging from a high of Rs. 1,424 in Delhi to a low of Rs. 123 in West Bengal (see figure 7).

Considering the above numbers in the context of ensuring equitable access to justice across states, it becomes evident that inconsistent budgeting for the judiciary significantly contributes to disparities in access to justice. The uneven distribution of funds results in varying levels of infrastructure quality and judicial services across different states, further deepening the inequalities in the legal system.

Figure 7 Judicial Expenditure (in Rs.) per capita for selected states, 2024-25 B.E



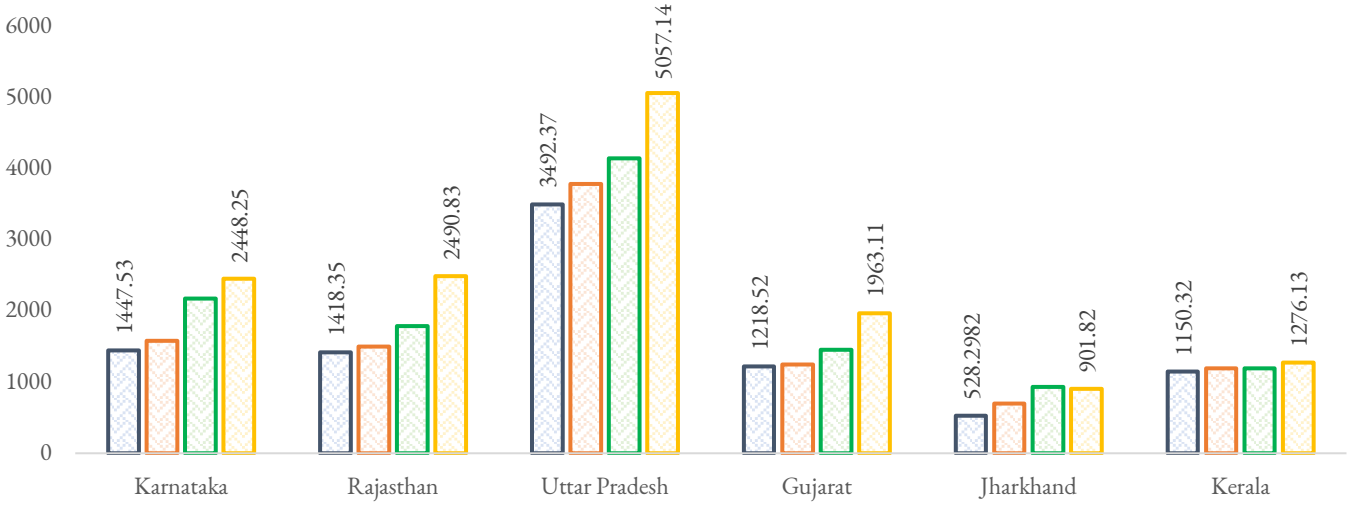
Source: Authors' calculation based on data from Annual Financial Statement of Various States; Various State Budgets; Population Projection by National Commission on Population (2019) (estimated for 2024)

3. Public Expenditure and the Performance of Judiciary: A Comparative Analysis of Six States[2]

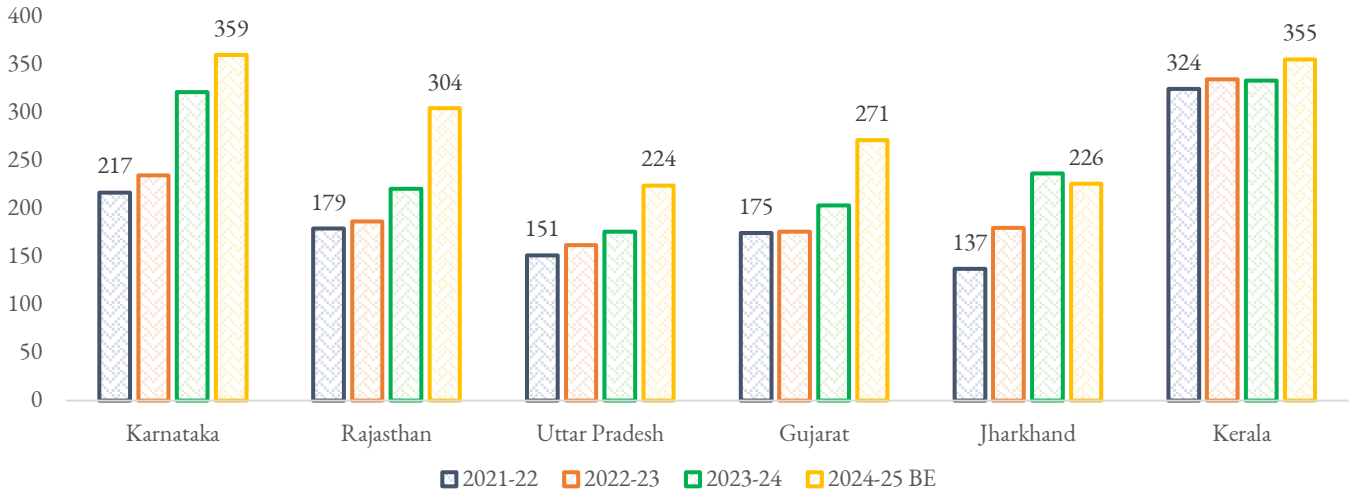
3.1 Trends and Patterns in Expenditure on Judiciary across States

Analysis of Karnataka, Rajasthan, Uttar Pradesh, Gujarat, Jharkhand, and Kerala based on various metrics will reveal the additional patterns of inter-state disparity of expenditure across states. While the budget has increased significantly for Uttar Pradesh (79%) from 2022-23 Actual Estimate (A.E.) to 2024-25 Budget Estimate (B.E.), for Kerala, it has only been a 14% increase, as seen in figure 8a below.

Figure 8:(a) State-wise Trends in Total Budget of Judiciary during Fifteenth FC period (in Rs. crore)



(b) State-wise Trends in Budgetary allocation to the judiciary per capita during Fifteenth FC Period (in Rs.)



Source: Authors' calculation based on data from Authors' calculation based on data from Annual Financial Statement of Various States; Various State Budgets: Various Years; Population Projection by National Commission on Population (2019) (estimated for years 2021-2024)

When we analyse the trend of per capita budgetary allocations to the judiciary (see figure 8b), certain states have performed notably better than others. Rajasthan, for instance, experienced a 70% increase during the 15th FC period. Karnataka (66%) and Jharkhand (64%) also reported substantial growth rates. In contrast, Kerala recorded a relatively modest increase of only 9% during the same period.

3.2 Varying priority of the judiciary budget across states

Table 2 State-wise growth in Judiciary budget and their share in State Budget

State	%growth in 2024-25 BE over 2022-23 A, towards judiciary	Share of state budget in All India expenditure on Judiciary in 2024-24 BE	% of state budget spent on judiciary, 2022-23 A	% of state budget spent on judiciary, 2024-25 BE
Karnataka	48.59	6.17	0.56	0.71
Rajasthan	55.84	6.28	0.43	0.74
Uttar Pradesh	79.1	13.44	0.56	0.73
Gujarat	55.41	5.58	0.53	0.66
Jharkhand	48.62	2.27	0.66	0.75
Kerala	14.01	3.22	0.57	0.69

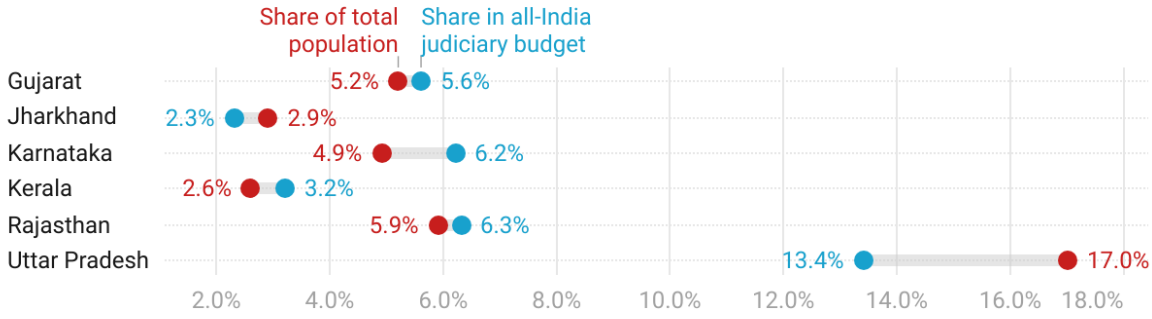
Source: Authors' calculation Authors' calculation based on data from Annual Financial Statement of Various States; Various State Budgets; Various Years; Union Budget Various Years

From table 2, we can see how different states have assigned differing priorities to spending on the judiciary over time. While Uttar Pradesh has drastically increased its budget on the judiciary by 79% (in 2024-25 B.E from 2022-23 A.E), Kerala has increased its budget by only 14%. Rajasthan (38%), Gujarat (33%), and Uttar Pradesh (27%) recorded substantial year-on-year increases in judicial allocations in the 2024–25 B.E. These recent one-year increments suggest that overall growth rates must be interpreted with caution, as recent surges may obscure longer-term spending patterns and priorities.

When we look at other trends within table 2, a positive sign that we see is the equalising trend when it comes to the proportion of state budget allocated to the judiciary in 2024-25 BE. The range among many states is very low, from 0.66% (Gujarat) to 0.75% in Jharkhand. However, it needs to be mentioned that major states like Maharashtra (0.31%) and West Bengal (0.40%) have allocated a lower proportion of their budget to the judiciary in the same period.

Once we factor in the population of each state, the disparity in judicial budgeting becomes even more apparent. If we look at figure 9 below, we can see that there are states disproportionately contributing, like Kerala (3.2% of the All-India budget vs. 2.6% of the All-India population), Gujarat (5.6% vs. 5.2%), Karnataka (6.2% vs. 4.9%), and Rajasthan (6.3% vs. 5.9%), which allocate a higher proportion to the All-India judicial budget compared to their share of the population. States like Jharkhand (2.3% vs. 2.9%) and Uttar Pradesh (13.4% vs. 17%) contribute a lower proportion to the All-India judicial budget relative to their population.

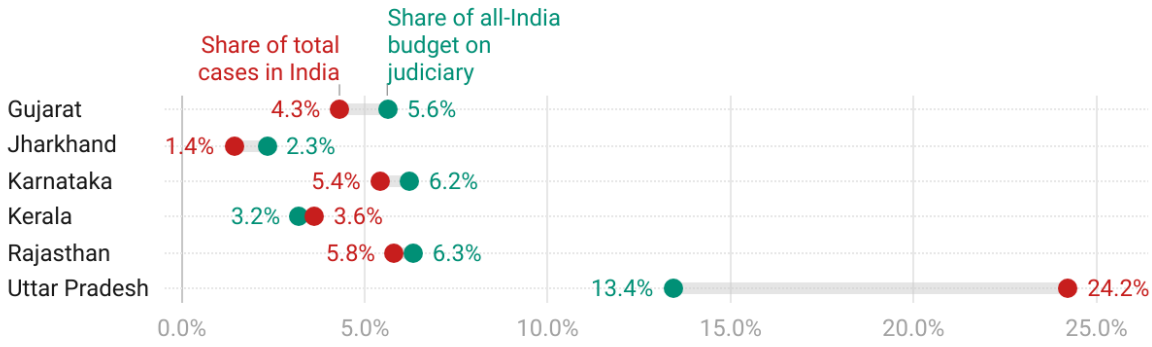
Figure 9 Share of States in All India Judiciary Budget (2024-25 BE) and Population of India



Source: Authors' calculation based on data from Population Projection by National Commission on Population (2019) (estimated for 2024); Annual Financial Statements of Various States; Union Budget.

Disproportionality between the state's share of the total number of cases and its share in the all-India budget for the judiciary. As seen in figure 10 below, there is a large variation in the share of states in the total number of cases as compared to their share of contribution to the All-India judiciary budget. Take Uttar Pradesh, for example, which has 24.2% of the total number of cases in the country in 2024, as compared to its share in the All-India judiciary budget, which is only 13.4% (2024-25 BE). This is in contrast to Gujarat (4.3% of the total number of cases vs 5.6% of the overall judiciary budget).

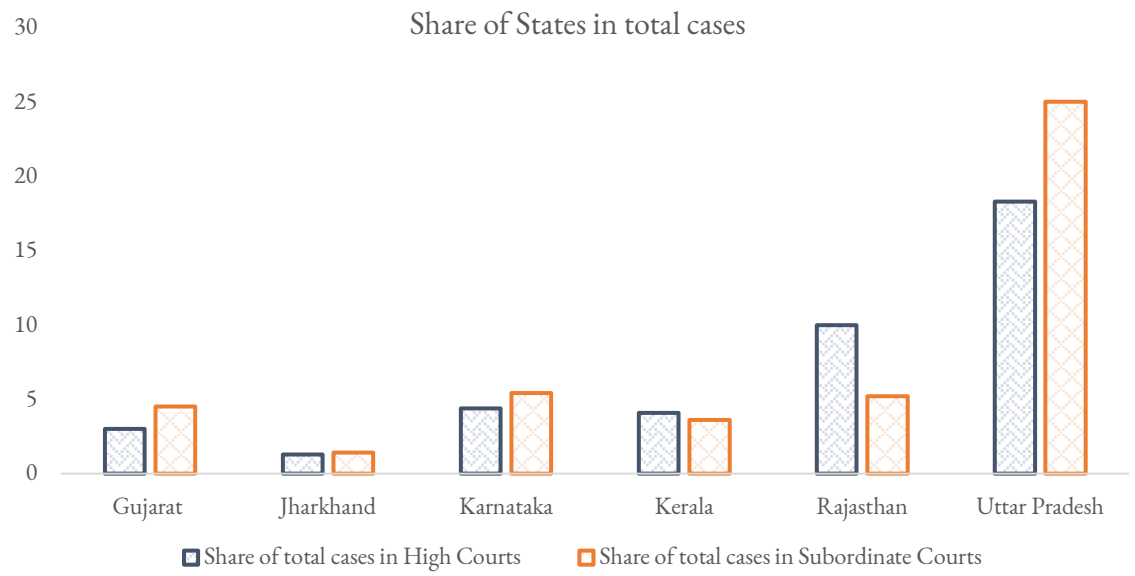
Figure 10 Share of States in total cases at All India level in 2024 and its share in all-India Judiciary Budget 2024-25 BE (in %)



Source: Authors' calculation based on data from NJDG, DCI, October 2024; NJDG, HC of India, October 2024; Annual Financial Statements of Various States; Union Budget

Comparison of share of states in total cases in High Courts and Subordinate Courts. The comparison of share of each of the state's share of total number of cases in the high courts and subordinate courts can help us understand behaviour of each tier of court in the states studied. It enables us to have a better understanding of judicial demand and structural bottlenecks in the various tiers of the judiciary. Figure 11 shows the comparison between the share of each state in the total cases in high courts and subordinate courts.

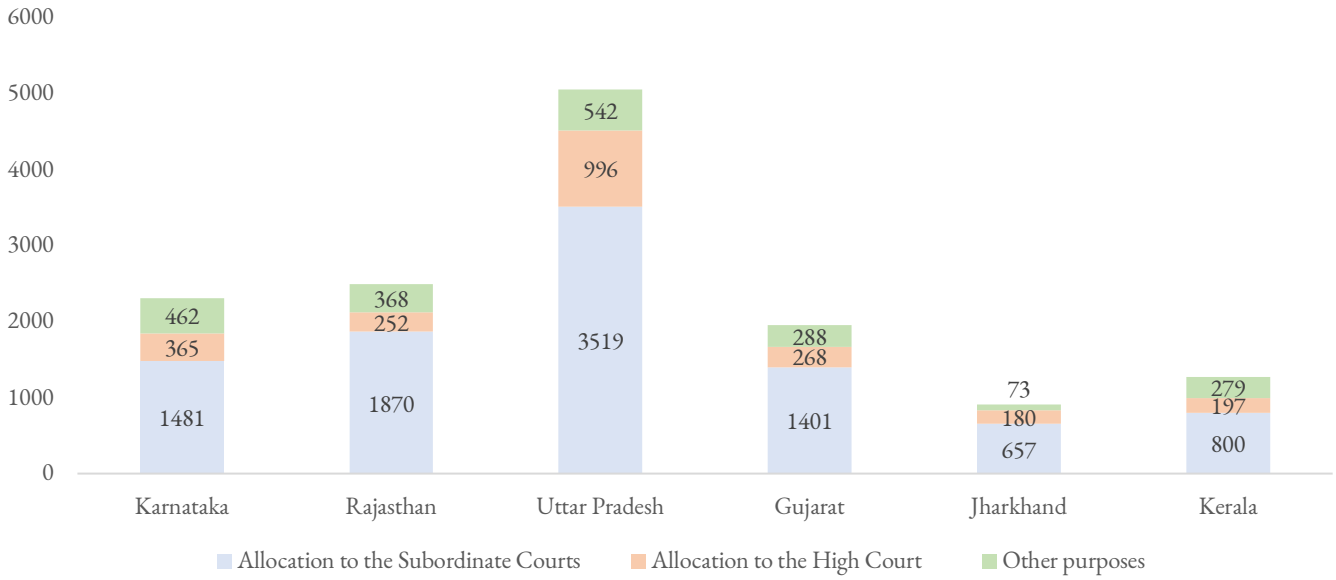
Figure 11 Comparison of share of states in total number of cases in high courts and subordinate courts



Source: NJDG, HC of India, October 2024: NJDG, District Court of India, October 2024

Relative share of subordinate courts and high courts in budgets- When we consider the 2024-25 budget estimate, these six states collectively have allocated 69.5% of the overall budget of the Department of Law (of these six states) to the subordinate courts, and 16.13% towards the high courts (see figure 12). The remaining 15% includes judicial academy expenses, legal counsel expenses, law college aid, etc. The varying expenditure of each state can be seen from figure 12 below.

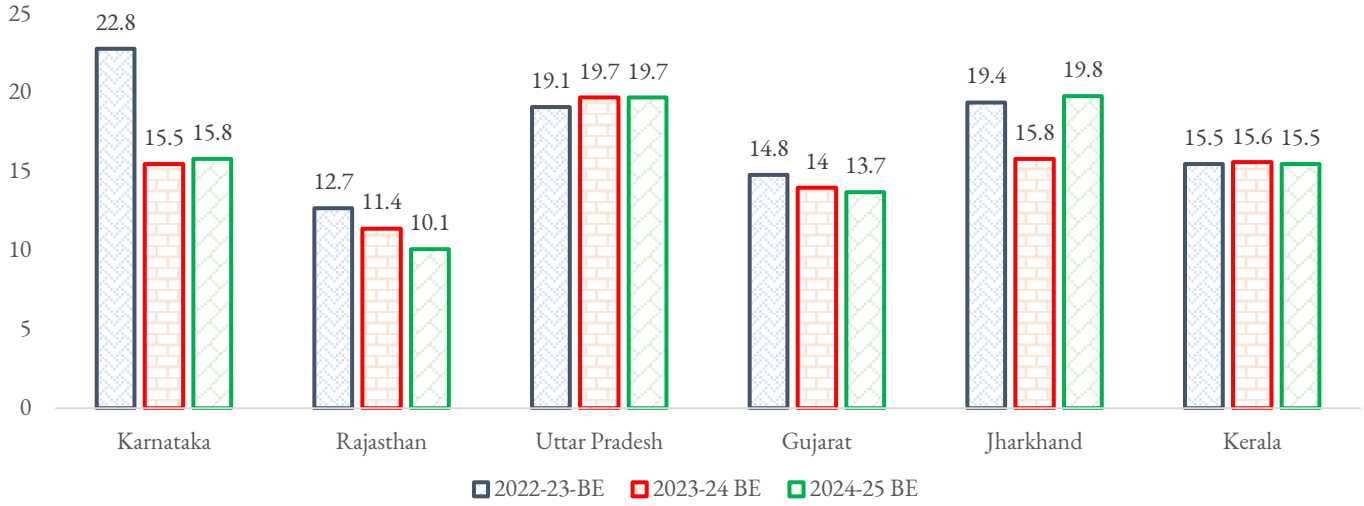
Figure 12 Components of Judiciary Expenditure for 2024-25 BE (in Rs. crore)



Source: Authors' calculation based on data from Detailed Budget Estimates of Various States (2024-25 BE)

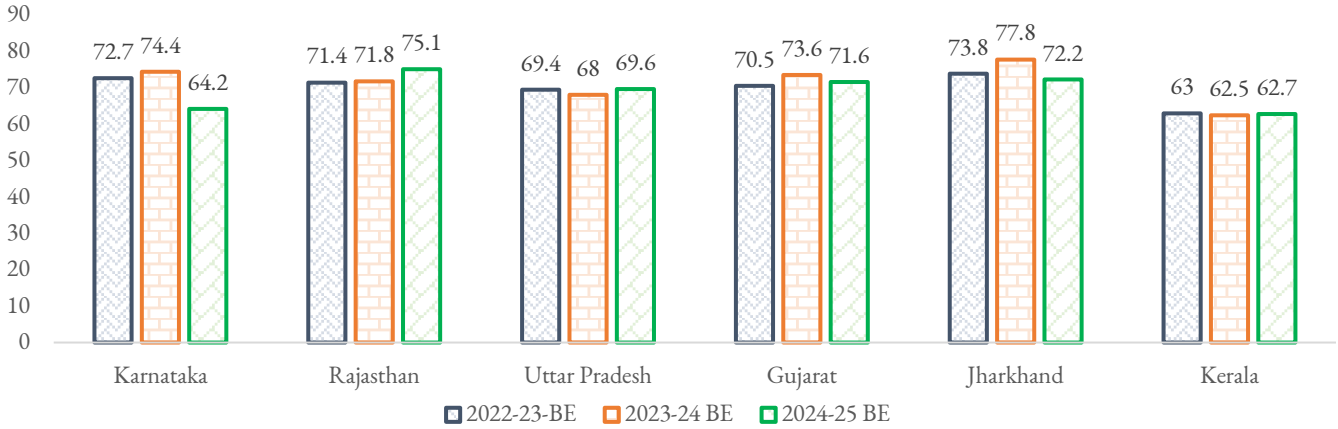
For most of the states under study, the proportion of judiciary budget spent on high courts ranges from 10-22% (See figure 13). Apart from Jharkhand, all the other states have their expenditure on high courts either plateauing or decreasing. At the same time, when we look at the data of the proportion of the judiciary budget spent on the subordinate courts (See figure 14), the number ranges from 10% (in Rajasthan) to 19% (in Jharkhand). There seems to be a plateauing of the proportion of judicial expenditure on subordinate courts across states.

Figure 13 Share of High Courts in budget allocated to the Department of Law (in %)



Source: Authors' calculation based on data from Detailed Budget Estimates of Various States (2024-25 BE); Various Years.

Figure 14 Share of Subordinate Courts in budget allocated to the Department of Law (in %)



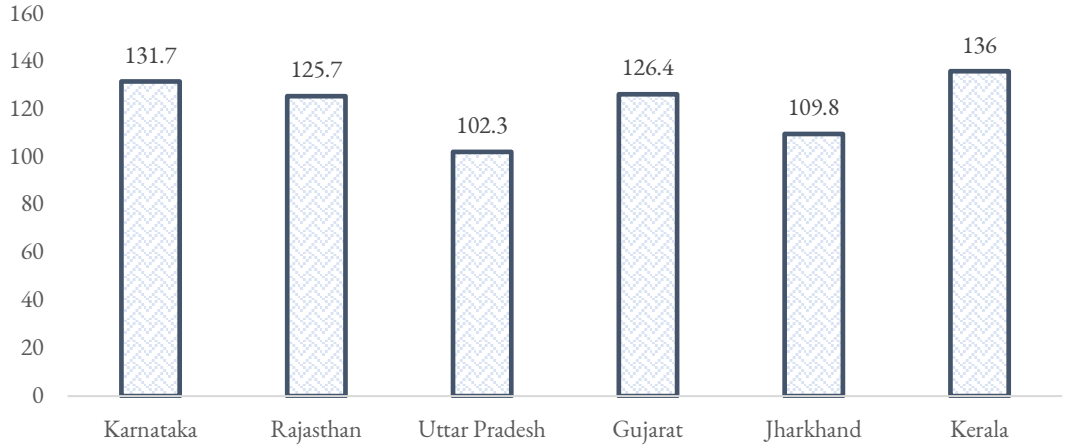
Source: Authors' calculation based on data from Detailed Budget Estimates of Various States (2024-25 BE); Various Years.

3.4 High Courts versus Subordinate Courts: Burden of Pendency of Cases, Priorities in Budgets and Underutilisation of Budgetary Allocations

3.4.1 Average expenditure per court

If we take a look at the average expenditure per subordinate court for the six states selected above, the range is from Rs. 102 lakhs in Uttar Pradesh to Rs. 136 lakhs in Kerala (See figure 15).

Figure 15 Expenditure per subordinate court (in Rs. Lakhs)



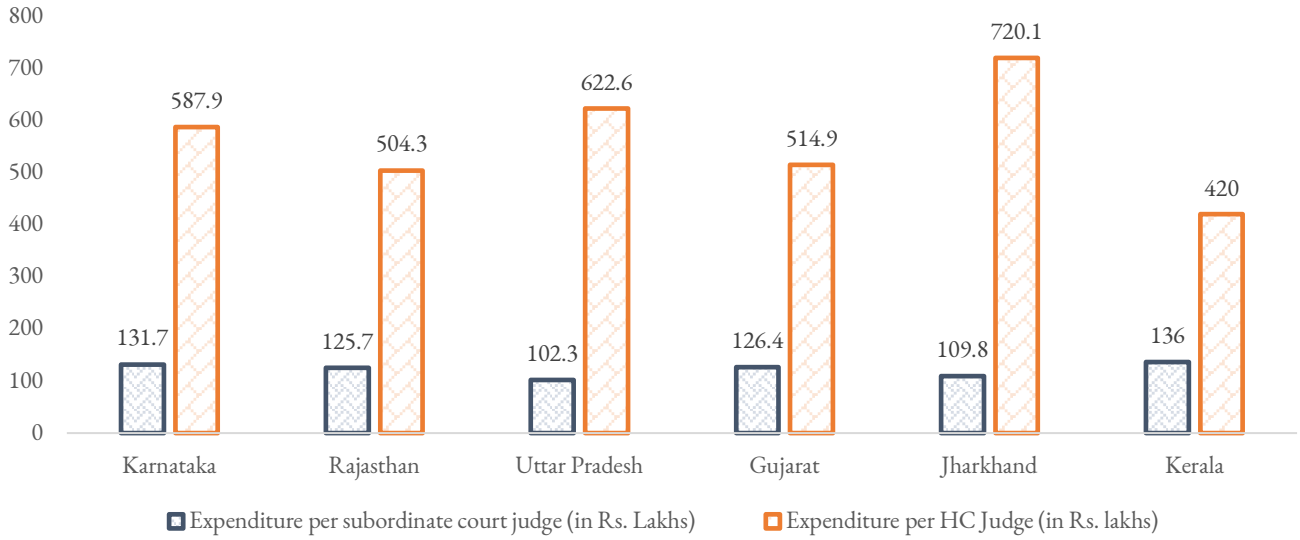
Source: Authors' calculation based on data from Detailed Budget Estimates of Various States (2024-25 BE); NJDG, DCI (Court judge report), November 2024

3.4.2 Average expenditure per Judge

If we take a look at figure 16 below, we see that the average expenditure per judge in the high courts is much higher than the average expenditure per judge in subordinate courts. Considering the expenditure in the six states under this study, the combined average expenditure on high court judges

of the six states is 4.6 times the combined average expenditure on subordinate court judges. There is also a lot of variation even within these six states, with Uttar Pradesh spending 6 times on a high court judge compared to a subordinate judge, and on the other side, Kerala spends only 3 times on a high court judge compared with a subordinate judge.

Figure 16 Comparison of Expenditure per judge, between High Court and Subordinate Courts (in Rs. Lakhs)

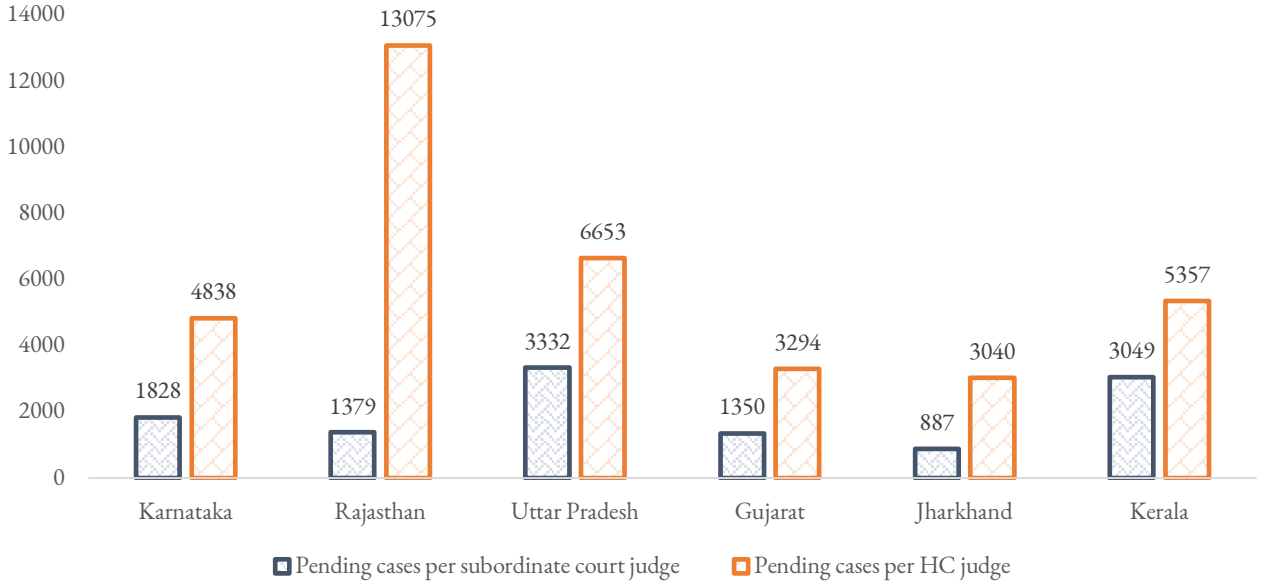


Source: Authors' calculation based on data from Detailed Budget Estimates of Various States (2024-25 B.E.); NJDG, DCI (Court Judge Count Report), October 2024; Department of Justice, Government of India

3.4.3 Case burden per judge –

However, the above metric also needs to be seen in the context of case burden per judge. If we look at figure 17, it can be seen that the number of pending cases per high court judge is around 3 times the number of cases pending with each subordinate court judge. Here also, this ratio differs widely across the states. Even in the 6 states studied, the range is quite high, with Uttar Pradesh having a ratio of 9.48 (cases pending per high court judge to cases pending per subordinate court judge), and then on the other side, there is Kerala with a ratio of 1.75 times.

Figure 17 Comparison of case burden per judge, between High Courts and Subordinate Courts

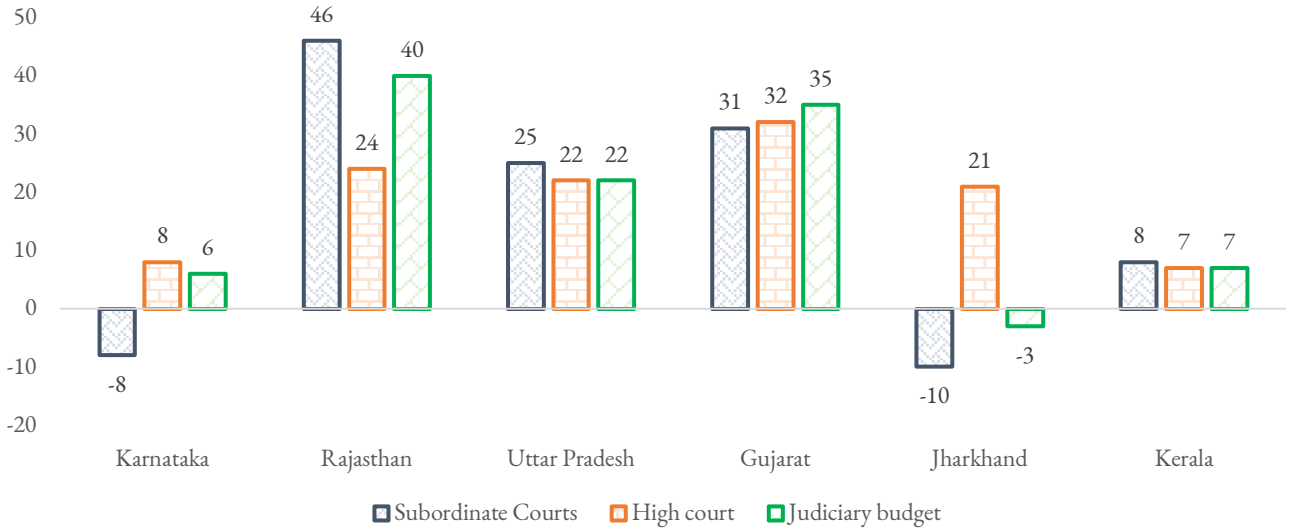


Source: Authors' calculation based on data from NJDG, DCI, October 2024; NJDG, HCI, October 2024; Parliament Questions- Lok Sabha Unstarred Question No. 1354 answered on 26.07.24; Department of Justice, Government of India

3.4.4 Growth in Budget: High Courts vs Subordinate Courts

When we analyse the growth of the budget in 2024-25 B.E. compared to 2023-24 B.E. on each tier of the judiciary (and also overall budget for the judiciary) in each of the six states studied, there is quite a large variance in the growth rate. In Karnataka and Jharkhand, the expenditure on subordinate courts is witnessing a decrease (See figure 18). Jharkhand's overall budget for the judiciary has also fallen. On the other hand, Gujarat, Uttar Pradesh, and Rajasthan are witnessing a huge increase across all components.

Figure 18 Growth rates of the components of the Judiciary Budget, for six States (in %)



Source: Authors' calculation based on data from Detailed Budget Estimates of Various State; Various Years

3.5 Relevance of Finance Commission in Financing of the courts and tribunals and Rule of Law in India

It is in the above context of disparity of budgetary allocation to the judiciary that the relevance of the Finance Commission increases, to correct the imbalances in funding of the judiciary, and also to make policy recommendations. The inequality in budgeting for the judiciary is both horizontal (different priorities and budget size for the judiciary among the states) and vertical (states spend more than 90% of the All-India Judicial Budget). These disparities have far-reaching implications, not only for the judicial system, but also for the broader economic and governance framework of the country.

The above vertical nature of disparity needs to be looked at in the context of the changing nature of taxes imposed by the Union government in recent times. According to a study by the Fifteenth Finance Commission, the share of surcharges and cesses in Gross Tax Revenue of the Union government has gone up from 10.4% in 2011-12 to 28.1% in 2021-22 (Pavithra K.M 2023). According to the Finance Ministry data, the surcharges and cesses have increased by 133% in 5 years between 2017-18 and 2022-23 (IANS 2023).

These surcharges and cesses do not come under the divisible pool of the tax collected by the Union government. As a result, it is only fair if the union government utilises these to allocate more funds towards the improvement of governance in all tiers and wings of the government, especially the judiciary.

The Finance Commission is the appropriate forum through which these changes in financial allocation and policy recommendations can be introduced. The Finance Commission is a constitutional body that is constituted every five years by the Union government to define financial relations between the Union and the state governments, along with local governments.

In addition to this important function, the Finance Commission also recommends grants-in-aid, which are also given to certain sectors like health, education, road infrastructure, agriculture, and sometimes even the judiciary. These grants-in-aid (including sectoral grants) derive their constitutional authority from Article 275, which deals with statutory grants-in-aid to states, and Article 282 (discretionary grants to states) that are incorporated to improve governance and administration across the country (Sixteenth Finance Commission of India 2024).

Sectoral grants started being granted to the judiciary from the Thirteenth Commission onwards. The latest grant towards the judiciary was by the Fifteenth Finance Commission, which granted Rs. 10,425 crore to build more Special Courts (Fast track Courts) for POCSO, heinous crimes, etc. (Fifteenth Finance Commission 2020, 310). The purpose of this grant was to support governance and administrative reforms in India in general, with the strengthening of the judiciary being identified as a key step towards that goal. The basis for this allocation, according to the 15th Finance Commission, was to fulfil the principles of ‘equality of basic services across states' and ‘to address special burdens or obligations of national concern, though within the state’s sphere’.

3.5.1 Need for Improving the Judiciary's Capacity for Budgeting

The underutilisation and under-allocation of funds (by the FC) to the judiciary is mainly due to the judiciary's lack of capacity for budgeting. The judges are usually preoccupied and overburdened with a huge number of pending cases, and often do not have time to focus their attention on infrastructural deficits of the court system (DAKSH and CBGA 2018, 22).

There are also several other obligations tied to a grant from the Finance Commission that also make it harder for the already burdened judiciary to get access to the required funds. For example, a performance audit done by the CAG on the General and Social Sector of Kerala for the year ended 2016 had a chapter that studied the utilisation of funds for the judiciary from the 13th Finance Commission. It reported that Kerala utilised only 54% of the funds allocated to the judiciary by the 13th Finance Commission, and the main reason was the delay in submission of the State Litigation Policy (SLP) by the State of Kerala (Comptroller and Auditor General of India 2017, 61-62). (The State Litigation Policy was intended to ensure the conduct of responsible litigation to reduce Government litigation in courts.) The report stated that the SLP was given 9 months late. The grants from the union government were tied to obligations such as the submission of SLP, and this affected the grant allocation. This is an example of how a lack of capacity within the judiciary, especially research and budgeting-specific expertise, is a major lacuna affecting financial processes.

4. Budgeting for the Judiciary in India

Judicial budgeting processes in India have traditionally relied on historical recurring costs rather than a scientific approach (Durani, Kumar, & Sinha 2017, 225). The judiciary in India follows an incremental approach, where small adjustments are made to the previous year's budget to arrive at the demand for grants for the present year. A policy document prepared by the National Court Management System Committee appointed by the Supreme Court reveals this system of budgeting -

> 'In Taluka Courts, District Courts and High Courts, experience shows that the clerical staff picks up demands as were made in the earlier years for funds and grants and the same is forwarded to the Government by taking signature of the Judges in the Districts or Registrar General at the level of High Court. Most of the Judicial Officers are not proficient in the art of planning and preparation of Budgets so that the Budget meets the requirements for the next year and is neither excessive nor short. Need of expert assistance at these levels is matter of consideration'. (National Case Management Systems Committee 2012, 44)

The problem is not simply insufficient funds but rather improper planning and allocation of financial resources for judicial administration.

4.1 Issues relating to budgeting in the Judiciary

In addition to previously mentioned challenges like underutilisation of funds, inefficient budget planning, manpower shortage and several other issues, the judiciary in India faces several other systemic issues. The following sections delve into those issues.

4.1.1 Nature of fiscal federalism in India and the Judiciary's Funding Constraints

According to the Department of Justice (DoJ), the primary responsibility for funding the infrastructure of the district/subordinate judiciary lies with the state governments. However, India's fiscal federalism creates an imbalance, which results in the union government having access to a larger share of tax revenue than the states. As a result, states have often relied on union government support for major projects, typically provided through grants recommended by the Finance Commission for specific schemes.

With the 14th F.C. recommendations, the responsibility for providing additional funds to the judiciary rests primarily with the states. When the DoJ requested Rs. 9.749 crore in grants towards the judiciary, the Commission endorsed the proposal but directed states to utilise their increase tax devolutions (and grants) to meet these basic needs. This shift has placed a greater burden on the states, potentially impacting judicial infrastructure and efficiency (Department of Justice 2015).

4.1.2 Lack of accountability

A lack of regular audits for judicial budgets is a hindrance to those in charge of planning the budget. While the union government has designed a host of IT platforms for financial accountability, such as the Central Plan Schemes Monitoring System (CPSMS), Public Finance Management System (PFMS), these systems cannot track tangible progress of targets under various schemes. As a result, there is insufficient information on where fund utilisation has been most effective and where it has fallen short.

CAG audits, especially performance audits, are considered the most credible studies on the efficiency and effectiveness of government schemes. If we take a look at all the performance audit reports published by CAG on its website (Comptroller and Auditor General of India 2024), only around 13 reports (from 2009 to 2021) are on the performance of various aspects of the judiciary (Modernisation of the judiciary, utilisation of Finance Commission funds, etc.). These 13 reports are from performance audits done in 11 states (Maharashtra and Mizoram have had such audits done twice). This shows that most states have not done any performance audit of schemes for the judiciary.

As mentioned in the previous sections, funding from the Union to the judiciary has increased in recent years largely due to the implementation of e-Courts Phase 3. Funding under the e-Courts projects is mostly for capital expenditure (technology adoption and upgradation). The e-Courts phase 3 outlay is Rs. 7,210 crore (Ministry of Law and Justice 2024). Given the scale of this project, it is

crucial to assess the outcomes of these expenditures. This can be effectively achieved through regular performance audits conducted by the CAG.

Frequent performance audits by the CAG will enable a better understanding of the schemes and will also enable the creation of a system of performance-based budgeting. Another important outcome is the improved credibility of the judiciary, since at present judiciary representatives have mostly been reluctant to appear before the Public Accounts Committee (an important committee of the Parliament) (Jain, Jain, & Tripathy 2019, 9).

4.1.3 Lack of implementation of funds granted by Finance Commission

As mentioned before, there has been a large underutilisation of grants recommended by the earlier Finance Commissions towards the judiciary. For example, only 20% of the funds recommended by the 13th Finance Commission towards the judiciary were utilised (Surya Prakash 2016, 78). Even when we take a look at the grant made by the 15th Finance Commission, there is a huge shortfall.

According to the information provided in the report of the 15th Finance Commission, for the first three years (2021-22, 2022-23 and 2023-24), Rs. 6,255 crore were supposed to be allocated as grant to all the states collectively for construction of Special Fast Track Courts as well for running existing fast track courts. The report states that 2,530 fast track courts are planned to be started and maintained over the 5 years using the grant made to the judiciary. The reality, however, is much different. According to the reply given by the Ministry of Law and Justice Department to the Lok Sabha on 09.02.2024 (Department of Justice, Ministry of Law and Justice 2024), there are only 851 functional fast-track courts in India. According to the Department of Justice website, there were only 747 fast-track special courts in India as of December 2024 (Department of Justice, Ministry of Law and Justice 2025).

It is to be noted that the establishment of these fast-track special courts began in October 2019, under the Centrally Sponsored Scheme of the DoJ to set up FTSCs (Department of Justice, Ministry of Law and Justice 2025). This was before the recommendations of the present Finance Commission came into effect.

The main issue with the above is that the implementing agencies for the Special Fast Track Courts scheme (court buildings) are the individual State Public Works Departments, and not the judiciary. Therefore, the lack of oversight by the judiciary leads to a lack of prioritisation of building SFTCs. In the subsequent schemes and grants, the judiciary needs to be appointed as the implementing agency. Direct supervision and authority will lead to more effective utilisation of funds (Similar to how the Military Engineer Service, which provides engineering and construction support to the Indian Armed Forces, comes directly under the Army Chief). The 100 percent utilisation of funds by the high courts at the Department of Justice level for the e-Courts phase III 2023-24 tranche (Lok Sabha 2024) is an example of how assigning the judiciary the responsibility will improve utilisation of funds (High Courts are the implementing agencies of e-Courts projects).

In addition to the above, a recent study published in a daily newspaper suggested that several states in India do not have any functional special fast-track courts (these include major states like Odisha, Kerala, Rajasthan, and Telangana) (Ahamed & Biswas 2024). The reason for this is the lack of resources. The grant for setting up special fast-track court is given by the Union government, but the daily operations are to be done by the states, and the states are fund-constrained to run these special fast-track courts.

Also, the study mentions that the addition of special fast-track courts has not led to a decrease in case pendency in these high-priority cases. The remedy offered by the study is improved adoption of digital infrastructure and technology, in addition to improvements in forensic sciences. Therefore, merely adding Special Fast Track Courts is not a solution. The 16th Finance Commission needs to look at technological and scientific infrastructure as a means to improve judicial performance in India.

4.1.4 Lack of a holistic vision

Budgeting is generally an outcome of the vision for the institution or the sector. If there is no coherent long-term vision that an institution is working towards, it will show up in its resourcing plan. There is a need for a long-term vision for the law and justice system to be fleshed out with clarity on short-term, medium-term, and long-term plans to realise the vision.

5. Reform Suggestions to the Sixteenth Finance Commission on Grants for the Judiciary

The grants made by the Finance Commission towards the judiciary in the previous years have largely been for the construction of newer Fast Track Special Courts (FTSC) and the maintenance of existing FTSCs (Fifteenth Finance Commission 2020, 16). The FTSCs, as mentioned in the previous sections, have not led to a decrease in case pendency in those high-priority cases, and the FTSCs are also facing funding issues due to the fund constraints faced by the state governments (Ahamed & Biswas 2024), ultimately leading to several FTSCs becoming non-functional.

In this context, it is important that the Finance Commission reexamines the purpose of grants towards the judiciary. The funding needs to go beyond the addition of FTSC, and should look at strengthening the institutional capacity of the judiciary. We suggest the following reforms that are aimed at improving not only the budgetary aspects, but also addressing other concerns pertaining to resource allocation like shortage of judges and court-staff.

5.1 Establishment of Reform and Research Offices

As proposed in the Memorandum to the 15th Finance Commission (DAKSH and CBGA 2018, 25), we are advocating for establishment of Reform and Research Offices in each high court and in the Supreme Court. These teams need to be comprised of personnel with expertise in judicial system, technology (specifically data science), behavioural science, and judicial policies. Each of these teams,

with Judicial Officers supported by a team of experts in data science, behavioural science, and organisational development, will be formed to study the judicial process and performance, and identify issues affecting the performance of courts, and then accordingly formulate solutions for the same.

The teams' duties and authorities need to be well-defined, and the differences in the work done by them and the registry staff should be clearly explained and understood. This will enable a cooperative environment for both the reforms team and the registry staff. Also, it is essential to have an appropriate authority for oversight, like the Chief Justice of India for the Supreme Court or a committee of judges for the High Court (DAKSH and CBGA 2018, 25).

We estimate the total cost of one such office over the Sixteenth Finance Commission period to be Rs.30.12 crore. (See Annexure A for more details)

5.2 Secretariat for Judicial Appointments

The perennial issue of shortage of judicial officers and court staff was elucidated in the previous sections of this paper. This issue would require a dedicated team to calculate the requirement of human resources in a court. At present, it is done by the court registry staff, who are already engaged in several other responsibilities. The process of appointment to the judiciary is a long one, involving several tasks like calculation of required strength of judges based on the present (and also projected future) number of pending cases, requesting for applications for the posts, processing the applications, and evaluating the applicants for their experience and suitability (DAKSH and CBGA 2018, 25-26).

As mentioned in the Memorandum to the 15th Finance Commission (DAKSH and CBGA 2018, 25-26), we propose the creation of a Secretariat for Judicial Appointments in each High Court and the Supreme Court. These Secretariats will be able to dedicate their resources specifically to the administrative and procedural process of judicial appointments, thereby improving the efficiency and speed of the selection process.

We estimate the total cost of one such Secretariat over the Sixteenth Finance Commission period to be Rs.15.32 crore. (See Annexure B for more details)

5.3 Capacity for Technological Initiatives

While e-Courts Phase 3 has made substantial allocations (Rs. 7210 crore over 4 years, approved in October 2023) towards technology for courts, the human resources aspect of the project is unclear. While the process of digitisation of courts is ongoing with assistance from the NIC, a dedicated state-level team with technological expertise as proposed in the 'Memorandum to the 15th Finance Commission' (DAKSH and CBGA 2018, 26) should be established to formulate and implement the tools and training required to address the needs of the judiciary. With the e-Courts Phase 3 funding ending in 2027, this allocation by the Finance Commission will ensure that the initiatives undertaken under e-Courts Phase 3 are sustained over the next few years.

We estimate the cost of such a team at the High Court level over the Sixteenth Finance Commission period to be Rs. 7.53 crore. (See Annexure C for more details)

5.4 Budgeting Practices Initiative

As has been mentioned several times in the previous sections, the capacity of the courts in terms of budgeting processes needs significant improvement. This would require a dedicated team to research the data on several aspects like expenditure, crime records, court data, etc. to estimate present and future requirement of resources to help the court to dispose of the cases efficiently (DAKSH and CBGA 2018, 26).

As mentioned in the Memorandum to the 15th Finance Commission (DAKSH and CBGA 2018, 26), we recommend the creation of a team at each High Court, to strengthen budgeting practices.

We estimate the cost of this initiative over the Sixteenth Finance Commission period to be Rs. 7.34 crore. (See Annexure D for more details)

5.5 Pilot Projects

As proposed in the Memorandum to the 15th Finance Commission (DAKSH and CBGA 2018, 26), we suggest conducting pilot projects at the district or taluka level (or even at the individual court level) to help understand and evaluate the effects of the above reform suggestions. Conducting the pilot projects can help enable understanding of the effects of these reforms at a micro level, and to understand how certain changes might be required to be tailored in each of the reform processes for each region to improve the performance of the courts. The effects evaluated at the micro level can be used to estimate their effect at a macro level (DAKSH and CBGA 2018, 26).

5.6 Transforming Tribunals

The union and state governments have established various tribunals to leverage domain experts as adjudicators, flexible procedures, and alleviate the pressure on already over-burdened courts. Tribunals, especially at the union government level e.g., NCLT, NCLAT, TDSAT, ITAT, CESTAT, GSTAT, CGIT, etc. have the potential to improve the ease of doing business and investment lifecycle. However, their functioning has fallen short of expectations and suffers from the shortcomings that regular courts do. The Finance Commission could revitalise the tribunals by allocating funds for their transformation.

5.7 Creation of Single Source for Laws

Every citizen encounters the impact of some legislation or the other at some time in their lives. Hence, the importance of disseminating information about laws cannot be understated. One of the basic elements of the rule of law is making laws available widely and ensuring that they are clear and certain. Access to laws is a significant component of access to justice. Accessing and disseminating

laws in India will involve collating all the existing primary and subordinate legislations, ranging from municipal laws to central legislations (Sandhya P.R 2021, 9).

In the Indian context, aggregating all laws in a digital format in one place will significantly improve clarity and access. Past attempts toward this objective, like India Code, lack vision and are poorly implemented (Sandhya P.R 2021, 25-26). The single source for law must be a digital point of reference that is comprehensive, updated, authentic, and reliable for the entire nation. This assumes even more importance in the age of AI, where data sets are required to train AI models for law and justice, a sovereign function.

5.8 Revisiting court fees and imposition of costs regime

Court fees play a huge part in the adoption, feasibility, and sustainability of the court facilities. The Finance Commission should encourage courts and governments to revisit the court fees and the imposition of cost regime. The regime should ensure a balance of affordability and accessibility for litigants, along with ensuring maintenance and continuous improvement of the physical and digital infrastructure of the courts and tribunals.

As per our estimations, the cost of conducting the initiatives (4.1) to (4.4) above, at any one location is Rs. 60.30 crore, and across the Supreme Court and 25 High Courts, it would total to around Rs.1,600 crore.

6. Conclusion

In this paper, we have highlighted the vertical inequality in the contribution of the Union and the State governments towards the judiciary. The Union government depends on the subordinate judiciary to enforce the legislations of the Union government; despite this, the Union government contributes only 6.5% of the proportion of the all-India judiciary budget. This is despite the fact that the states' share in the central divisible pool has been reducing consistently due to the increased surcharges and cesses.

We have also highlighted the horizontal disparities in the funding and prioritisation of judicial budgets by individual states. We have presented these inequalities in the context of various states' populations and case pendency per lakh population. This showed the inability of each state to increase their budget towards the judiciary in accordance with case burden (per lakh population). There are also inequalities persisting in budgetary allocation between various tiers of the judiciary, with subordinate courts getting much less than high courts.

Despite a large grant to the judiciary by the 15th Finance Commission, the funds largely remain unspent, as was the case with previous Finance Commission grants towards the judiciary as well. This is mainly due to the inefficient and outdated administrative procedures, and also due to the lack of capacity on the part of the judiciary to monitor the utilisation of funds. Therefore, there needs to be

an emphasis by the 16th Finance Commission towards capacity building and quality of expenditure measures, which can improve the law and justice system in the medium to long term.

In this paper, we have proposed several initiatives and policy recommendations to enhance the budgeting and resource allocation process in the judiciary. These initiatives aim to transform the judiciary through the introduction of a multidisciplinary research team to study and propose solutions for issues affecting judicial performance, introducing rigorous budgeting practices through a budgeting practices initiative team, the development of technological offices, and a dedicated secretariat to efficiently expedite the process of judicial appointments.

These measures would require the employment of professionals with experience in fields such as budgeting, research, and technology. Additional reforms like the transformation of tribunals and reintroducing a single source of law, which is comprehensive and reliable, are also suggested in the paper as a means to improve the ease of doing business and investment lifecycle and the strength of the rule of law in India.

The reforms suggested in this paper are aimed at addressing the perennial inefficiencies and disparities in the quality of the delivery of justice and the functioning of the judiciary. By introducing an in-depth, evidence-based, and research-based understanding of the judiciary's needs and performance, these suggestions aim at creating a more efficient and capable judicial system. The improved performance of the judiciary will enhance the credibility of the courts in India, which in turn improves access to justice and the rule of law in India.

Enhanced access to justice also generates positive effects on a nation's social and economic development. Consequently, it is imperative for the judiciary and the Finance Commission to engage in dialogue on this critical topic.

Annexure

Annexure A: Cost and Resource Estimation for Reform and Research Offices

Note: The following team composition and other expenditure particulars, present from annexure A to annexure D, are based on the plan proposed in Memorandum to the 15th Finance Commission on Budgeting for the Judiciary in India (DAKSH and CBGA 2018, 29-34). The costs are calculated in accordance with present and projected Dearness Allowance, House Rental Allowance and Transport Allowance levels. Also to be noted is that the cost figures will change once the 8th Pay Commission (expected to be constituted soon) salary matrix is implemented[1].

Establishing a Reform and Research Office would require:

1. A dedicated team of Judicial Officers, comprising:
    a. 1 Reform Office Head at the Joint Registrar Level Pay Band- 4 (Grade Pay- 37400-67000 & Level 13-A)- Cost estimated to be Rs. 1.96 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).
    b. 5 team members At the Deputy Registrar Level PB- 4 (Grade Pay- 37400-67000 & Level 13)- Cost estimated to be Rs. 8.43 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).
    c. 10 Support team members at the Assistant Registrar Level/ Deputy Controller of Accounts PB- 4 (Grade Pay- 15600-39100 & Level 12)- Cost estimated to be Rs. 11.01 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

2. A six-member external technical support team comprising experts hired on consultancy contract to advise and support the dedicated team. The external team would consist of the following:

a. 1 Senior Expert and

b.1 Expert each in three areas of research and reform including: Organisational Development, Data Science and Behavioural Science. The team would receive a consolidated monthly consultancy fee of Rs.2 lakh per Senior Expert and Rs.1 lakh per Expert.

Cost collectively estimated to be Rs. 6.61 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

Other costs like capital expenditure (laptops, furniture, etc.) and admin costs are estimated to be at Rs. 2.12 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

- We have referred to the Report of the Seventh Pay Commission (2015) for the pay matrix. We have also referred to the pay scale of the Supreme Court (Supreme Court of India 2024) and Delhi High Court Officials (Delhi High Court 2017) as the basis for the calculation.

[1] For a detailed breakdown of the costs, refer to the annexure section of the working paper available at: https://www.dakshindia.org/budgetary-allocation-to-the-judiciary/

- Dearness allowance has been projected for 2026-27 onwards in accordance with yearly increase till 01.07.2024 (53 % D.A). House Rental Allowance (30 %) has been calculated in accordance with rate applicable for X city (population above 50 lakhs) as per the Compendium released by the Ministry of Finance and Department of Expenditure in Notification No. 2/4/2022-E.II B. (Rathod, 2024) Therefore, the ultimate fund requirement will be lesser than our estimated cost, since most high courts are in Y city (Population of 5 to 50 lakh) where the House Rental Allowance is 20% presently.
- Cost estimates of the external team are based on market rates.

Annexure B: Cost and Resource Estimation for Secretariat for Judicial Appointments

The proposed Secretariat will comprise:

1. 1 Head the Joint Registrar Level PB- 4 (Grade Pay- 37400-67000 & Level 13-A)- Cost estimated to be Rs. 1.96 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).
2. 3 Senior Team Members the Deputy Registrar Level PB- 4 (Grade Pay- 37400-67000 & Level 13)- Cost estimated to be Rs. 5.06 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).
3. 5-member Support Team the Assistant Registrar Level/ Deputy Controller of Accounts PB- 4 (Grade Pay- 15600-39100 & Level 12)- Cost estimated to be Rs. 5.50 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

Other costs include operational costs (recruitment process, vetting, handling complaints, etc.), capital expenditure (laptops, furniture, etc.) and admin cost, which are collectively estimated to be Rs. 2.78 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

The above team may be allowed to consult Human Resource specialists whenever required in order to improve the quality and strategy of selection process. The expenditure on technical support can be sourced from the heading 'Operational Cost' (DAKSH and CBGA 2018, 32).

Annexure C: Cost and Resource Estimation for Technology Offices

This initiative comprises:

1. 1 Joint Registrar at PB- 4 level (Grade Pay- 37400-67000 & Level 13-A) as Head- Cost estimated to be Rs. 1.96 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31) and
2. 2 IT Specialists at the level of Deputy Registrar Level PB- 4 (Grade Pay- 37400-67000 & Level 13). – Cost estimated to be Rs. 3.37 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

Other costs like operational costs, capital expenditure, and admin costs are estimated to be Rs. 2.18 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

The IT specialists can either be recruited on a regular basis or can be hired on contract.

Annexure D: Cost and Resource Estimation for the Budgeting Practices Initiative

The Budgeting Practices Initiative team will comprise:

1. Research Coordinator at the level of Administrative officer (Judicial) PB-3 (Grade pay 15600-39100 & Level 11)- Cost estimated to be Rs. 0.95 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).
2. Senior Research Officers at the level of court officer/Reader/Sr. PA PB- 2 (Grade Pay- 9300-34800 & Level 9)- Cost estimated to be Rs. 1.52 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31) and
3. 3 Research Associates at the level of Asst Lib/ Judicial Asst./ PA PB-2 (Grade pay- 9300- 34800 and level 6)- Cost estimated to be Rs. 1.52 crore (for five years from F.Y. 2026-27 to F.Y. 2030-31).

Other costs capacity building, research support from external specialists, capital expenditure, furniture and admin costs collectively are estimated to be Rs. 3.34 crore. (for five years from F.Y. 2026-27 to F.Y. 2030-31).

The team mentioned above may be allowed to consult organisations which have expertise and specialisation on research focussed on government budget. This can enable a holistic improvement on budgeting practices by learning from the best practices around the country and the world (DAKSH and CBGA 2018, 34).

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Notes

[1] This paper builds upon the structure, methodology, analysis and metrics used in the Memorandum to the 15th Finance Commission on Budgeting for the Judiciary in India (DAKSH and CBGA 2018). See: https://www.dakshindia.org/wp-content/uploads/2019/06/Memorandum-on-Budgeting-for-Judiciary-in-India-from-CBGA-Website.pdf. The working paper version of this article was published on DAKSH website. You can read the working paper at: https://www.dakshindia.org/budgetary-allocation-to-the-judiciary/

[2] The six states analysed in this section were selected based on their geographical spread, economic significance (measured by State GDP), and number of cases pending to ensure a diverse and representative sample for studying judicial budgets.

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IPPR

Medical Device Industry of India: Growth Dynamics and Key Challenges

Shailender Kumar Hooda[*#]

Abstract

Medical devices are one of the most crucial segment of a country's healthcare system. This paper reviews the demand and supply side factors, including socio-economic, market-enabling, technological and policy instruments, that could drive the growth of the medical device industry. It highlights some key issues and challenges the sector is grappling with. Despite there being several enabling factors for the sector's growth, India primarily manufactures medical equipment within the low-tech segment, from consumable to implantable devices. This leaves domestic requirements unmet in other segments, pushing the country to import expensive equipment in the advanced technology segment. This drives up the cost of medical equipment, leading to higher diagnostic test fees for end-users, which in turn places a significant out-of-pocket financial payment burden on households for diagnostic services.

Keywords: Medical Devices, Manufacturing, Diagnostic Test, Retail Price, End-Users, Medical-Technology, Medical Device Park, PLI.

JEL Codes: L6, L640, L650

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1. Introduction

The medical devices are a crucial segment of India's healthcare system (GoI, 2023a). Medical technology plays an important role in improving healthcare, saving lives, and ensuring better health outcomes, especially for those with chronic conditions, emergencies, or life-threatening illnesses. It encompasses a wide range of tools, devices, and techniques used to diagnose, treat, and manage various medical conditions (WHO 2007). It helps in both preventative care and advanced treatments, making healthcare more efficient, accessible, and effective across the globe (Haleem et al., 2022).

Globally, the demand for medical devices is rising, driven by technological innovations, the rising burden of chronic diseases, an aging population, and the global emphasis on preventive care (Thomas et al., 2023). As healthcare continues to evolve, medical devices expected to play an increasingly pivotal role in improving patient care, expanding access to healthcare, and reducing healthcare costs. Literature suggests that local manufacturing of medical devices is crucial in ensuring sustainable, effective, and affordable healthcare (PHFI 2023; IQVIA 2018).

Globally, this sector has experienced significant growth in the past decade (IBEF 2024). The growth potential of the Indian medical device sector is also immense (GOI 2023b; IBEF 2024), driven by several interrelated factors across socio-economic, market-enabling, technological, and policy dimensions. While these factors are critical for the continued growth of the sector, they are often either overlooked or only cited as potential enablers in many reports or discussions. Existing studies focus on aspects like market size, investment inflows, and overall sector performance (GOI 2023b; IBEF 2024; EY 2024), rather than a comprehensive analysis of the foundational elements that could drive the sector growth. The purpose of this paper is to highlight the role of these enablers and emphasize how, collectively, they can shape the future trajectory of the sector. It also highlights the need of prioritising local manufacturing for affordable diagnostic services along with the key challenges and issues associated with the sector.

The enabling factors have been classified around socio-economic factors, market-enabling factors, technology factors, and policy factors.

- Within the socio-economic factors, the role of rising level of income, urbanisation, a growing population, aging demographic, changing disease burden, increasing awareness and knowledge of various critical diseases, and shifting consumer preferences in driving the sector's growth are discussed.
- Market-enabling factors generally include the development of both public and private healthcare infrastructure, increasing health expenditure, promotion of government funded health insurance schemes, a growing preference for taking up private health insurance, and the rise of medical tourism.
- Technology-driven factors include foreign technology (that includes FDI), more affordable and innovative medical devices, e-commerce and digitalisation. The rapid adoption of robotics, big-

data, telehealth, wearables etc., advanced with artificial intelligence (AI), may further fuel the growth of this sector (FBI 2025).

- Policy factors include government initiatives towards regulatory reforms, including promoting / facilitating the global acceptability of domestically-manufactured equipment, the medical device policy, Production-Linked Incentives (PLI), promotion of medical device parks, and initiatives for promoting R&D (like the scheme for 'Promotion of Research and Innovation in Pharma and MedTech Sector' (GoI, 2023c).

These factors are broadly classified into demand-side and supply-side factors.

- Demand-side factors include the macro-economic, demographic profile, disease burden, health policy instruments, growth of private hospitals and diagnostic centres, shifting equipment demand from hospital to household level, growing medical tourism, and role of technology in reshaping the sector demand.
- Supply-side factors are summarised around GeM, a public procurement platform for boosting the domestic manufacturing demand, reform in medical device regulation (MDR) for improving the quality and global acceptability of medical device equipment, policy promoting medical device manufacturing through capital and other incentives like the special incentive package scheme, foreign direct invest, Make-in-India policy for medical device, promotion of medical device park and production linked incentive scheme for medical device sector.

The paper is primarily descriptive in nature. The paper begins by outlining the key factors that drive the growth of the medical device sector, followed by a discussion of the key challenges.

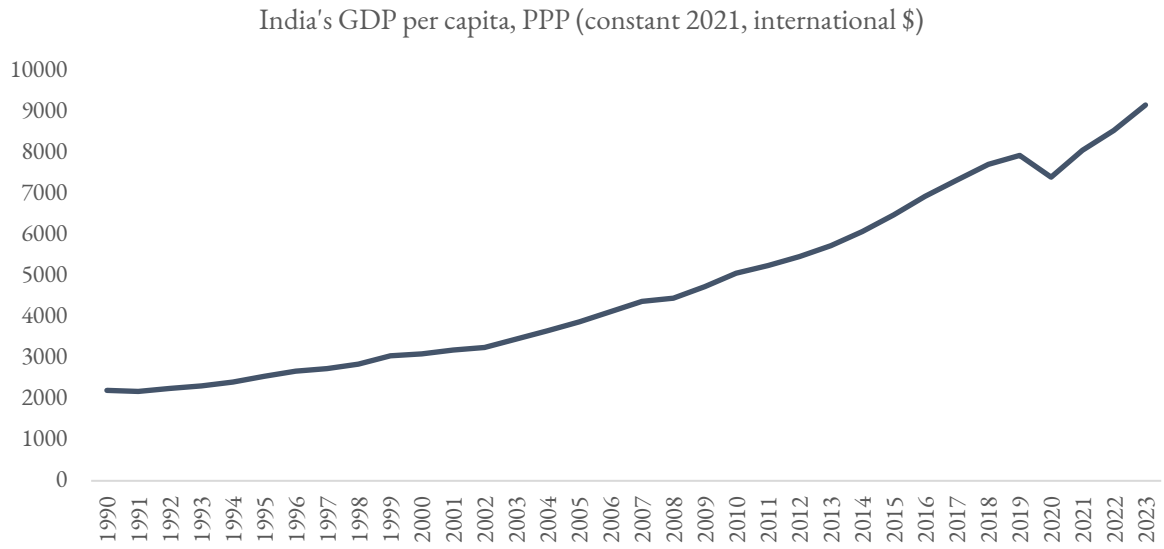
2. Socio-Economic Factors

2.1 Macro Aggregates and Disposable Income

India aspires to be a $5 trillion economy by 2027 (PIB 2018; PIB 2022). The disposable income of individuals is also rising (MOSPI 2023; Figure 1), which means that more and more people are capable of affording medical care. With the increase in income, the middle class grows, and more people opt to live in urban areas. The growing middle class population are highly likely to invest in health and wellness devices, such as fitness trackers, hearing aids, home diagnostic equipment, etc. (AMR 2024).

Similarly, more people moving to cities translates to higher demand for advanced medical devices, both in hospital and clinics. The greater access to healthcare services would lead to increased diagnosis and treatment, which, in turn, creates demand for more devices. The lifestyles of people also changes with growing urbanization, which will boost device demand related to diabetes, obesity, hypertension, and respiratory problems, etc. (Phadke 2024). Growing income also leads to demand for high technology driven devices.

Figure 1: India's Per Capita Income at constant PPP



Source: https://ourworldindata.org/grapher/gdp-per-capita-worldbank?tab=line&country=~IND

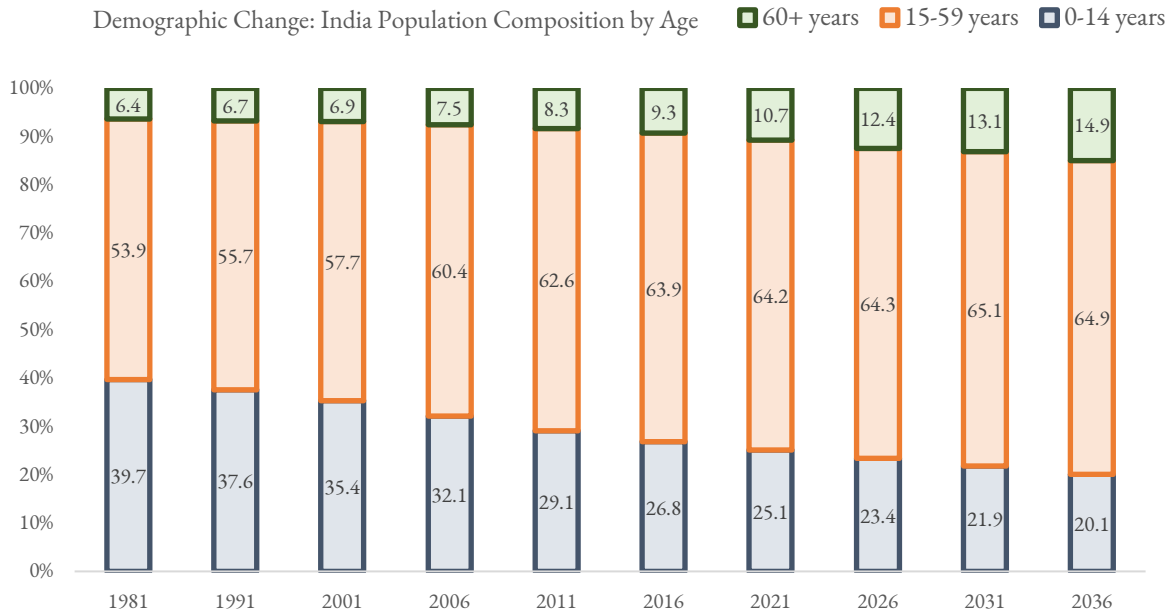
2.2. Growing Population and Changing Demographic Profile

The growing population and changing demographic profile have significant impact on boosting the medical device sector. India is a vast country with a population of over 1.45 billion. With the large population, the demand for medical devices to cater to diagnostic needs, chronic diseases, and advanced treatment options is also increasing.

Within the huge population, the aging population is also increasing. The elderly population (indicated persons aged 60 and above) was 43.7 million in 1981, which constituted around 6.4% of total population. The elderly population increased over five times, to around 227.44 million by 2023, with a share of about 14.9% in total population (Figure 2). The aging population is, in general, a major driver for medical device demand relating to diagnostics, mobility aids, and chronic disease management (WHO 2015). An aging population often requires continuous care for chronic illnesses, leading to a growing need for medical devices designed to manage these conditions, such as insulin pumps, blood pressure monitors, and wearable health devices (NITI 2024; Sun and Li 2023).

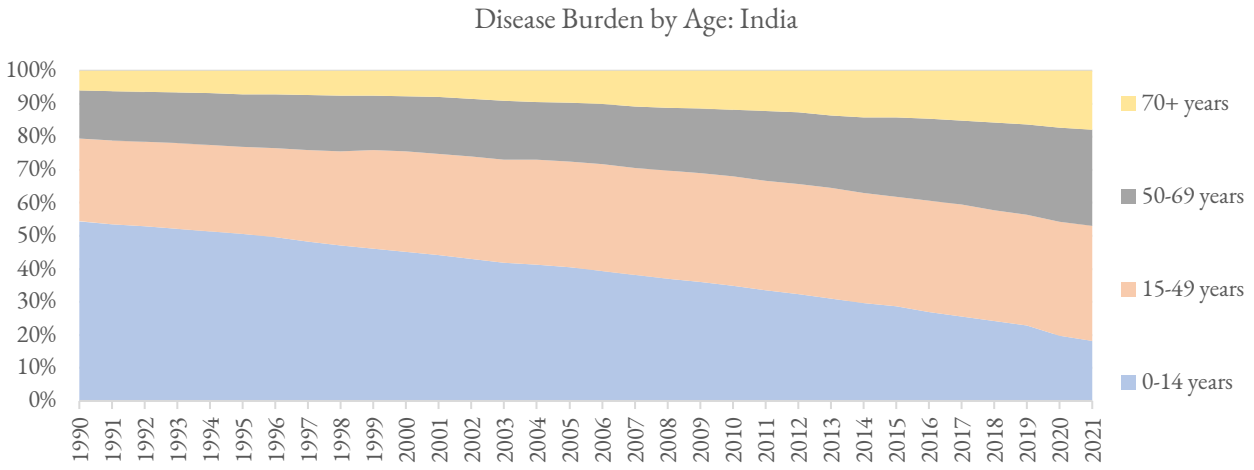
Data also suggests that, in India like the other advanced economies, the burden of disease is on the rise among the elderly / persons aged above 50 years (Figure 3). The prevalence of disease among persons aged 50 years and older in India has more than doubled, from 21.57% of the total disease prevalence in 1990 to 46.97% in 2020 (Figure 3). This requires medical technology intervention to meet such growing demand.

Figure 2: Demographic Change: India Population Composition by Age



Source: RGI, other sources

Figure 3: Rising Disease Prevalence among Elderly: India



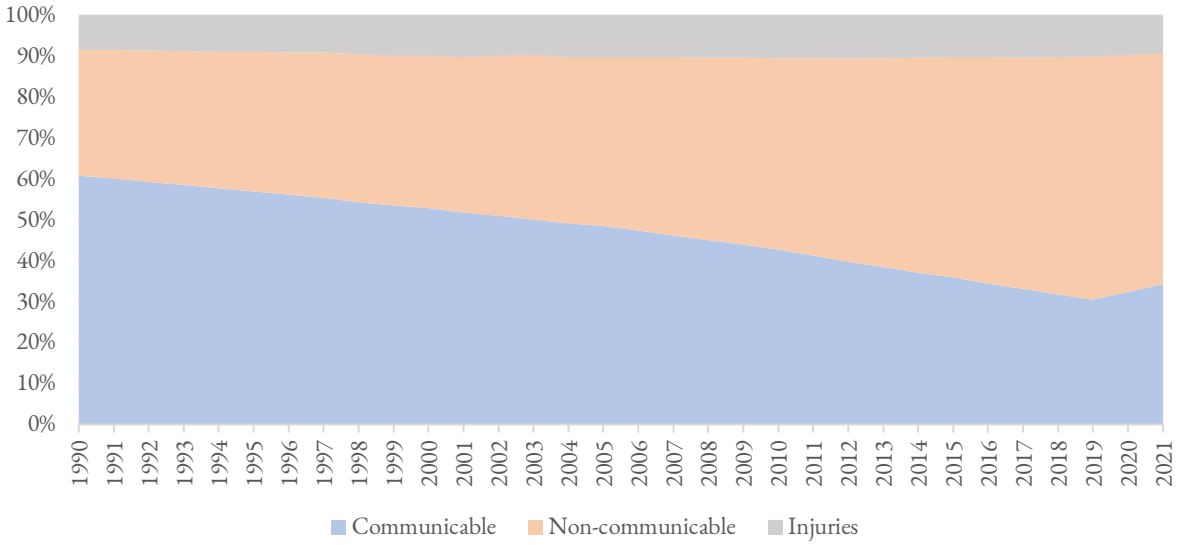
Source: IHME, Global Burden of Disease, 2024; ourworldindata.org

2.3 Changing Burden of Diseases

There is a significant change in the disease burden in India and the world. The disease burden in India, similar to the advanced world, is shifting from communicable diseases (like respiratory infections and TB, maternal health, nutritional deficiencies, HIV/AIDS and STIs, malaria & neglected tropical diseases, enteric infections, neonatal health, other infectious diseases) to non-communicable diseases (NCDs) like cardiovascular diseases, neurological disorders, diabetes and kidney diseases, digestive diseases, liver disease, mental disorders, respiratory diseases, musculoskeletal disorders, cancers, skin diseases, and substance use disorders (Figure 4).

The share of disease burden for NCDs almost doubled, from 30.8% in 1990 to 59.5% in 2019, though it saw a slight decline in recent years due to increase in respiratory disease during Covid-19 (Figure 4). The change in disease pattern from CDs to NCDs requires high medical technology intervention (Sarvestani and Sienko 2018).

Figure 4: Disease Burden for NCD and CDs: India

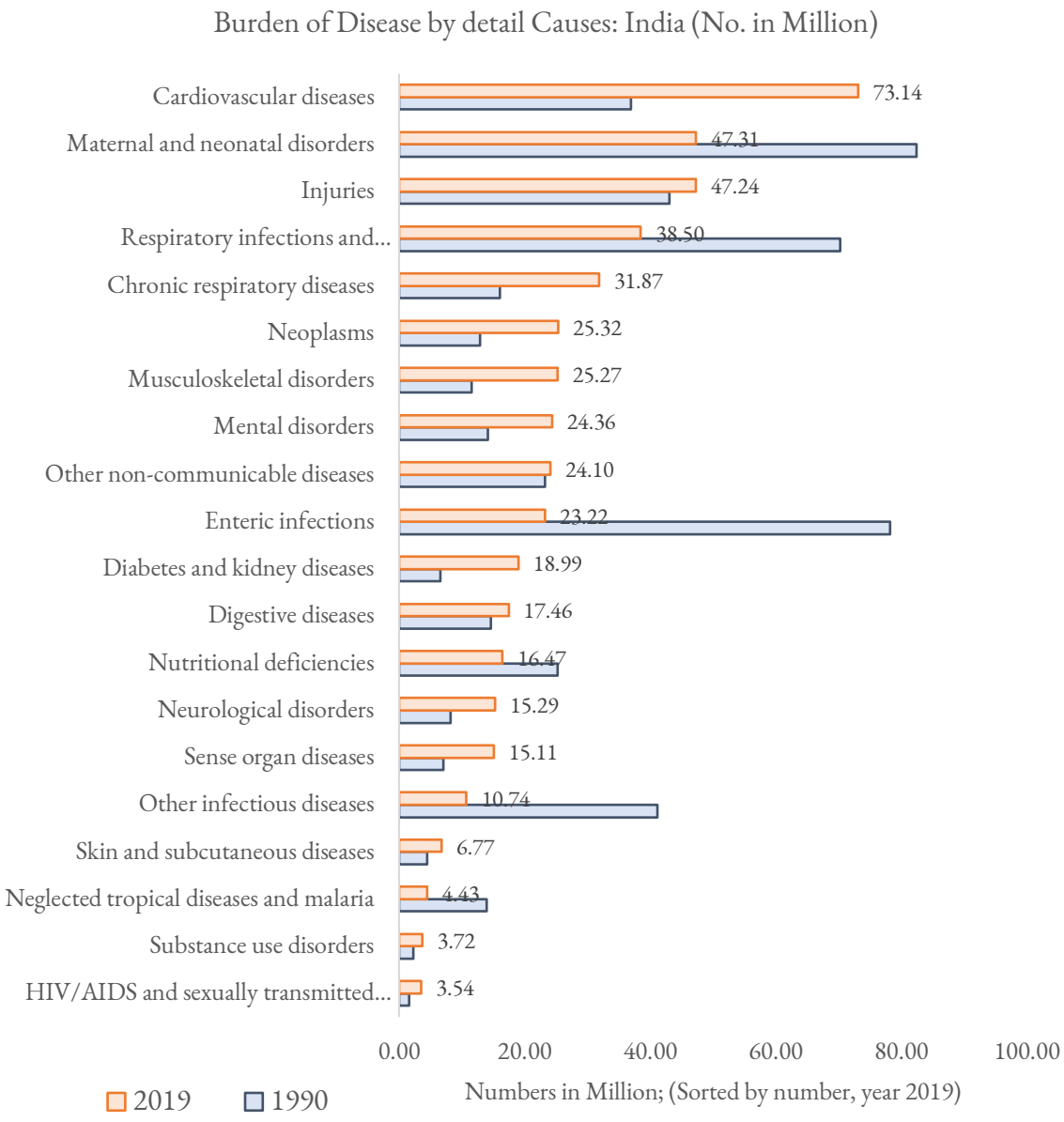


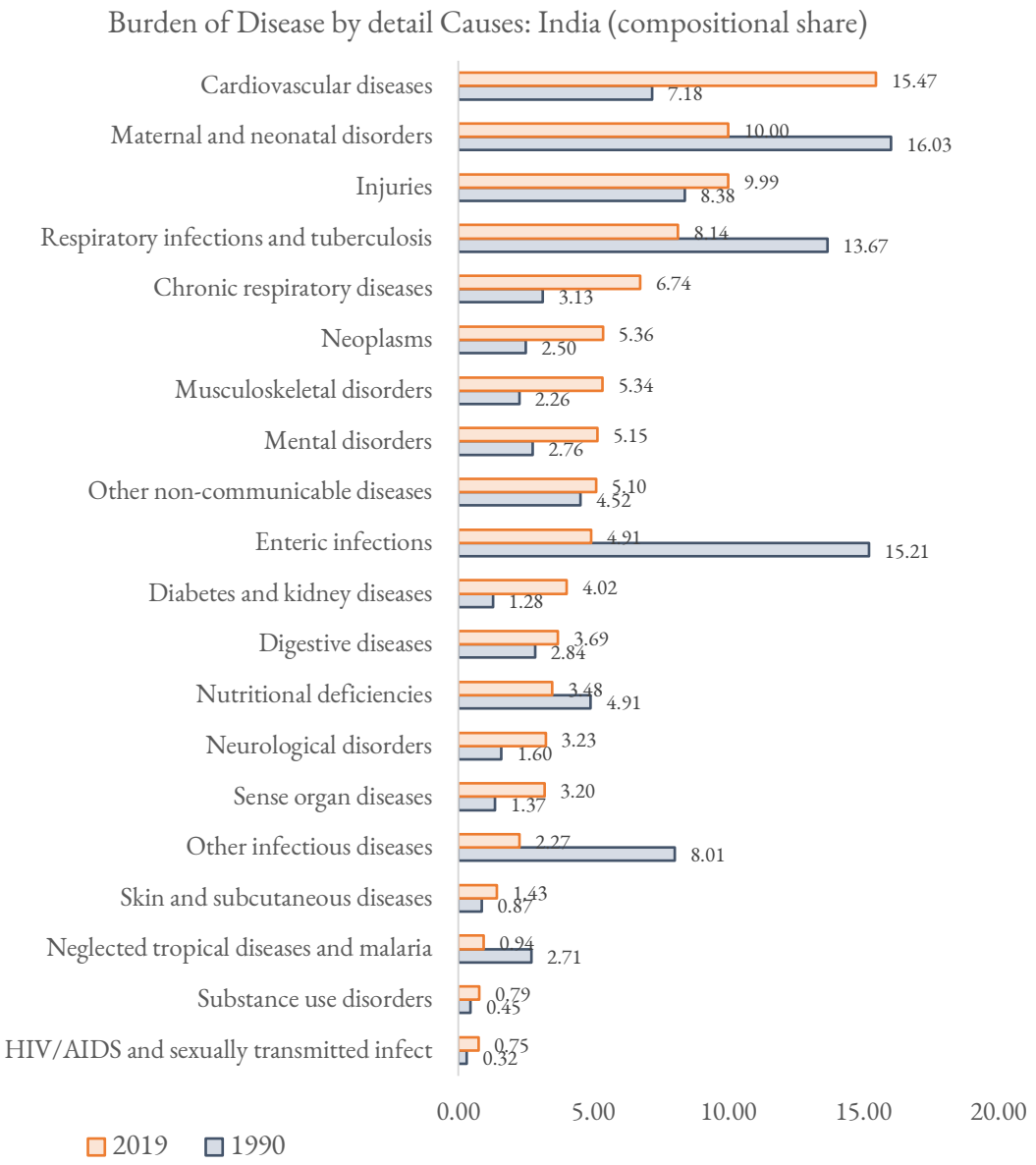
Source: IHME, Global Burden of Disease, 2024; oneworldindata.org

India, over a period of time, is turning into the world's capital of coronary heart disease and diabetes (Figure 5). Around 20% of the world's heart attack deaths are occurring in India (The Economic Times 2024). When compare the disease burden data, it reflects that heart disease alone constitute a major share, around 73 million (15.47%) in 2019 as compared to 37 million (7.18%) in 1990. Other NCDs are also on the rise in India (Figure 5).

With the changing demographic and disease burden profile, the rising prevalence of chronic diseases and aging population would drive the demand for medical device equipment including cardiovascular implants, stents, and laparoscopic instruments, as well as telehealth equipment for remote monitoring of patients. The high growth of NCDs like cardiovascular disease, cancers, kidney disorders, and other NCDs, reported in Figure 5, require more medical technology interventions. In order to meet such growing requirement, the medical device industry will have to prioritise their innovation towards diagnostic and therapeutic devices needed for such diseases.

Figure 5: Disease Burden by detail Causes: India





Source: IHME, Global Burden of Disease, 2024; oneworldindata.org

3. Market Enabling Factors

3.1 Changing Health Policy

Since 2017-18, India has been witnessing a considerable change in health policy, especially relating to how the health services will be delivered to the population, and how they are linked with the medical technology intervention (Hooda 2020). For instance, in 2018, Government of India launched the Ayushman Bharat mission, through which India aspires to upgrade 1.5 million primary health centres to health and wellness centres (HWCs), where testing for mental health, adolescent health, old age care, palliative, eye and dental cares, lung disease, hypertension, diabetes, common cancers, etc. will be made available (Hooda 2020).

As part of this initiative, a list of over 100 test list are prepared which will be conducted at the available government facility at the village-SCs/HWCs/PHC/CHCs/DHs[1]. These testing facilities are related to haematology, clinical pathology, biochemistry, microbiology, serology, and radiology, among others. Similarly, the Government of India introduced annual diagnostic testing for every government employee in 2018; accordingly, a National Essential Diagnostic List was prepared. All these steps are driving the medical device demand.

3.2 Health Spending and Infrastructure

The overall health spending in India has remained almost constant, hovering around 4% of GDP in recent past decade. This spending level is much lower than the global average (Hooda 2015), and even less than in some neighbouring countries like Nepal, Sri Lanka, and Thailand (Appendix 1). However, the health expenditure in per capita terms, both at current and constant prices, shows an increasing trend (Table 1).

Of the total health spending, the share of government spending has also been increasing over time in India, albeit the level of spending is still low. A low level of spending on health has led to inadequate availability of health infrastructure facilities in the country. In India, for instance, the total number of beds (consisting of private sector beds about 11,85,242 beds and public sector about 7,13,986 beds) has on average 1.4 beds per 1000 population, which is significantly lower than the 3.5 beds per 1000 population as per WHO standard (Hooda 2020; Gyani 2023).

Many primary and secondary care level government's facilities in India face a shortfall of doctors, specialists, technicians, beds, and medical equipment. With the increase in overall health expenditure in the country in the time to come, the shortfall in health infrastructure can be addressed (Hooda 2021), which would further boost medical technology demand in the country at hospitals and clinics.

The government health facilities in India face physical and human infrastructure shortage, however, the country has observed a high growth in the number of private medical/hospitals, especially in the post-liberalisation phase (Table 2). Presently, a majority of health services are provided in the private sector (Hooda 2020).

Along with the rise of overall private medical facilities, several diagnostic centres have also come up that exclusively provides diagnostic services. In the post-liberalisation period, the number of diagnostic centres grew with a CAGR of 1.18% between 1990-2010 as compared the 1.11% CAGR of other medical facilities (Table 2; Figure 6). Of the total number of private health facilities, the share of diagnostic centres constituted around 4.4% (Table 2). A rising number of private clinics, hospitals, medicals and diagnostic centres are likely to boost the demand for medical devices in the country, as these are likely to procure medical equipment to deliver better care at their facility.

[1] SC- sub-centre, HWCs- health and wellness centre, PHCs- primary health centre, CHCs- community health centre, DHs- district hospitals

An important aspect of India's health care financing is that the country has observed a significant change in the source of health financing mechanism in the past decade (Table 1). Out of the total health financing, the share of social security expenditure and health insurance expenditure witnessed a sharp rise. The share of social security expenditure increased from 6% in 2013-14 to 8.7% in 2021-22 (Table 1). Similarly, due to the uptake of health insurance by population, the share of private health insurance expenditure increased from 3.4% to 7.4% between 2013-14 and 2021-22 (Table 1), indicating the rising role of health insurance in health financing in India. This may have several implications for patient behaviours and adoption on medical technology, discussed in the next section.

Table 1: Key Health Financing Indicators: India

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Total Health Expenditure (THE) as percent of GDP	4.0	3.9	3.8	3.8	3.3	3.2	3.3	3.7	3.8
Total Health Expenditure (THE) per capita (Rs.) at current prices	3,638	3,826	4,116	4,381	4,297	4,470	4,863	5,436	6,602
Total Health Expenditure (THE) per capita (Rs.) at constant (2011-12) prices	3,174	3,231	3,405	3,503	3,333	3,314	3,516	3,752	4,205
Current Health Expenditures (CHE) as percent of THE	93.0	93.4	93.7	92.8	88.5	90.6	90.5	89.7	87.3
Government Health Expenditure (GHE) as percent of THE	28.6	29.0	30.6	32.4	40.8	40.6	41.4	42.8	48
Out of Pocket Expenditures (OOPE) as percent of THE	64.2	62.6	60.6	58.7	48.8	48.2	47.1	44.4	39.4
Social Security Expenditure on health as per cent of THE	6.0	5.7	6.3	7.3	9.0	9.6	9.3	8.6	8.7
Private Health Insurance Expenditures as percent of THE	3.4	3.7	4.2	4.7	5.8	6.6	7.0	7.3	7.4
External/ Donor Funding for health as per cent of THE	0.3	0.7	0.7	0.6	0.5	0.4	0.5	0.7	1.1

Source: NHA, GoI. https://nhsrcindia.org/sites/default/files/2024-09/NHA%202021-22.pdf

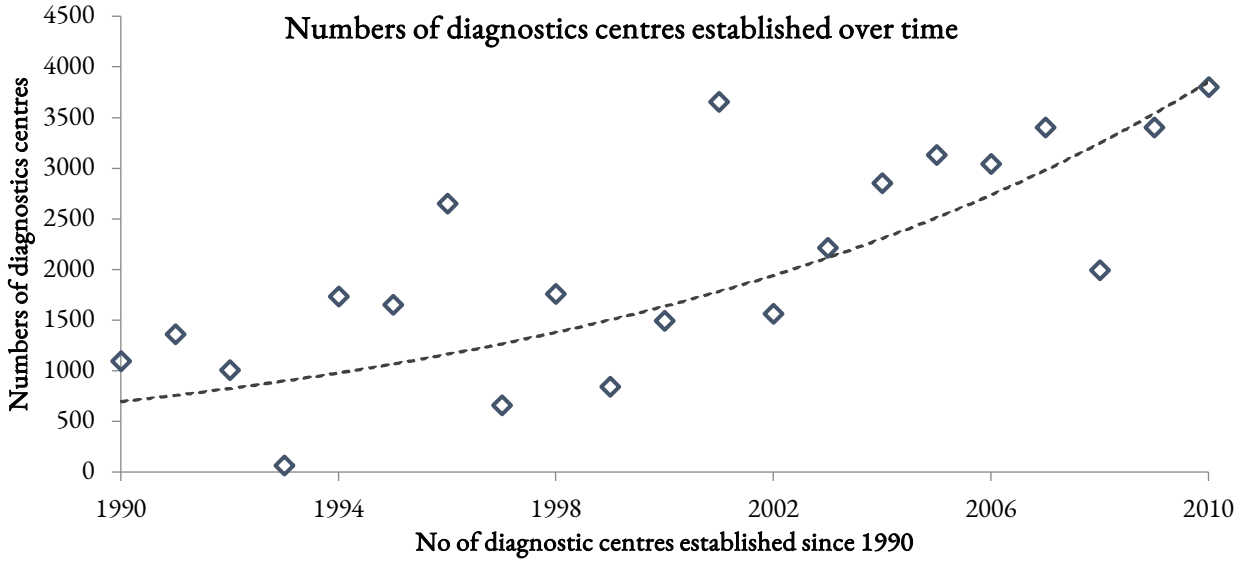
Table 2: Growth and Structure of Private Healthcare Enterprise in India across Segments

Segments	1905-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010	Total entities	CAGR	% dist. total
Hospital	187	11	1284	4332	8123	13973	52240	80265	1.13	7.8
Medical	331	2342	2539	19630	42847	137144	368517	576027	1.12	55.6
Dental	42	0	201	73	1747	7841	31805	42052	1.16	4.1

Ayurvedic	504	449	1796	6866	9812	29662	27767	76891	1.08	7.4
Unani	0	512	477	202	61	6187	9346	16837	1.06	1.6
Homeopathic	0	23	765	4709	11150	34000	64748	115760	1.16	11.2
Nursing	0	0	2366	1360	1130	13712	23663	42231	1.07	4.1
Diagnostic centres	0	0	32	707	2342	13215	29056	45805	1.18	4.4
Others	0	0	1239	1053	2591	5688	12931	23856	1.07	2.3
Residential	289	90	42	429	127	1233	4232	6521	1.05	0.6
Social	0	1	0	388	800	2270	5783	9252	1.10	0.9
Total	1353	3428	10741	39749	80730	264925	630088	1035497	1.11	100

Note: Total enterprises established during the time period. Total entities are higher than cumulative add up from 1905-1950 to 2001-2010, as it also includes number of entities for the year 2010-11.
Source: NSS 67th round

Figure 6: Number of Diagnostic Centre in India established in Post-Liberalisation Period



Source: Same as Table-2

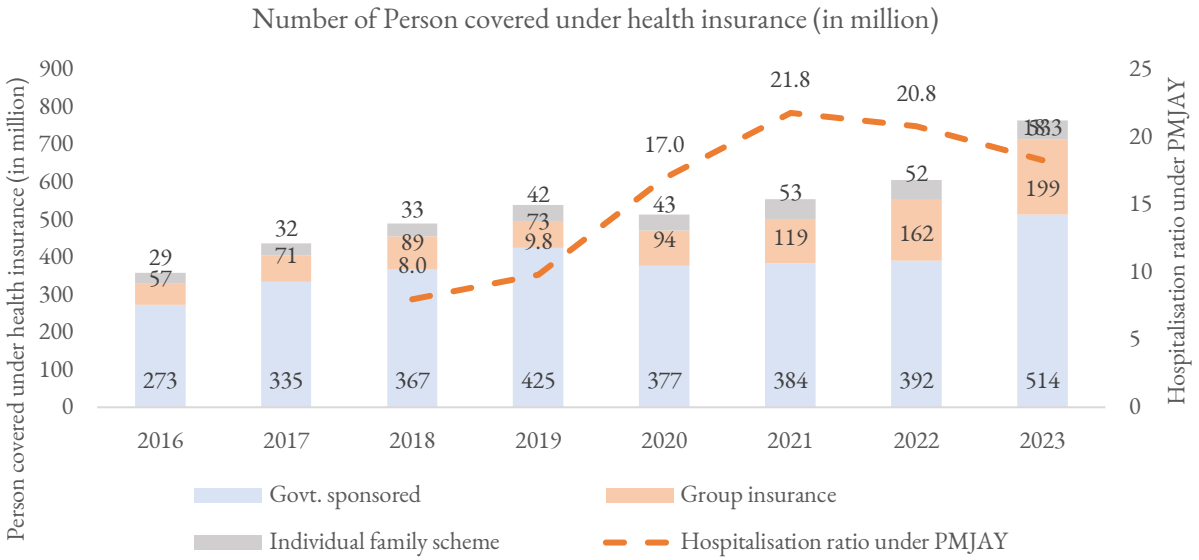
3.3 Health Insurance

As discussed, the role of health insurance is increasing in financing health care in India. This is also reflected with the rising coverage of population under health insurance. The population coverage under private (group and individual family scheme) health insurance increased from 86 million persons in 2016 to 252 million persons in 2023. With the launch of Ayushman Bharat PMJAY scheme in 2018, the persons covered under government-sponsored schemes also increased substantially (by almost double), from 273 million person in 2016 to 514 million person in 2023 (Figure 7), suggesting a substantial increase of population coverage under health insurance.

With the increase in population under insurance protection, people have a high tendency for reporting for hospitalisation (Figure 7). For instance, the hospitalisation ratio under PMJAY was just

8% (ratio of hospitalisation to total population coverage under government funded health insurance schemes) in the initial year 2018-19 of the scheme launch. The hospitalisation ratio under PMJAY more than doubled, to around 18% in 2023 (Figure 7). This indicates that a substantial increase in the number of insured patients seeking medical care, thereby boosting the demand for medical devices. (With the increase in hospitalisation, patients going through diagnostics also increase, as discussed in the subsequent section.)

Figure 7: Population Coverage under Health Insurance



Source: National Health Profile and PMJAY websites.

3.4 Hospitalisation Prevalence Boosting Diagnostic Services

In addition to the insurance, several other factors including patient awareness might boost the prevalence of hospitalisation. Figure-8 (Part-A) shows a significant rise in number of hospitalisation cases, from 14 million in 1995-96 to around 43 million in 2017-18. The increase in hospitalisation cases was much sharper among urban (from 9.5 to 29.4 million cases) than rural (from 4.6 to 13.7 million cases) residents.

If one looks at the hospitalisation prevalence rate, measured through hospitalisation cases as a share of total estimated population in the respective NSSO rounds, it shows a rising trend from 1.67% in 1995-96 to about 3.78% in 2017-18 (Figure 8, Part-B). The prevalence rate of ailment reporting also shows rising trends over the last two decades (Figure 8, Part-C). The rising prevalence of hospitalisation and ailment reporting are expected to boost the medical device industry, because with the increase in hospitalisation cases, the number of persons receiving medical services (like X-ray / ECG scans, as well as other diagnostic tests) is likely to increase, as reported in Figure 9.

Figure 8: Rise in Hospitalisation cases in India

Source: NSS Health Rounds, various years.

Our analysis corroborates that among patients who were hospitalised, a large number go through X-ray/ECG/scan as well as other diagnostic tests. The estimates from unit-level data of various health rounds of NSSO suggest that almost two-thirds of hospitalised cases received X-ray/ECG/Scan services, and more than three-fourths received other diagnostic tests. The share of receiving such diagnostics has been increasing between 2004-05 to 2017-18 (Figure 9).

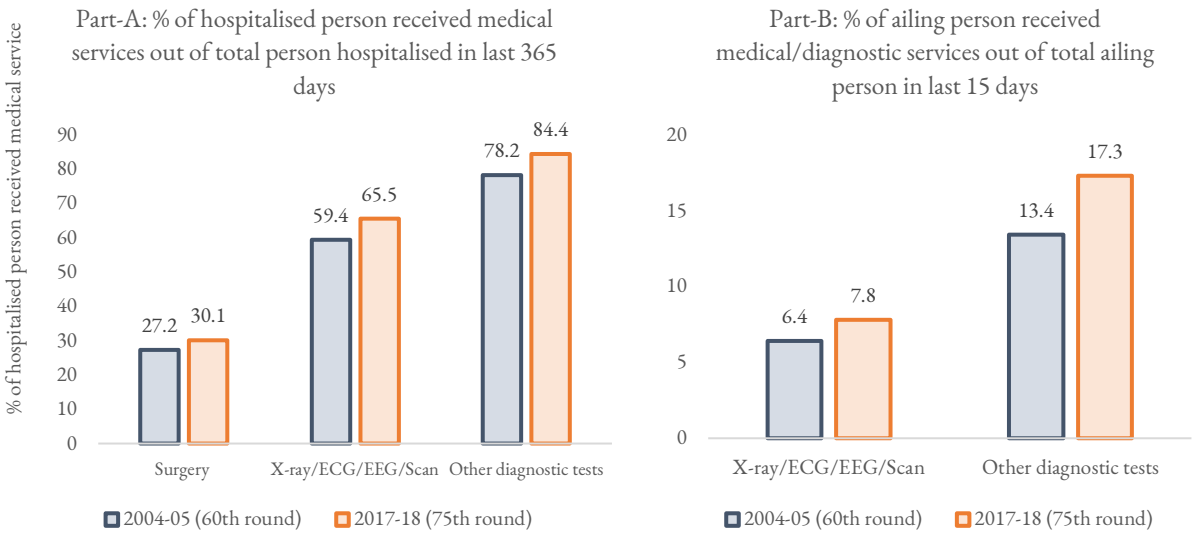
This is true for persons receiving outpatient care as well. Though, for patients receiving treatment for minor ailments, adoption of medical technology intervention is not as high as was the case of hospitalisation, diagnostic intervention are increasing in such cases as well. For instance, percentage of ailing persons who received a diagnostic test service out of total ailing persons increased from 13.4% in 2004 to 17.3% in 2018 (Figure 9, Part-B). Similarly, the percentage of hospitalised persons who received diagnostic test service out of total hospitalised persons increased from 78.2% in 2004 to 84.4%

in 2018 (Figure 9, Part-A). This indicates that demand for medical technology intervention would increase with the rise in both IPD (in-patient) and OPD (out-patient) cases.

Figure-9 also reflect the rising number of surgeries in the country, possibly both general and minimally invasive nature, upon hospitalisation. The rise of minimally invasive surgery and general surgery segments could be significant factor contributing to the growth of medical device.

The rise in health-seeking behaviour and preferences of persons seeking diagnostic tests suggest a potential role of medical device industry in the times to come. As discussed, the emerging role of insurance-based systems is going to add significantly in influencing such behaviours and preferences.

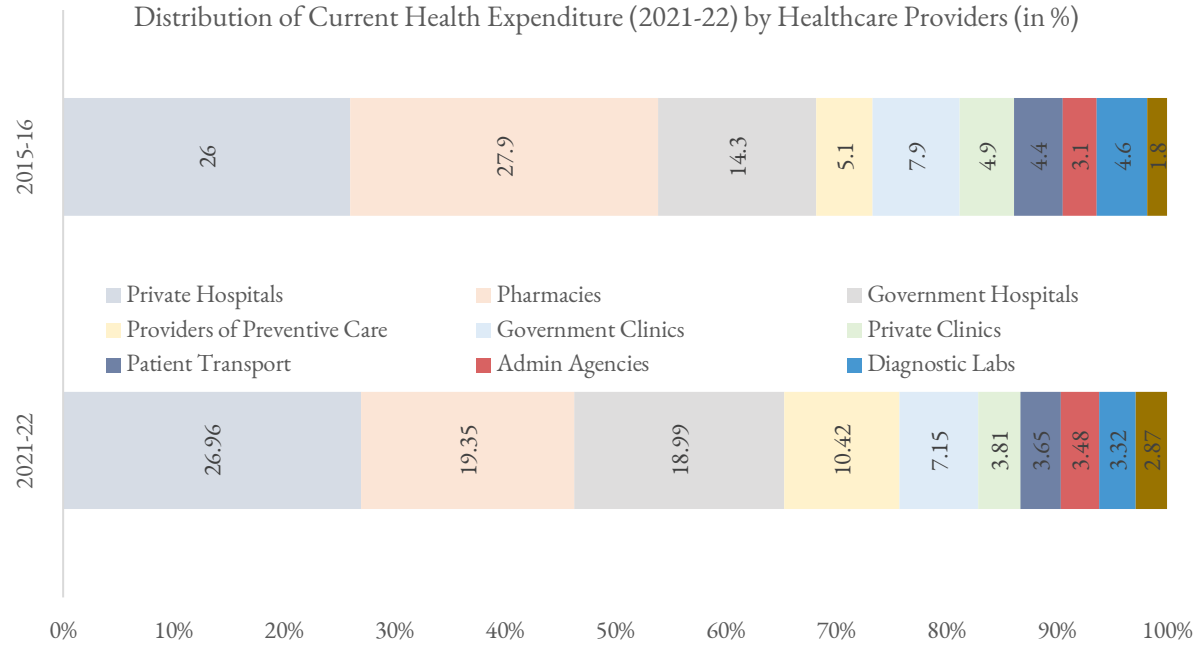
Figure 9: Share of hospitalised and ailing persons received medical/diagnostic services



Source: NSS Health Rounds, various years. Based on sample hospitalisation cases.

The rising number of outpatient and inpatient visits for various surgical procedures and treatments to hospitals, clinics, and others services, as reported above, support the dominance of hospitals/clinics segments in overall health financing in the country. Figure-10 reflects the dominance of public and private hospitals/clinics/providers in overall financing. In addition, the health expenditure of medical and diagnostic / laboratory services providers was around Rs. 26,238 crore, and that of Patient Transport and Emergency Rescue providers was around Rs. 28,906 crore in 2021-22 (NHA 2021-22). This is a significant amount that is directly linked with medical devices equipment and ambulances.

Figure 10: Distribution of Current Health Expenditure by Healthcare Providers (in %)



Source: NHA, various years.

3.5 Medical Tourism

With the growing medical facilities, coupled with the cost-effective care in the country when compared with other advanced countries, medical tourism has witnessed tremendous growth in India. The number of medical tourists witnessed high growth prior to COVID period, with a setback in COVID years. The number of tourists started rising again, and reached even slightly more than pre-pandemic level in 2024.

In 2024, around 7.30 lakh patients visited India from more than 78 countries for seeking medical care (mainly for cancer, cosmetic, cardiovascular, orthopedic, neurology, dental fertility/IVF treatments, wellness and others) – compared to just 1.1 lakh in 2009 (Figure 11). In general, the demand for services like cosmetic surgery, orthopedics, fertility treatments, and organ transplants is contributing significantly to the growth of India's medical tourism market (GOI 2022).

Some market research agencies has projected a sustained growth of India's medical tourism industry. It is expected to increase, with a CAGR of 12.3%, from an estimated USD 18.2 billion in 2025 to USD 58.2 billion by 2035 (FMI, n.d.). High growth is particularly driven by India's reputation of delivering high-quality healthcare services at a very low cost when compared with advanced countries, alongside the availability of cutting-edge technology and internationally trained medical professionals in Indian hospitals (FMI, n.d.).

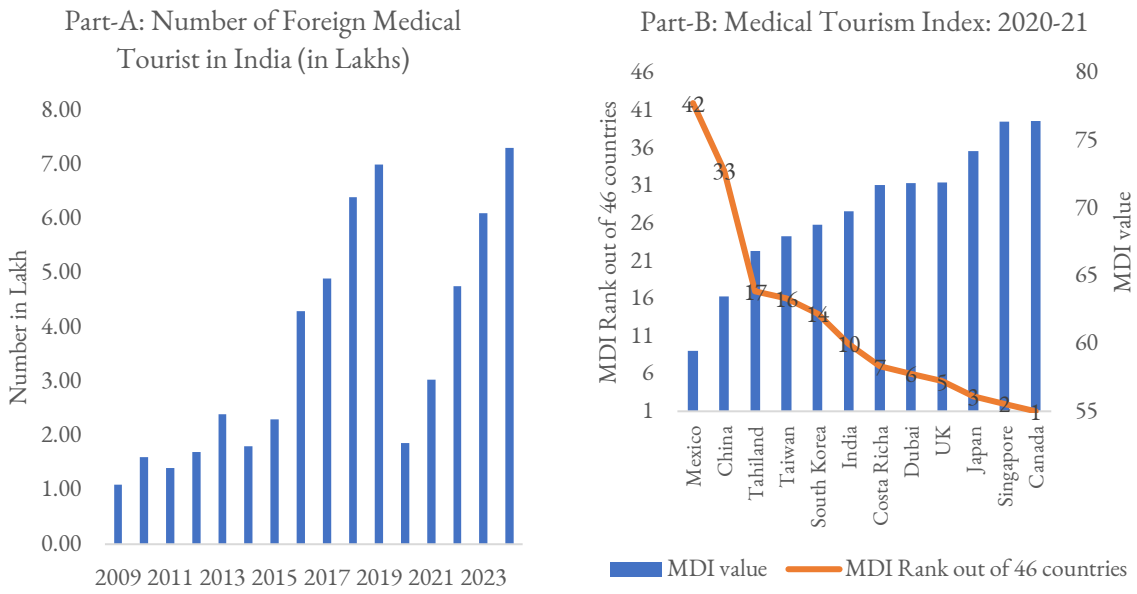
India's comparative cost advantage in delivering high quality care has been acknowledged world-wide (KPMG-FICCI 2014).

- For instance, the cost for heart bypass (in USD) is around 1,30,000 (USA), 11,000 (Thailand), 18,500 (Singapore), 9,000 (Malaysia), 40,900 (U.A.E.), 31,700 (South Korea), 27,000 (Mexico), 24,100 (Costa Rica), while only 7,000 in India.
- Similarly, the cost for heart valve replacement was reported to range from USD 9,000 (in Malaysia) to 1,60,000 (in USA), and 9,500 in India.
- For hip replacement, it ranged from USD 10,000 (Malaysia) to 43,000 (USA), and 7,020 in India.
- For knee replacement, it was reported to range from USD 8,000 (Malaysia) to 40,000 (USA), and 9,200 in India, reflecting that India delivers care at a fraction of cost when compared with other countries.

The International Healthcare Resource Center (IHRC) constructed a Medical Tourism Index (MDI) covering 46 countries, using factors like tourist popularity, medical facility quality, hospital accreditation, healthcare costs, economic stability, and the overall environment of the destination (IHRC 2020). India ranked at 10th place in Medical Tourism Index in 2020-2021 out of 46 major destination countries of the world (Figure 11).

The Ministry of Tourism has recently taken up several initiatives, in a holistic manner, for the promotion of medical tourism in the country (GOI 2022). With the rise in medical tourism, one can expect that it will drive the demand for medical devices at the hospital level. The manufacturers will have to cater to the demand for high quality medical care through developing high technology equipment within the country.

Figure 11: Emerging Trends of Foreign Medical Tourism in India



Source: Part-A: Ministry of Tourism and
https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1987820;
Part-B: Global Healthcare Resources & International Healthcare Resource Center

4. Integration of Medical Device for Domestic Usage

The recent pandemic have significantly accelerated the adoption of medical device equipment in homecare in India, which is reflected from a nation-wise survey on households consumption expenditure (HCE) conducted by Government of India in 2022-23. This HCE survey captures the household's expenditure on purchase of different consumption items including medical equipment used for homecare. The medical equipment segment includes the expenditure on wheelchair, massagers, hearing aids & orthopedic equipment, nebulizer, other medical equipment (like, blood pressure monitoring machine, other remote patient monitoring devices, etc.). We assessed the household expenditure on purchase of medical equipment for domestic use from this consumer expenditure survey round of NSSO 2022-23.

Estimates indicate that households spent about Rs. 2,327 crore on medical equipment for home use (Table 3). When compared to the total expenditure by the central government on medical equipment for its facilities, this figure appears significant. For instance, according to the National Health Account 2021, the central government allocated around Rs. 1,13,019 crore to the health sector, covering general hospitals, defense/railway, and other government-owned facilities (NHA 2021). Of this health budget, about 90% is spent on salaries, 5.36% on purchasing drugs, 2.6% on administrative costs, and the remaining portion on medical equipment for government facilities. Translating this spending on medical equipment into actual figures, it amounts to roughly Rs. 1,514 crore, which is even less than the Rs. 2,327 crore spent by households on purchase of medical equipment for domestic use. Similarly, the state government allocated Rs. 2,03,561 crore for health in 2021, with approximately Rs. 2,728 crore earmarked for medical equipment, underscoring the growing demand for medical equipment at household level.

The analysis of household expenditure on the purchase of medical equipment for domestic use suggests that a significant proportion (around 58.5%) goes to the 'other medical equipment' category (which includes blood pressure monitoring machines), around 15% on nebulizers, 12% on hearing aids and orthopaedic equipment, 9% on massagers, and 6% on wheelchairs. Of the total amount spent by households on purchase of medical equipment, urban households' expenditure constitutes about 56% overall (Table 3); however, rural-urban spending share vary across medical equipment.

Table 3: Household Expenditure on Purchasing of Medical Equipment for Domestic Use during last 365 days: Analysis by type of equipment, 2022-23

	Expenditure Composition by medical equipment items			Rural-Urban Distribution	
	Rural	Urban	Total	Rural	Urban
Wheelchair	6.20	6.11	6.15	44.71	55.29
Massagers	5.84	11.16	8.80	29.45	70.55
Hearing aids & orthopaedic equipment	15.32	9.19	11.91	57.06	42.94
Nebulizers	14.14	15.03	14.64	42.84	57.16
Other medical equipment (blood pressure monitoring machine, etc.)	58.50	58.54	58.52	44.35	55.65
Medical equipment: sub-total (in million & %)	**10322**	**12950**	**23272**	**44.35**	**55.65**

Source: Unit-level data of Consumer Expenditure survey of NSSO 2022-23

A state-level analysis suggests that medical devices are integrated in homecare differently across Indian states, possibly due to differential preference and/or difference in income and disease profiles of states. Therefore, expenditure by households on medical equipment for domestic use differs significant across states. The composition share of expenditure on blood pressure monitoring machine etc. in Andaman and Nicobar, for instance, is more than 90% (Table 4).

Table 4: Household Expenditure on purchasing of medical equipment for domestic use: Analysis by Type of Equipment across Indian States, 2022-23

States	Wheelchair	Massagers	Hearing aids & orthopaedic equipment	Nebulizer	Other medical equipment (blood pressure monitoring machine, etc.)
Ladakh	1.08	1.28	34.08	37.56	26.00
Telangana	8.96	5.28	18.35	33.16	34.26
Maharashtra	12.15	14.18	14.50	20.89	38.29
Mizoram	1.93	25.27	14.81	17.78	40.21
Jharkhand	4.47	15.04	27.20	12.83	40.46
Chandigarh	0.11	29.44	13.29	15.49	41.67
Kerala	6.07	2.19	22.39	25.96	43.39
Lakshadweep	7.01	0.00	15.11	33.37	44.52
Meghalaya	0.39	30.81	13.11	3.67	52.02
Madhya Pradesh	1.40	9.55	24.64	11.87	52.54
Uttrakhand	5.73	15.09	18.03	4.65	56.50
Gujarat	9.33	13.70	11.93	7.87	57.18
Karnataka	11.17	9.79	11.58	10.18	57.28
Delhi	1.21	17.50	4.98	19.00	57.31
Tamil Nadu	13.10	6.72	11.96	7.95	60.26
Arunachal Pradesh	0.45	25.94	5.41	7.62	60.57
Nagaland	7.25	20.17	11.73	0.00	60.85
DNH & DD	0.00	11.98	18.30	4.81	64.91
Odisha	0.77	7.77	22.79	3.30	65.38
Jammu & Kashmir	6.15	1.73	15.07	11.66	65.39

Rajasthan	4.93	7.26	9.01	13.19	65.62
Punjab	2.38	17.52	9.55	2.66	67.88
Andhra Pradesh	12.64	1.03	4.98	12.72	68.63
Bihar	6.94	8.44	6.93	8.48	69.20
Tripura	5.07	15.65	4.24	5.18	69.87
Sikkim	0.00	23.89	5.25	0.77	70.08
Chhattisgarh	7.66	3.39	17.86	0.88	70.21
Uttar Pradesh	4.69	6.62	5.63	12.79	70.27
West Bengal	0.98	1.77	9.07	17.73	70.45
Haryana	1.03	8.19	6.92	7.96	75.90
Manipur	1.97	3.45	8.22	10.10	76.26
Assam	5.14	3.88	7.87	2.71	80.40
Goa	0.00	5.97	12.98	0.00	81.05
Himachal Pradesh	6.72	2.29	3.07	1.04	86.88
Puducherry	0.00	5.58	4.96	1.10	88.36
Andaman and Nicobar	0.00	0.00	3.41	1.43	95.16
All (India)	6.15	8.80	11.91	14.64	58.51

Source: Unit-level data of Consumer Expenditure Survey (CES) of NSSO 2022-23.
(CES captures such information during last 365 days on the day of survey.)

4.1 Role of e-Commerce Platforms

Our estimates from consumer expenditure survey of NSSO 2022-23 suggest that a large number of households, around 4.15 crore households, purchased medical equipment for domestic use (both online and offline mode) in 2022-23. Of the total households who purchased medical equipment for their domestic use, about 1.81 crore households belong to rural area and 2.34 crore were urban households.

The COVID-19 pandemic accelerated the adoption of digitalisation by firms (Deloitte, n.d.; TCS, 2020). Households are also shifting towards online purchasing of different manufacturing items, including medical devices, as reported in Table-5. e-commerce platforms are making the purchase easier, efficient, and convenient for users of medical devices (Deloitte, n.d.). Estimates from NSSO 2022-23 suggest that, of the total 4.15 crore households, around 11,59,350 (2.79%) households purchased medical equipment through online mode in 2022-23. A majority of them were from urban areas (79%, or 9,19,600 households) and around 21% (2,39,750 households) were from rural areas. The tendency of purchasing of medical equipment through online mode was higher among high-income households than low-income households (Table 5 and Figure 12).

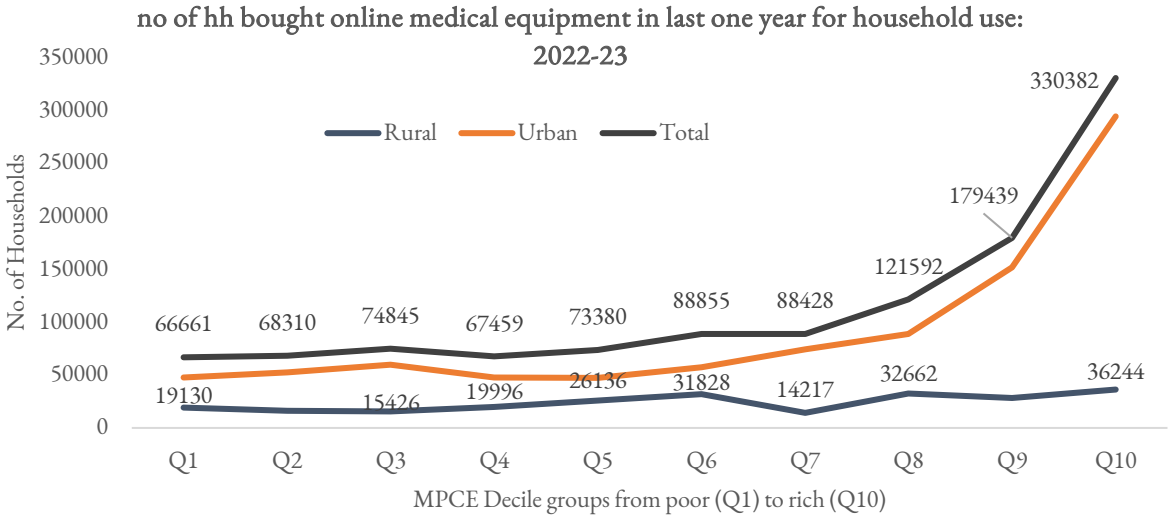
Table 5: Number of Households purchased online medical equipment by MPCE: 2022-23

MPCE	Number of HH purchased online medical equipment in last 365 days			Distribution of HH by MPCE			Composition of HH by R-U	
	rural	urban	Total	rural	urban	Total	rural	urban
Poor-Q1	35272	99699	134971	14.7	10.8	11.6	26.1	73.9
Near Poor-Q2	35421	106883	142304	14.8	11.6	12.3	24.9	75.1
Middle-Q3	57965	104270	162235	24.2	11.3	14.0	35.7	64.3
Upper Middle-Q4	46879	163141	210020	19.6	17.7	18.1	22.3	77.7
Rich-Q5	64213	445608	509821	26.8	48.5	44.0	12.6	87.4
Total	239750	919600	1159350	100	100	100	20.7	79.3

Source: Unit-level data of Consumer Expenditure survey of NSSO 2022-23

When examining the distribution of households that purchased online medical equipment by MPCE (Monthly Per Capita Consumption Expenditure) decile class, particularly to assess whether income influences this behavior, we observe that the number of households buying medical equipment online increases as the MPCE of households rises. This trend is particularly pronounced more among urban households compared to rural ones (Figure 12). This may be due to urban households being more aware of the availability and utility of such products, as well as having a greater ability to spend on them.

Figure 12: Number of Household bought online medical equipment in last one year for domestic use: 2022-23



Source: Unit-level data of Consumer Expenditure survey of NSSO 2022-23.

5. Technological Factors

In the aftermath of the Covid-19 pandemic, stakeholders like doctors, patients and others emphasized the need for digital technologies to provide seamless care to patients, leading to a gradual adoption of digital practices. India's health-tech business is projected to grow at a CAGR of 39% (IBEF 2023). With government initiatives such as the Ayushman Bharat Digital Mission, National Health Digital Mission, and e-Sanjeevani, India is unlocking its potential in the digital health space.

Emerging technologies like telehealth and remote patient monitoring devices are enabling healthcare providers to monitor patients from a distance. Additionally, wearable and smartphone technologies are driving a transformative shift in patient observation and personalized care, with medical devices, electronic medical records, wearables, and telehealth gaining popularity for household use. As electronic medical records, wearables, smartphones, and telehealth gain popularity, these devices are also becoming more common in households usage. Wearables, equipped with sensors such as accelerometers and optics, are emerging as valuable tools for diagnostics and therapy, facilitating a move towards a more decentralized and personalized healthcare system. Both healthcare

providers and patients are increasingly adopting these technologies for continuous monitoring beyond clinical settings.

Smartphones, once solely for communication, have evolved into essential tools for health monitoring, utilizing internet of thing (IoT) connectivity to support a seamless transition to a digital and interconnected healthcare system (Wall et.al. 2023). This suggests that the demand for emerging medical equipment is expanding beyond traditional medical settings and hospitals to digital technologies such as electronic health records, wearable devices, mobile health applications, and other forms of digital health technology. Additionally, research and development activities in these areas are gaining momentum across the globe (Hooda 2025).

In the next sections, we will discuss the supply-side factors, including (i) public procurement platform for boosting the domestic manufacturing, (ii) reform in Medical Device Regulation (MDR) for improving global acceptability of our medical device equipment via quality enhancement, and (iii) government policy initiatives that promote medical device manufacturing specifically through the special incentive package scheme, foreign direct invest, Make-in-India, Medical Device Parks, and PLI (production-linked incentive scheme) for the medical device sector.

6. Public Procurement Platform for Reshaping the Medical Device Sector

The Government of India launched the e-commerce platform 'Government eMarketplace' (GeM) as part of the Make in India initiative. GeM allows companies to register and list their products on the platform.

With the issuance of the Public Procurement Order (PPO) 2017 (MeitY 2020), the government has taken steps to prioritize domestic manufacturers in public procurement of medical devices for hospitals under the Central Government. State governments have also been instructed to follow this approach. Under the order, around 19 medical devices and 135 In-vitro diagnostics (IVD) products were designated, with local manufacturers receiving the first preference (GoI 2024a). A recent PPO displayed a list of 592 medical device items and invited local manufacturer to register for providing these equipment at GeM platform (GOI, 2024b).

Hospitals are required to purchase these items from domestic manufacturers, even if they are priced higher. The PPO and GeM initiatives are expected to assist local medical device manufacturers by providing them with a platform for procurement, which is likely to contribute to the growth of the industry. It is reported that India has around 700-800 medical device manufacturers, of which 300 are domestic manufactures, they are expected to contribute significantly at such platform (AiMeD, n.d.).

7. Medical Device Regulation 2017

Following the risk-based classification system for medical devices in line with the Global Harmonization Task Force guidelines, the Central Drugs Standard Control Organisation (CDSCO) introduced a Medical Devices Rule in 2017 (GOI 2017). This system categorizes medical devices into four classes based on the potential risk associated with their use: Class A (low risk), Class B (low-moderate risk), Class C (moderate-high risk), and Class D (high risk). This international classification has been adopted especially to improve the quality of manufactured products and increase the global acceptability of medical device equipment manufactured in the country (GoI, 2017).

8. Policy Promoting Medical Device Manufacturing

In 2012, government of India announced a special incentive package scheme for medical device-related MSME, SEZ, and non-SEZ units to boost domestic manufacturing of medical devices (especially relating to electronic equipment) (Hooda 2025). Since then, India has implemented several measures to support the sector's growth.

For instance, in 2015, the medical device sector was designated as a "sunrise sector" under the Make in India initiative (Hooda 2025). The government has streamlined the regulatory processes, and has worked towards promoting the research development and innovation especially to build a strong manufacturing ecosystem. India allowed 100% foreign direct investment (FDI) in medical devices, which is crucial for attracting international players and enabling them to tap into India's growing healthcare market (Hooda 2025).

Our report on medical device industry (Hooda 2025) suggests that Indian medical device sector face several challenges viz., inadequate logistic infrastructure, constraints in the local supply chain, high financing costs, unreliable power supply, limited design capabilities, and low investment in R&D. To address such issues, Government of India announced a policy to establish four Medical Device Parks for strengthening and developing a robust manufacturing ecosystem for MD in the domestic market, and reducing manufacturing costs up to 50%. Each park also includes raw material consolidated facility, standard testing facility to enhance product quality, export / import facilitation centres, regulatory & engineering services, and academia-industry linkages (including patent use).

India introduced the Production Linked Incentive (PLI) scheme to encourage domestic manufacturing of medical devices, with an increased emphasis on research and development. The PLI cover 4 major segments of medical device: cancer care/radiotherapy; radiology, imaging, and nuclear imaging devices; anaesthetics, cardio-respiratory, and renal care; and all implants. Further, to simplify the import process for medical devices and equipment, the government introduced the National Single Window System (NSWS). In April 2023, the Government of India approved the National Medical Devices Policy 2023, aimed at fostering industry growth through initiatives such as developing infrastructure, supporting R&D and innovation, attracting investment, streamlining regulations, building human resources, and enhancing industry awareness and positioning.

With continued government support, India's medical device market is poised for significant growth. While a comprehensive analysis is required to assess the full impact of these initiatives on the sector's development, an overview of India's domestic medical device manufacturing, market size, and the import/export dynamics across various categories offers useful insights.

Our comparative analysis on market size suggests that India's share in the global medical device market hovered around 2%. If one goes by medical device components, it reflects that India's medical device market is fairly distributed among diagnostic imaging, orthopaedic devices, ophthalmic devices, cardiology devices, IVD, and other categories, whereas the world market itself is concentrated around in-vitro diagnostic, cardio-related, and 'other' medical devices (Table 6)

Table 6: Medical devices market size in 2022-23: Global and India Comparison (Rs.Cr.)

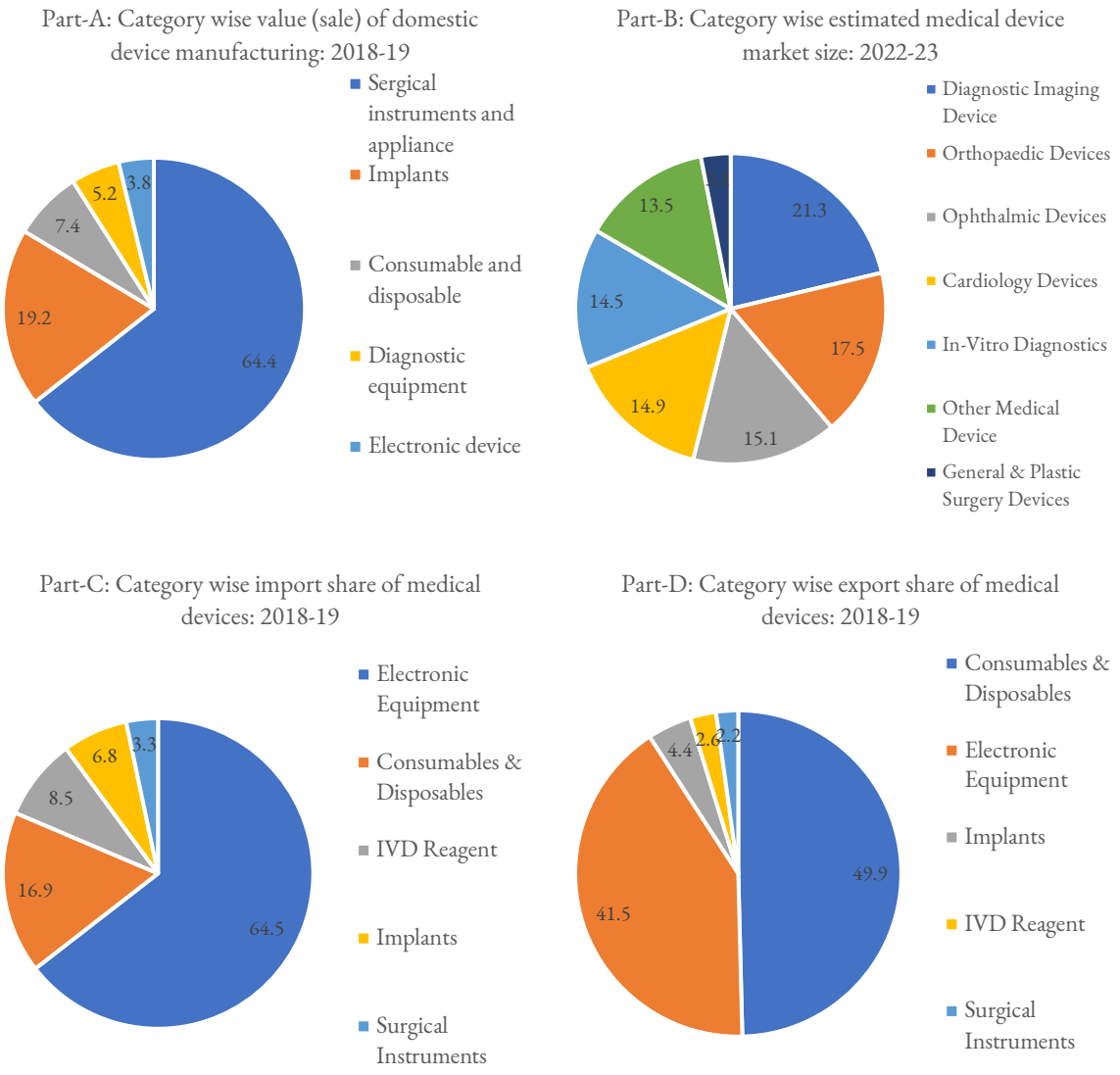
Items-group	Global	Global composition	India	India Composition	India's share in World
In-Vitro Diagnostics	6,28,619.64	14.56	12,883.20	14.55	2.049
Cardiology Devices	4,51,702.63	10.46	13,240.16	14.95	2.931
Orthopaedic Devices	3,04,563.68	7.06	15,499.16	17.50	5.089
Diagnostic Imaging Devices	2,56,858.80	5.95	18,835.52	21.27	7.333
Ophthalmic Devices	2,23,620.14	5.18	13,399.49	15.13	5.992
General & Plastic Surgery Devices	133328.24	3.09	2,737.68	3.09	2.053
Other Medical Devices	23,18,145.11	53.70	11,976.79	13.52	0.517
Total	43,16,838.24	100.00	88,572.00	100.00	2.052

Source: KIHT, GLOBEXIM, 2022-23

As reported in Figure 13 (Part-B), India's domestic demand for medical devices is fairly distributed around various items (listed in Table 6). However, domestic manufacturing in India is primarily focused on producing surgical instruments, appliances, implants, and consumables (Figure 13, Part-A). The country has minimal production in diagnostic and electronic devices, despite the higher domestic needs. As a result, India is highly depended on imports of electronic medical devices, which account for about 64.5% of total medical device imports (Part-C).

Given that India primarily manufactures low-tech equipment, it is not surprising that exports are mainly concentrated in consumables, disposables, and low-end electronic equipment category (Part-D). This reflects that India mainly produces low-tech segment medical equipment, which pushes the country to depend more import on high-tech segments equipment. This is a cause of serious concern for a country like India where this sector have high potential to grow.

Figure 13: Category-Wise Value of Manufacturing, Market Size, Import and Export: India



Source: Part A, C and D - Hooda (2025); Part-B- KIHT (2023)

9. Key Challenges

9.1 Expensive Medical Technology for End-Users

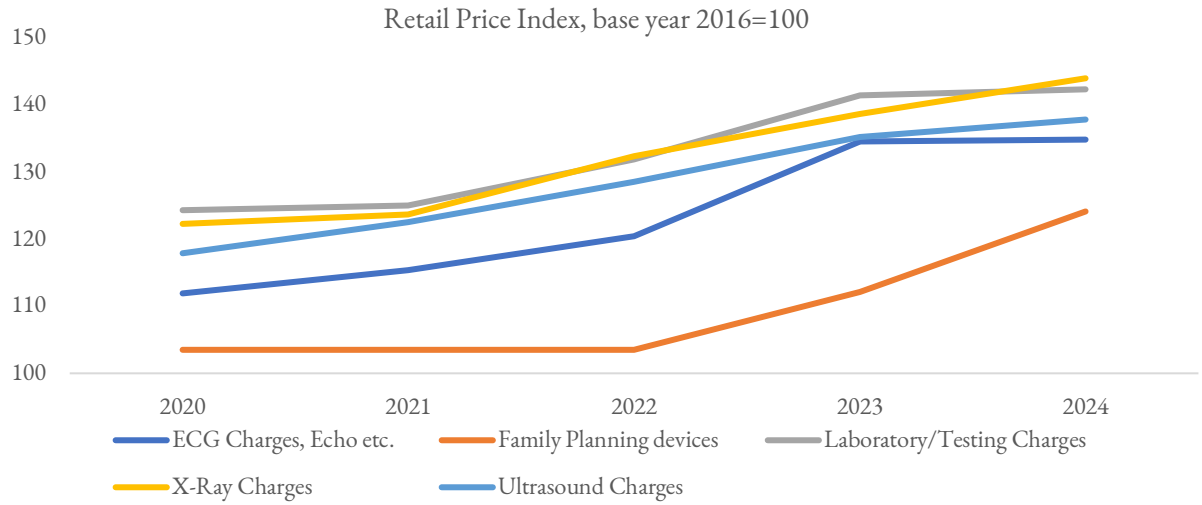
Despite several enabling factors for sector growth, and while the medical device sector of India produces a wide range of medical equipment ranging from consumables to implantable devices, the sector's growth has tilted towards producing low-tech equipment in the disposables segment (catheters, perfusion sets, cannulas, feeding tubes, needles, syringes) and implants segment (such as cardiac stents, intraocular lenses, and orthopedic implants). This is because the sector is highly capital-intensive, requiring high R&D and skilled personnel to adapt emerging and new technologies (Hooda 2025).

India remains heavily reliant on imports, especially for high-tech equipment that requires specialized skills. The high-tech and advanced medical technologies are often expensive (Awasthi and

Stanick 2021), thereby forcing the medical providers to charge higher prices to end-users. Our data analysis of the Retail Price Index (RPI) of different diagnostic testing charges support this argument.

The RPI data suggest a sharp rise in diagnostics test charges in the country. The growth rate (CAGR) in charges for different diagnostic usage ranges between 14% to 20% from 2020 to 2024, taking RPI in 2016 as the base year (Figure 14). The charges grew 20.4 percent for ECGs-ECO followed by, family planning device (19.9%), X-ray (17.7%), ultrasound (16.9%) and laboratory test (14.5%), indicating that use of medical technology is becoming expensive in India.

Figure 14: Increase in ECG/ECO, Laboratory Test, X-ray and Ultrasound Charges in India

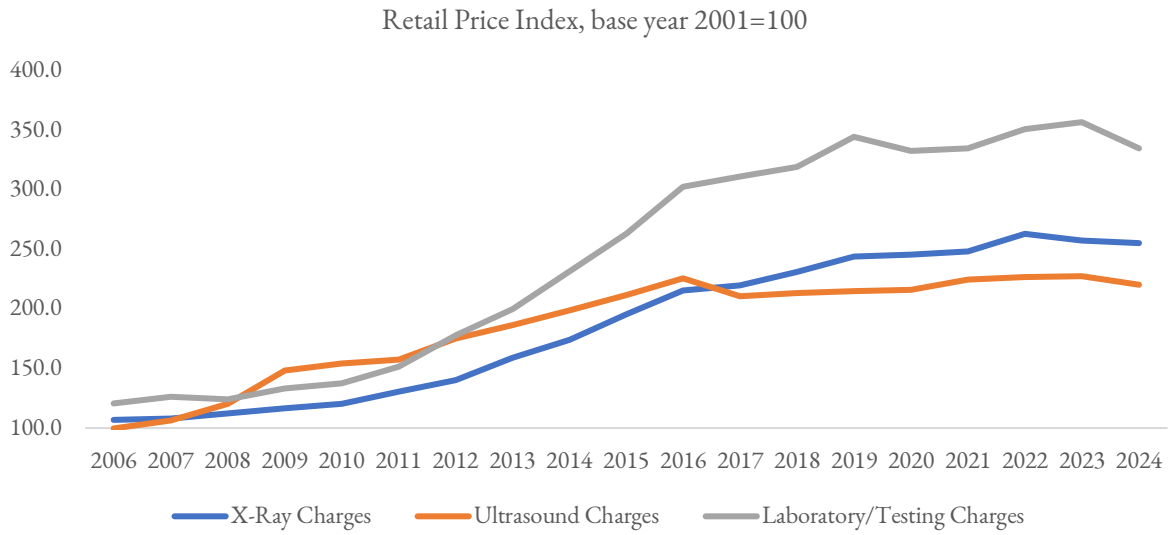


Source: Labour Bureau, Government of India, Retail Price Series.

When examining the long-term trends in diagnostic test charges at constant prices (with a base of 2001=100), it is evident that over the past two decades, the charges for various tests have increased significantly (Figure 15). The average value of RPI increased from 106.9 to 225.1 for x-ray, from 106.6 to 220.2 for ultrasound, and from 120.6 to 334.7 for laboratory testing charge between 2006 to 2024. The average growth rate for these charges has ranged from 120% to 177% between 2006 and 2024. Diagnostic test charges saw an increase of around 177.4%, followed by X-ray charges (138.8%) and ultrasound charges (120.96%).

This substantial rise in charges indicates that use of medical technology in India is becoming increasingly expensive. The escalating costs of medical technology are likely to drive up the overall cost of healthcare, contributing to higher out-of-pocket (OOP) spending. In this context, manufacturers (especially via boosting local manufacturing) and regulators have a crucial role to play.

Figure 15: Increase in Laboratory test, X-ray and Ultrasound Charges in India at Constant Price



Source: Labour Bureau, Government of India, Retail Price Series.

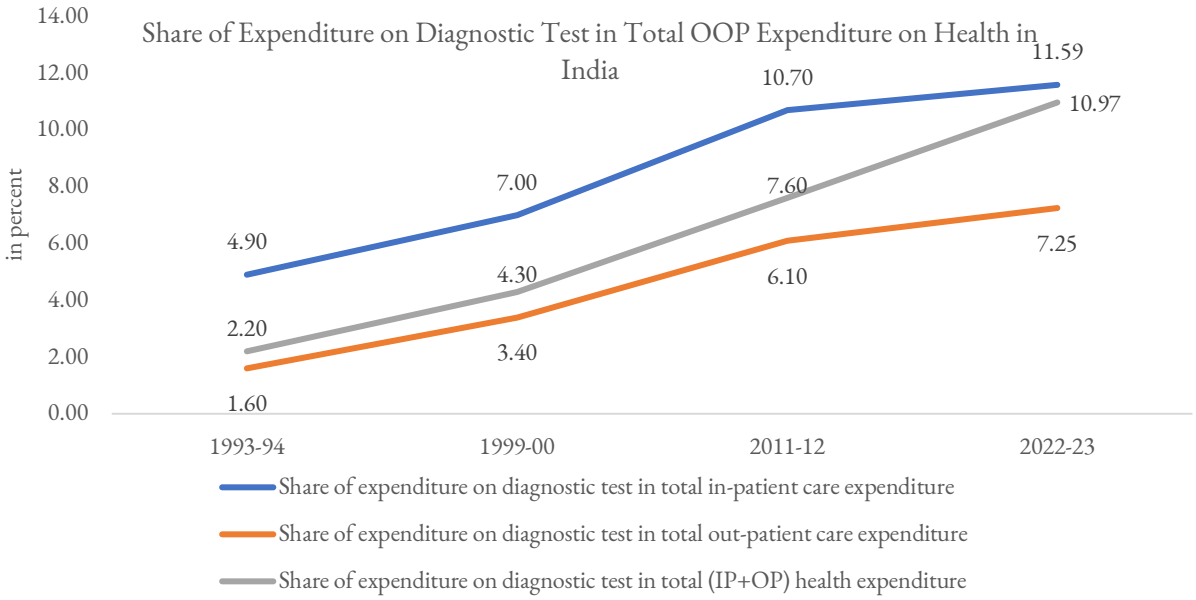
9.2 End-Users' Expenditure on Diagnostic Test

As reported earlier, the number of patients receiving OPD and IPD services is growing rapidly across different NSS health rounds in the country. This increase in OPD and IPD cases may lead to higher spending of households on diagnostic tests, unless these tests become cost-effective and/or covered under government-sponsored insurance schemes.

High out-of-pocket (OOP) health expenditure often pushes millions of people below the poverty line and contributes to catastrophic expenses, resulting in significant indebtedness for many households (Hooda 2017). In various NSSO consumption expenditure surveys (CES), OOP expenditure is reported for hospitalization (in-patient) over the past 365 days and non-hospitalization (out-patient) over the last 30 days. In CES schedule, OOP health expenditure is typically categorized into five areas: medicine, doctor's/surgeon's fees, diagnostic tests (such as X-rays, ECGs, and pathological tests), hospital and nursing home charges, and other medical expenses. Historically, spending on medicine accounted for about 70% of the total, while spending on diagnostic tests was minimal. However, our analysis from several successive CES rounds of NSSO shows a steady increase in OOP expenditure on diagnostic tests over time.

We observed a significant rise in OOP expenditure for diagnostic tests in both in-patient (IPD) and out-patient (OPD) care (Figure 16). The growth rate in the share of OOP expenditure on diagnostic tests in total out-patient care expenditure was particularly striking, rising from 1.6% to 7.25% during the study period. The share of OOP spending on diagnostic tests increased more than fourfold, from 1.6% in 1993-94 to 7.25% in 2022-23. Similarly, the share of diagnostic test expenditure in total in-patient care costs rose from 4.9% in 1993-94 to 11.59% in 2022-23, a more than two-and-a-half time increase over the study period (Figure 16).

Figure 16: Share of Expenditure on Diagnostic Test in Total OOP Spending on Health in India

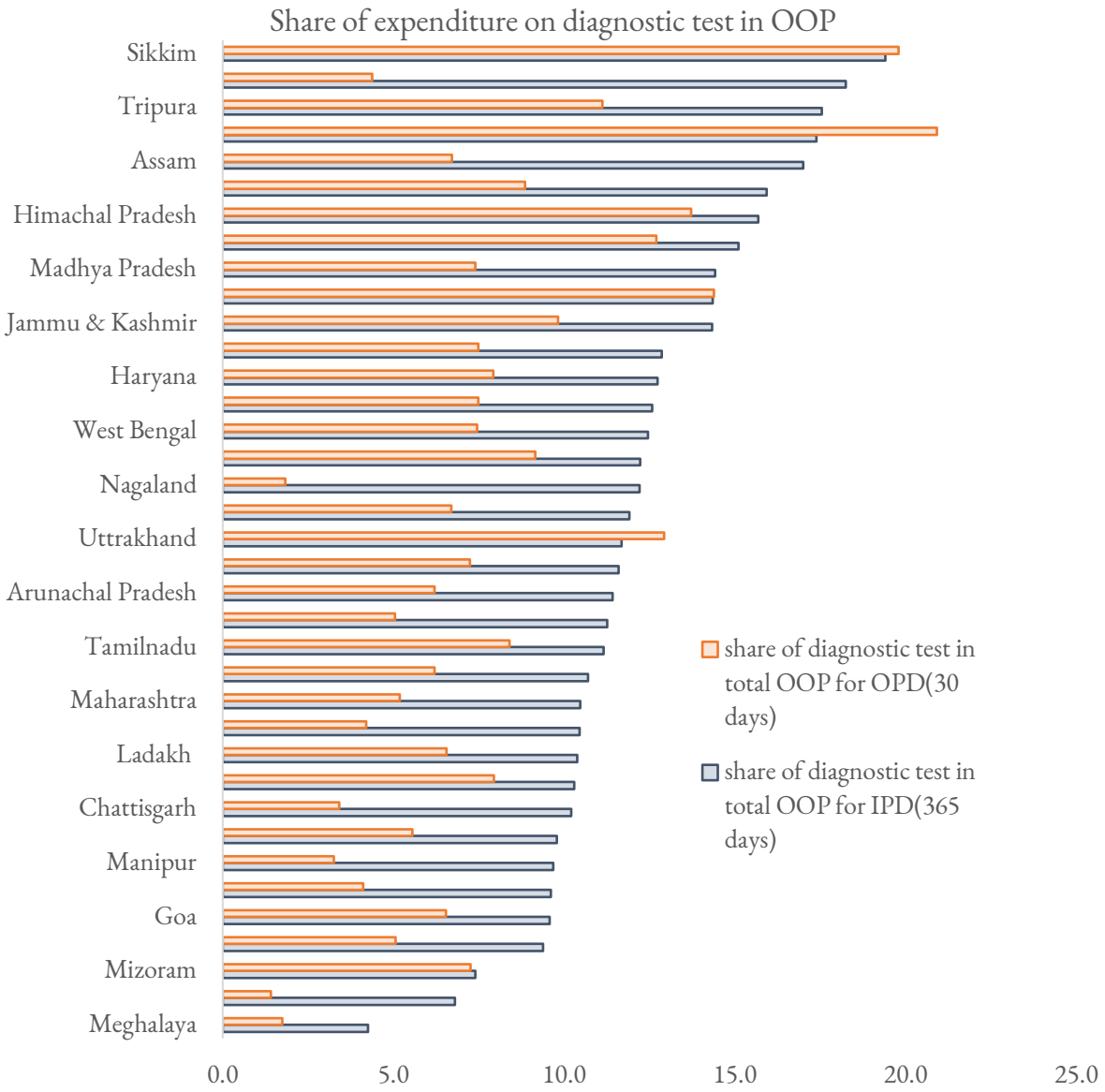


Source: Unit-level data of Consumer Expenditure survey of NSSO (various rounds)

As reported in Figure-16, in 2022-23, share of expenditure on diagnostic test in total OOP health expenditure at national level was around 10.97%. For IPD and OPD, this share was 11.59% and 7.25% respectively. The state-level diagnostic test spending share for IPD and OPD, however, vary significantly. In some states, spending share on diagnostic services for both IPD and OPD cases, exceeded even 20%, almost double the national averages 11.59% and 7.25% respectively. (Figure 17).

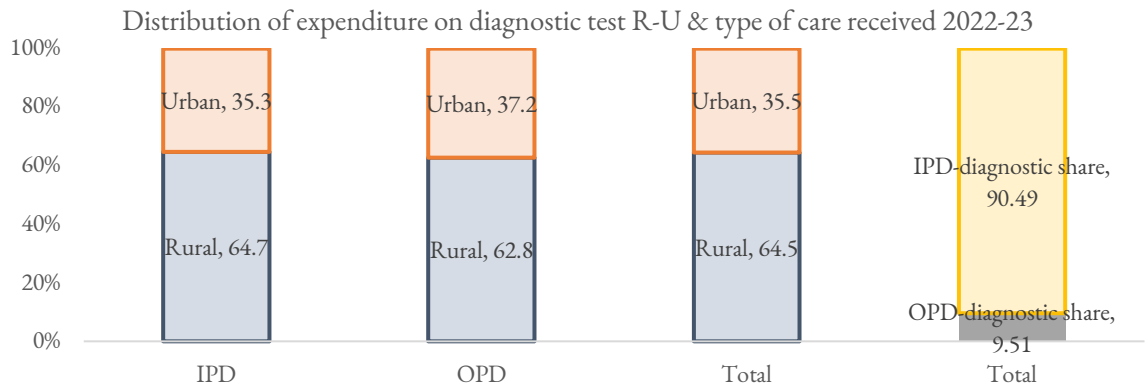
Of the total out-of-pocket (OOP) expenditure on diagnostic services for both IPD and OPD, we found that in-patient (IPD) services accounted for a significant share of approximately 90.49%, while the remaining 9.51% was spent on OPD diagnostic services (Figure 18). A major share of expenditure on diagnostic tests is primarily borne by rural patients, which account around 64.5% of the total OOP expenditure on diagnostic tests in 2022-23, compared to 35% by urban residents (Figure 18).

Figure 17: Share of OOP Expenditure on Diagnostic Test in Total OOP across States 2022-23



Source: NSS Consumption Expenditure Survey Round, 2022-23

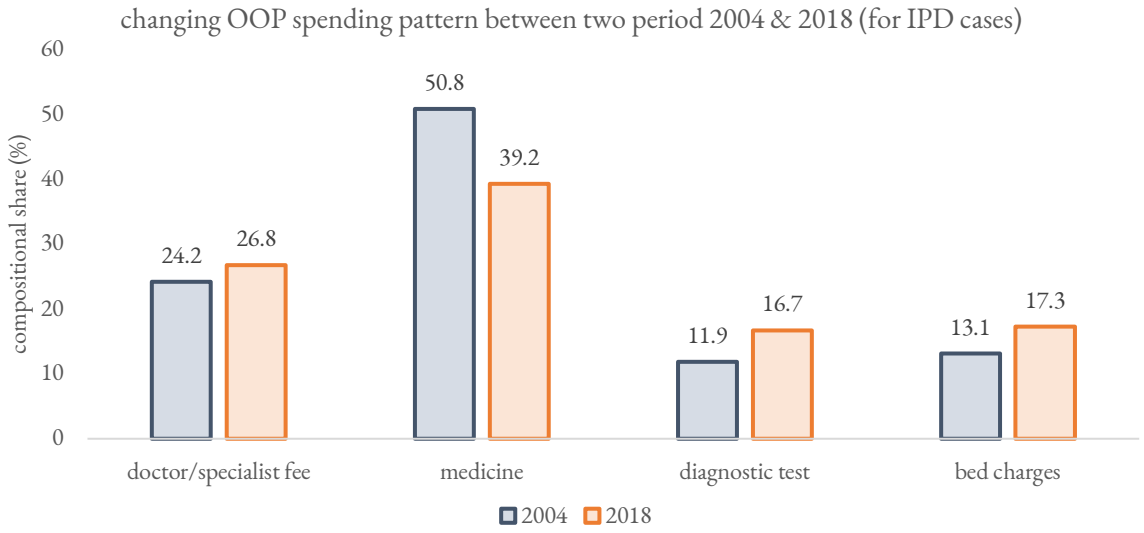
Figure 18: Share of OOP Spending on Diagnostic Care by Rural-Urban 2022-23



Source: Unit-level data of Consumer Expenditure survey of NSSO 2022-23

With the increase in charges of diagnostic testing for end users, OOP spending for diagnostic tests has risen between the two health rounds of NSS 2004 and 2018. The compositional share of the spending on diagnostic test increased from 11.9% to 16.7% between these two rounds. The spending share for doctor fee and bed charges also see a rising pattern, though by a smaller percentage than spending of diagnostic tests, whereas the share of OOP spending on medicine declined from 50.8% to 39.2% during this time period (Figure 19).

Figure 19: Changing OOP spending pattern between NSS Health Rounds 2004 & 2018



Source: NSS health round 2004 and 2018

9.3 Skill Gap Challenge

The medical device sector is highly critical and different from other consumable goods. It encompasses lifesaving equipment, and its usage require a reasonable ecosystem of high-skilled personnel and technicians. However, in reality, India face a skill gap in this sector. The data from Global Health Observatory shows that density of biomedical engineers and technicians per 1000 population in India *decreased* from 0.32 in 2014 to 0.23 in 2017 (WHO, 2018).

Such type of personnel are essential for ensuring innovative technological solutions and ensuring correct development of medical device equipment (James and Jaiswal 2020). The shortage of such technicians and biomedical engineers will have implications for growth and development of this industry. For instance, as reported in James and Jaiswal (2020), globally around 30% of sophisticated equipment remained unused, while those in operation had 25-35% equipment face downtime because of weak capacity to maintain and use these equipment (World Bank, 2003).

10. Conclusion

This paper outlines the socio-economic, market, technological, and policy factors that could drive the growth of India's medical device industry. It also highlights the key challenges and issues the sector is currently facing. The study observed that while India has made significant strides toward developing its local medical device manufacturing, it remains heavily dependent on imports (Hooda 2025; Datta and Sakthivel, 2019). Indian medical device manufacturing explored a wide range of medical equipment ranging from consumables to implantable devices. However, sector growth has been primarily focused on low-tech equipment in disposable segments such as catheters, perfusion sets, cannulas, feeding tubes, needles, syringes and implants segment like cardiac stents, intraocular lenses and orthopedic implants (CMRSD 2023; Hooda 2025).

This biasedness may be because of high capital-intensive requirement of the sector, which require continued investment in R&D, regulatory improvements, infrastructure development and skilled personnel to adapt to emerging technologies (GoI 2020; IBEF 2024). In short, despite several enabling factors for the sector's growth, India mainly produces medical equipment within the low-tech segment, from consumables to implantable devices. As a result, the country remains reliant on imports for expensive high-tech equipment.

Our analysis also indicates that medical equipment costs are rising, leading to higher diagnostic test fees for end-users, which in turn contribute to a significant out-of-pocket payment burden on households for using diagnostic services. This underscores the need to boost domestic manufacturing of high-tech medical devices and calls for a greater regulatory role in controlling the rising prices of medical equipment.

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Appendix 1: Health Expenditure: A Global Comparison

	Current Health Expenditure (CHE) as % Gross Domestic Product (GDP)		Current Health Expenditure (CHE) per Capita in US$		Social Health Insurance (SHI) as % of Current Health Expenditure (CHE)	
	2003	2019	2003	2019	2003	2019
USA	15	17	5732	10546	19	24
Germany	10	12	3153	5489	69	70
Canada	9	11	2535	5104	2	1
France	10	11	3006	4509	75	71
Australia	8	10	2227	5529	NA	NA
Brazil	8	10	253	868	NA	1
UK	8	10	2789	4259	NA	NA
China	4	5	57	539	15	39
Mexico	6	5	412	550	28	27
Malaysia	3	4	142	419	1	1
Nepal	4	4	11	54	NA	2
Sri Lanka	4	4	41	155	1	1
Thailand	3	4	76	288	6	9
India	4	3	22	61	2	6
Indonesia	2	3	26	118	3	25
Pakistan	2	3	14	36	1	1
Bangladesh	2	2	10	48	NA	NA

Source: https://apps.who.int/nha/database/ViewData/Indicators/en

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IPPR

Trump's Tariff War 2.0: Implications and Potential Opportunities

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Abstract

This article explores the ramifications and possible opportunities arising from the tariff war initiated by President Donald J. Trump during his second term in office. Trump's aggressive trade restrictions target several of the United States' trading partners, including China, Mexico, and Canada, invoking legislative provisions such as the International Emergency Economic Powers Act of 1977. The article provides an analysis of the historical context of US tariff policies, the timeline of recent tariff actions, and the rationale behind these measures, including national security and reducing trade deficits. The implications of these tariffs on global economic stability, investor confidence, and commodity prices are examined, along with strategic retaliation by affected countries. The paper also highlights India's position in this evolving trade landscape, identifying sectors with high potential to boost exports to the US market. This paper suggests that India could benefit from redirecting trade flows and enhancing its role in global value chains through appropriate policies.

Keywords: Tariffs, International Trade, Reciprocal Tariffs, Trump, Trade Flows, India

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1. Introduction

Donald J. Trump became the 47th president of the United States (US) on 20th January 2025. All along his campaign trail, he had been vocal about his ideas of imposing trade restrictions to 'make America great again'. Less than three months into his second term as President, he has announced, revised, paused, and implemented a deluge of tariff actions. His tariff actions in this first round culminated in what he has termed the 'Liberation Day', imposing what he calls 'reciprocal' tariffs on most of US' trading partners.

Trump's actions have put the world on tenterhooks. These actions have plunged the global economic system, already marred by geopolitical fragmentation, into further uncertainty. While these are still early days to decisively comment on the final outcomes and implications for the global economic order, in this article, we attempt to analyse the intentions, actions taken so far, and its possible implications for the global economy, including India.

2. Background

In the years following the US Civil War, the United States had adopted a largely protectionist tariff regime. High import tariffs served as a key source of revenue to pay off the enormous war debts incurred. However, after the 1940s, US tariff legislation had been overhauled to promote freer trade by reducing tariff barriers.

The constitutional power to impose tariffs and regulate trade lies with the US congress. However, over time, Congress has delegated discretionary powers to the US President in this regard (Table 1), particularly in matters related to foreign policy and national security. Overall, the US has in the past seven decades more or less followed a low-tariff policy, being a part of multilateral agreements such as the GATT (1947) and later WTO (1995), as well as encouraging imports from developing countries through its Generalised System of Preferences (GSP) (Casey, 2025).

Table 1: US legislation delegating discretionary powers on tariffs

Legislation	Year of enactment	Summary
Section 232, Trade Expansion Act	1962	Authorises tariffs or restrictions on imports that threaten national security.
Section 201, Trade Act	1974	Allows temporary tariffs or quotas if a surge in imports causes or threatens serious injury to U.S. industry.
Section 301, Trade Act	1974	Permits action (including tariffs) against foreign trade practices deemed unfair or discriminatory.

International Emergency Economic Powers Act (IEEPA)	1977	Grants the President power to regulate imports/exports during national emergencies affecting U.S. security or economy.

Source: William (2020)

The current Trump administration invoked the International Emergency Economic Powers Act, 1977 (IEEPA), to initiate a series of tariff regulations. A timeline of the major actions taken is listed in Table 2.

On February 1, 2025, executive orders were issued imposing tariffs of 10%–25% on imports from China, Canada, and Mexico. However, tariffs on Canada and Mexico were paused, while China promptly initiated retaliatory measures.

Following the Liberation Day announcements on April 2nd, 2025, Canada and Mexico were not subjected to reciprocal tariffs. However, 25% duties under Section 232 of the Trade Expansion Act of 1962, effective March 4, 2025, were upheld—citing national security and fentanyl trafficking concerns. Steel, aluminium, and auto/auto parts were exempted from the new tariffs. Under the United States–Mexico–Canada Agreement (USMCA) several goods were exempt provided they met the rules of origin requirements under the agreement. Some specific goods such as copper, pharmaceuticals, semiconductors, lumber, and critical minerals etc. which are not available in the US were also exempt from reciprocal tariffs. Russia, Cuba, North Korea, and Belarus were excluded, likely due to existing sanctions.

A universal 10% import tariff was imposed on April 5, 2025. Country-specific tariffs, effective April 9, 2025, aim to address trade imbalances via 'discounted' rates for partner countries. The 10% baseline applies to the UK, Singapore, Brazil, Australia, Saudi Arabia, and many others. Higher tariffs target countries with large trade surpluses with the US: China faces a total 54% import tax, India 26%, the EU 20%, Cambodia 49% (the highest on any country other than China), Vietnam 46%, Bangladesh 37%, and Japan 24%, among others—spanning over 200 countries.

Soon after the tariffs went into effect on April 9, the US announced a 90-day pause on the reciprocal tariffs, excluding those levied on China. Import duties on China were further escalated to 125% by the US, whereas universal baseline tariffs of 10% on all foreign goods were enforced. Following this, China retaliated with a 125% tariff on all US imported goods. The rapid retaliations triggered significant instability and tensions in global markets, prompting the world's two largest economies to consider de-escalatory measures.

Talks in Geneva began on April 22, 2025, where top U.S. and Chinese officials convened. After initial discussions, they reached an agreement on a 90-day tariff reprieve during their second meeting on May 12. The bilateral tariff truce resulted in the US reducing tariffs from a mounting 145% to 30% on Chinese imports, and China simultaneously cut tariffs on US import from 125% to 10%. A mutual suspension on any new duties or non-tariff retaliation was also agreed upon.

The trade deal with China followed shortly after the U.S. signed a deal with the UK, which preserved the existing 10% tariff rate. Despite the modest terms, the deal has been widely seen as a step toward bolstering and strengthening both economies. There is hope for a boost in trade, with farmers and manufacturers gaining greater market access in the UK, especially with respect to ethanol and agricultural products like beef. An existing 20% tariff on US beef exports to the UK was agreed to be removed. The UK automotives industry is planned to receive a quota of 100,000 vehicles for its imports to US at 10% tariff rate.

Another conditional agreement is that the UK must protect the steel and aluminium supply chains to the US, ensuring that the supply is not linked to a high-risk country. The US will reciprocate by creating special import quotas for the metal products that UK exports. These quotas will allow a fixed volume of UK metal products to enter the U.S. market at MFN tariff rates (Office of the United States Trade Representative, 2025b).

Table 2: Timeline of the tariff war

Date	Event
January 20, 2025	Trump is sworn into office and announces plans for 25% tariffs on Canada and Mexico from February 1.
January 26, 2025	Trump threatens 25% tariffs on Colombia, leading to a brief trade dispute.
February 1, 2025	Trump signs an executive order imposing tariffs on imports from Mexico (25%), Canada (25%), and China (10%) with effect from February 4.
February 3, 2025	30-day pause on tariffs against Mexico and Canada.
February 4, 2025	China retaliates with tariffs on U.S. goods and an investigation into Google.
February 10, 2025	Trump announces plans to hike steel and aluminium tariffs.
February 13, 2025	Announces plan for reciprocal tariffs.
March 4, 2025	Tariffs on imports from Canada and Mexico go into effect, with retaliatory measures from both countries.
March 5, 2025	A one-month exemption is granted to imports by U.S. automakers from Canada and Mexico.
March 6, 2025	The US postpones 25% tariffs on many imports from Mexico and some from Canada for a month.
March 12, 2025	Trump increases tariffs on all steel and aluminium imports to 25%.
March 24, 2025	Trump announces tariffs (25%) on countries buying oil or gas from Venezuela.
March 27, 2025	Trump announces tariff on imported cars (25%) and car parts.
April 2, 2025	Trump issues Executive Order implementing 'reciprocal tariffs' with a 10% baseline rate and higher country-specific rates.
April 4, 2025	China announces an 84% tariff on imports from US.

April 7, 2025	Trump announces additional 50% tariffs on imports from China in retaliation, taking the total to 104%.
April 9, 2025	Trump's 'reciprocal tariffs' take effect. China imposes additional tariff of 50% on the US. Later, Trump announces a pause of 90 days on 'reciprocal tariffs', but keeps a 10% tariff on all. Increases tariff on imports from China to 125%.
April 11, 2025	China imposes 125% tariffs on US with effect from 12 April.
April 22, 2025	Geneva talks between US and China begin.
May 5, 2025	US signs bilateral deal with UK.
May 12, 2025	US and China agree on a 90-day tariff truce; US reduces tariffs on Chinese imports from 145% to 30%, while China cuts tariffs from 125% to 10% on US imports.
May 16, 2025	Trump signals that US will soon issue a list of unilateral tariff rates on a country basis, while the 10% baseline tariff prevails.

3. What was the justification given for the tariff war?

The information revealed by the Trump administration mention a range of issues – from drug trafficking to national security and illegal migration – as the reasons for imposition of tariffs on its partner countries. The basic idea seems to be that of using the US' economic clout as the world's largest market to achieve strategic objectives, not just on the economic front but also on the above-mentioned multifarious objectives (The White House, 2025).

Another stated objective of these tariff announcements has been that of reducing the US trade deficit with its partners. President Trump views trade deficits as a result of unfair trade practices by U.S. trade partners and considers them a loss to the U.S. economy, frequently linking them to domestic job losses.

Table 3 presents the US' merchandise trade with its major trade deficit sources in the year 2024. China is at the top, with US trade deficit of US$ 295 billion, followed by the European Union and Mexico. India had a merchandise trade surplus of around US$ 46 billion in 2024 (Table 3). The merchandise trade deficit of the US stood at US$ 1.2 trillion in 2024 (Figure 1). The overall US trade deficit has shown a rising trend, albeit slow growth during the period between the global financial crisis and 2016.

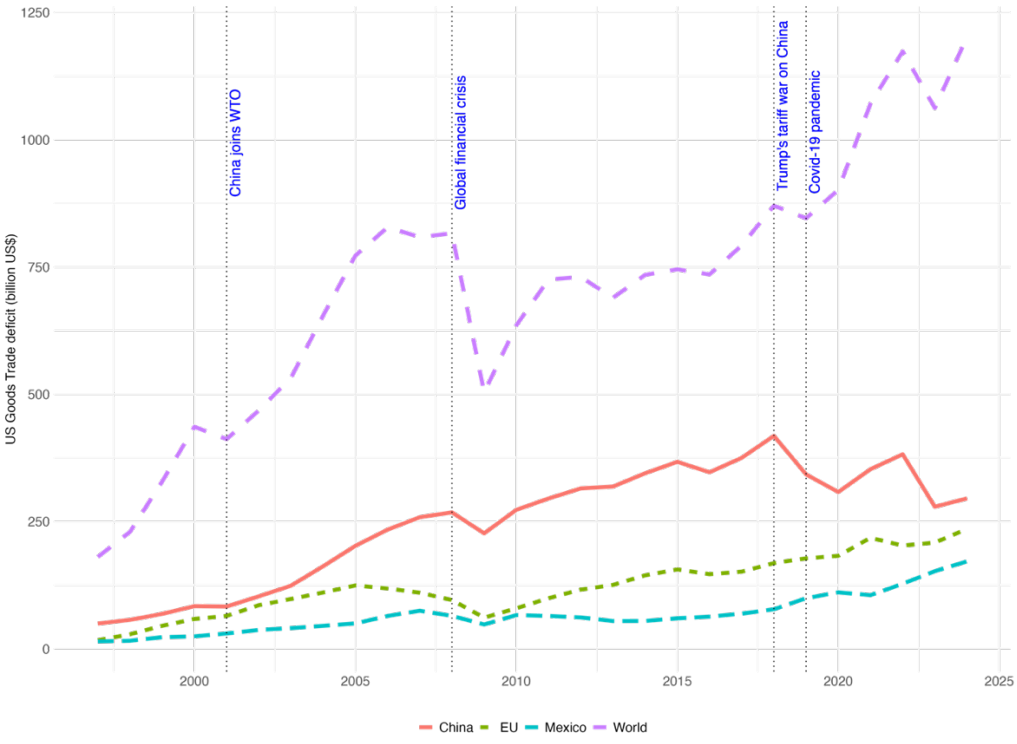
China has no doubt been the major source of trade deficit for the US in the recent year, though its share has been more or less on a decline since Trump's first trade war and trends towards friend-shoring in the aftermath of Covid-19 shock and geo-political fragmentation. This has meant that other countries such as Mexico and Vietnam have increased their share in the US trade deficit.

Table 3: Merchandise imports, exports and trade deficit of partner countries with whom US had the largest merchandise trade deficits in 2024 (in US$ billion)

	US Imports	US Exports	Trade deficit
China	438.95	143.55	295.40
European Union	605.76	370.19	235.57
Mexico	505.85	334.04	171.81
Vietnam	136.56	13.10	123.46
Taiwan	116.26	42.34	73.93
Japan	148.21	79.74	68.47
South Korea	131.55	65.54	66.01
Canada	412.70	349.36	63.34
India	87.42	41.75	45.66
Thailand	63.33	17.72	45.61
World	3267.46	2065.13	1202.33

Source: United States Census Bureau, authors' calculations

Figure 1: US goods trade deficit



Source: Author's calculation based on data from US Census Bureau

4. How were the 'reciprocal tariffs' calculated?

When the reciprocal tariffs were announced initially, they were said to have been calculated on the basis of an evaluation of the currency manipulation and trade barriers imposed by other countries on the US exports. However, as per the information later released by the Office of the United States Trade Representative, the reciprocal tariffs are "*the tariff rate necessary to balance bilateral trade deficits between the U.S. and each of our trading partners*" (Office of the United States Trade Representative, 2025a). The formula for the tariff was stated as follows:

$$\Delta\tau_i = \frac{x_i - m_i}{\varepsilon\ \varphi\ m_i}$$

- where, τ_i is the tariff imposed by the US on its partner country *I*,
- x_i and m_i are the exports and imports from country *i*,
- ε is the price elasticity of demand for imports, and
- φ is the price passthrough.

One can quickly make out that this formula stems from a basic partial equilibrium framework that we are all familiar with. Trump administration assumed a value of -4 for ε and 0.25 for φ. The final tariffs that were imposed were 'discounted' to almost half of the calculated reciprocal tariffs. For example, China had exports to the US worth US$ 426.89 billion, imports from US worth US$ 147.78 billion in 2024. This meant a US merchandise trade deficit with China of US$ 279.11 billion in 2024. Given the formula and parameter values above, this would imply a reciprocal tariff of $\frac{-279.11}{-426.89} = 0.72$ or 72%. After discounting, it resulted in a 36% tariff on China.

5. What are the implications of the tariff war?

The above idea seems problematic because it is applied on the total values of exports and imports with a partner country. The calculation should have been ideally conducted at a commodity level with x_i and m_i representing the real quantities of the commodity under consideration. The elasticities are likely to vary widely between commodities, and the passthrough of prices would depend on the nature of the industry under consideration.

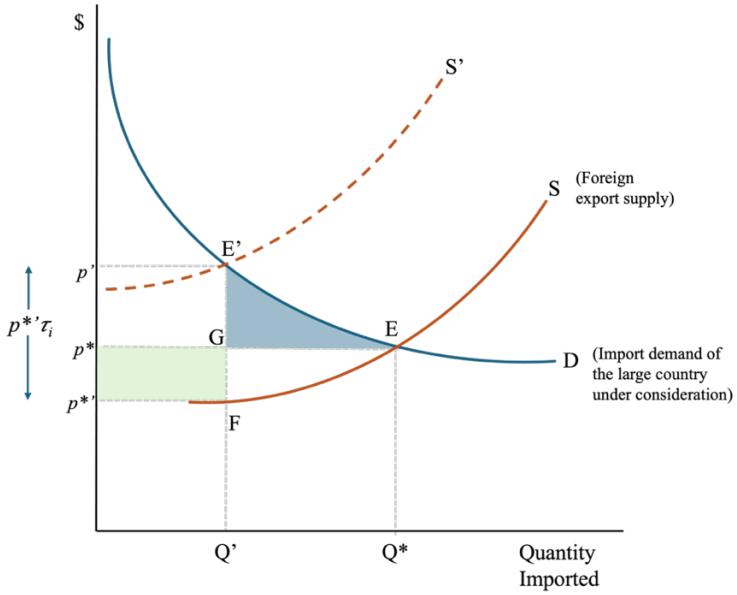
The framework completely ignores general equilibrium effects. Further, it ignores the existence of value chains in production. Let's assume for the time being that these are not major issues and the framework is true. Even under these assumptions, standard economics textbooks tell us that tariffs could result in a welfare loss to the tariff-imposing country. This can be seen in Figure 2.

- The demand curve for imports is given by D

- The foreign export supply curve before the tariff is given by S, in the case of a large country under free trade.
- With a tariff τ_i, the foreign export supply curve facing the consumers in the domestic country shifts to S'
    - the equilibrium price in the domestic market is p'
    - the quantity demanded at this price is Q'.
- Given this quantity demanded, the corresponding international price now becomes $p^{*'}$ by reading it off from the original supply curve.
- Thus, the tariff revenue accruing to the government is $p^{*'}\tau_i Q'$.
- On the other hand, there is a clear reduction in the consumer surplus, represented in Figure 2 by the area enclosed by $p'E'Ep^*$.

Essentially, the net welfare effect on the home country welfare depends on which area is greater: the green shaded area or the blue shaded area. The figure illustrates that the net gain crucially depends on the supply elasticity. If the supply is highly elastic, it is clear that there would be net welfare loss to the home country. Thus, the possible gains result from the improvements in terms of trade of the home country by reducing the international price of imports. Amiti et al. (2019) estimate that there were significant welfare losses to the US economy in the 2018 tariff wars with China. As they find out, the US' ability to influence world prices turned out to be pretty weak and the supply turned out to be more-or-less elastic.

Figure 2: The welfare effects of tariffs



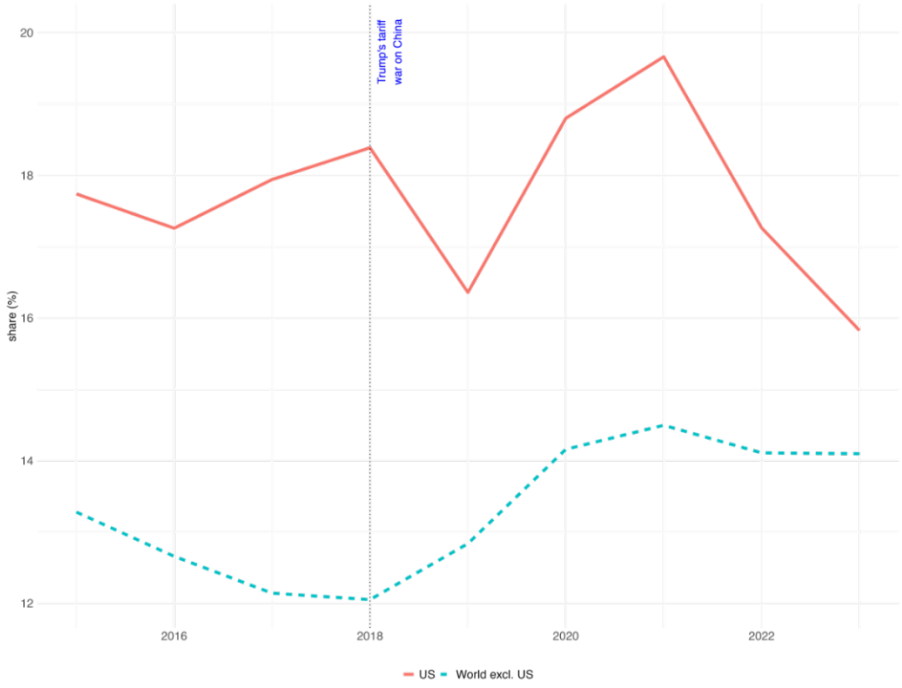
However, this is a static view of what would happen. Even if the supply curve were inelastic (which is not the case), in the presence of strategic interaction between countries, retaliation is a possibility, especially in a setup where countries are large enough to influence prices and therefore gain from such terms-of-trade effects.

The traditional 2-country, 2-goods models allude to an optimal tariff, when the countries are large. This leads to a situation where the free trade equilibrium is unstable, and the countries end up in a tariff war, each retaliating the tariff imposition by the other. The result being those countries end-up being worse off compared to a free-trade situation, given that incentives don't align with a strategy of unilateral reduction of tariffs (Pant, 2002). This means that the potential gains from terms of trade effects under the above framework get wiped away due to retaliation affecting domestic producers.

History is also witness to the fact that US' previous use of tariffs to restrict imports met with instant retaliation from its trading partners. The 1930 Smoot-Hawley Act is a case in point. O'Rourke et al. (2021) find that the US exports to countries that retaliated to the Smoot-Hawley tariffs fell by between 28% and 33%, indicating the effects of retaliation on the US. The Smoot-Hawley tariffs probably also hastened the tendency towards creation of trade blocs, such as the Ottawa Agreements of 1932, that led to the system of imperial preferences covering the British colonies and dominions.

A look at the trade trends suggests that after the imposition of tariffs by the US on China in 2018, there was a decline in the share of China in the US market, along with a rise in the share of China in the rest of the world market. This implies that probably, China was able to diversify away from the US market (Figure 3).

Figure 3: China's export share in US and rest of the World

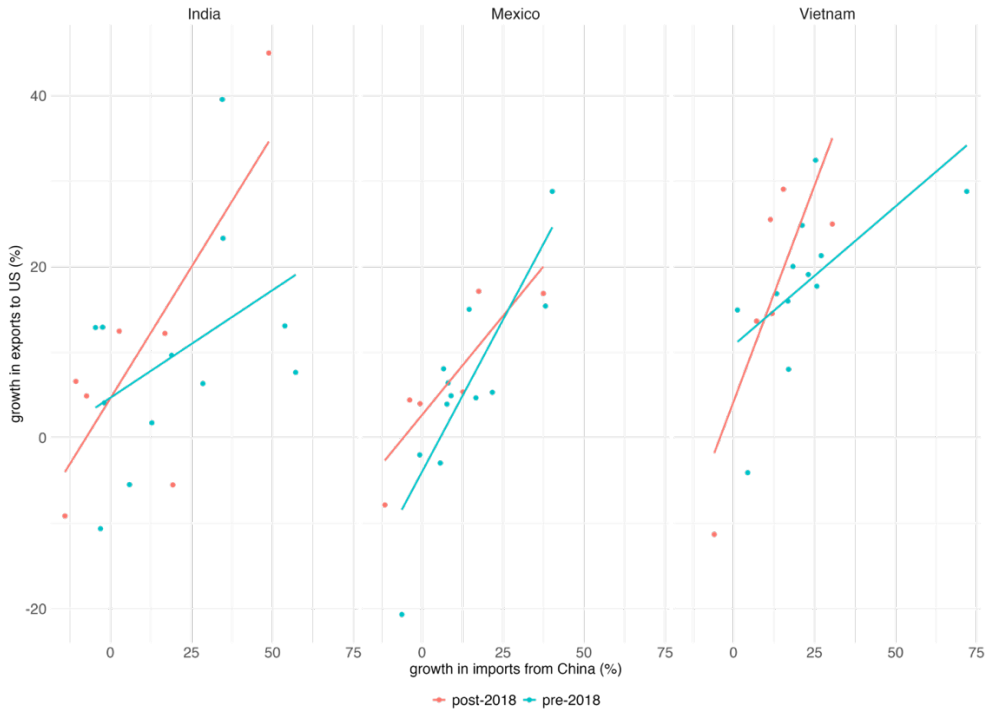


Source: Authors' calculations based on ITC Trade Map

At the same time, some countries emerged as connectors in the trade between China and the US (Gopinath et al 2024). We have plotted the year-on-year growth in the exports to US and the growth in imports from China for India, Mexico and Vietnam in Figure 4. We have made linear fit in each case, separately for pre-2018 years and post-2018 years (including 2018). We see that in the case of Vietnam and India, the co-movement between imports from China and exports to the US has

increased dramatically in the post-2018 period compared to the previous period. This could possibly be an indication of trade between China and the US being rerouted through these countries[1]. In the case of Mexico, the two variables were highly correlated even in the pre-2018 period and show negligible change in the post-2018 period.

Figure 4: Importing from China and Exporting to the US? (2005-2023)



Source: Authors' calculations based on ITC Trade Map

If, as other studies suggest, trade has been rerouted through countries like India, then there could be strategic advantages if this rerouting involves genuine value addition. The key question is whether such trade flows reflect a rewiring of value chain networks, rather than goods passing through the country without any value addition. If value is indeed being added, India could position itself as a critical player in value chains and potentially benefit from 'reciprocal' tariffs and shifting trade alignments.

The tariffs are also likely to have a wide-ranging impact on prices in the US. It is straightforward to see that the effect of tariffs under usual conditions is to lead to an increase in prices of commodities on which they are imposed. In addition to this direct effect, the prices of commodities that depend on intermediate inputs from other countries are likely to be higher. Given that many intermediate products cross borders several times before final goods are produced, tariffs on intermediate products are likely to have cascading effects. This means that generalised inflation is very likely as a result of the proposed reciprocal tariffs.

[1] Obviously, we do not claim any causal relationship based on these correlations.

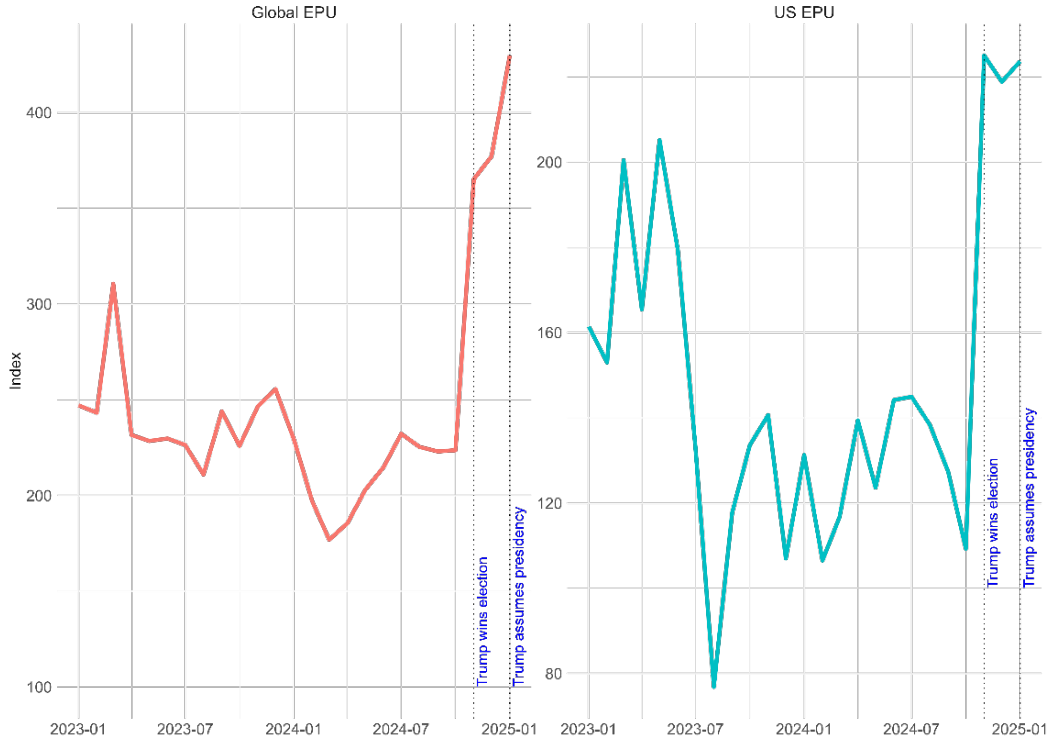
Trump's announcements, implementation and subsequent pauses and exemptions followed by a new set of announcements has created a high level of uncertainty in both the US and global economies. We find that Global Economic Policy Uncertainty index (EPU) as well as the US EPU spiked in the month of November 2024 when US Presidential election results were declared (Figure 5). Since then, the indices have remained at elevated levels.

This policy uncertainty has real effects on the economy. Increased uncertainties are likely to affect investor sentiments negatively. Clarke et al. (2005) find that this is especially true in the case of irreversible investments. In such an environment, firms often postpone or withhold investment decisions.

The impact of uncertainty on equity markets is seen with each round of tariff announcements sending the global stock markets crashing (Figure 6). The Indian financial markets were also affected, with stock markets crashing as foreign institutional investors (FIIs) started pulling out their investments. Decline of investor confidence in the US economy was also visible in the sell-off of US bonds and consequently rising government bond yields. The yield for a 10-year US treasury bill rose from 4.01% on 4 April 2025 to 4.48% on 11 April 2025.

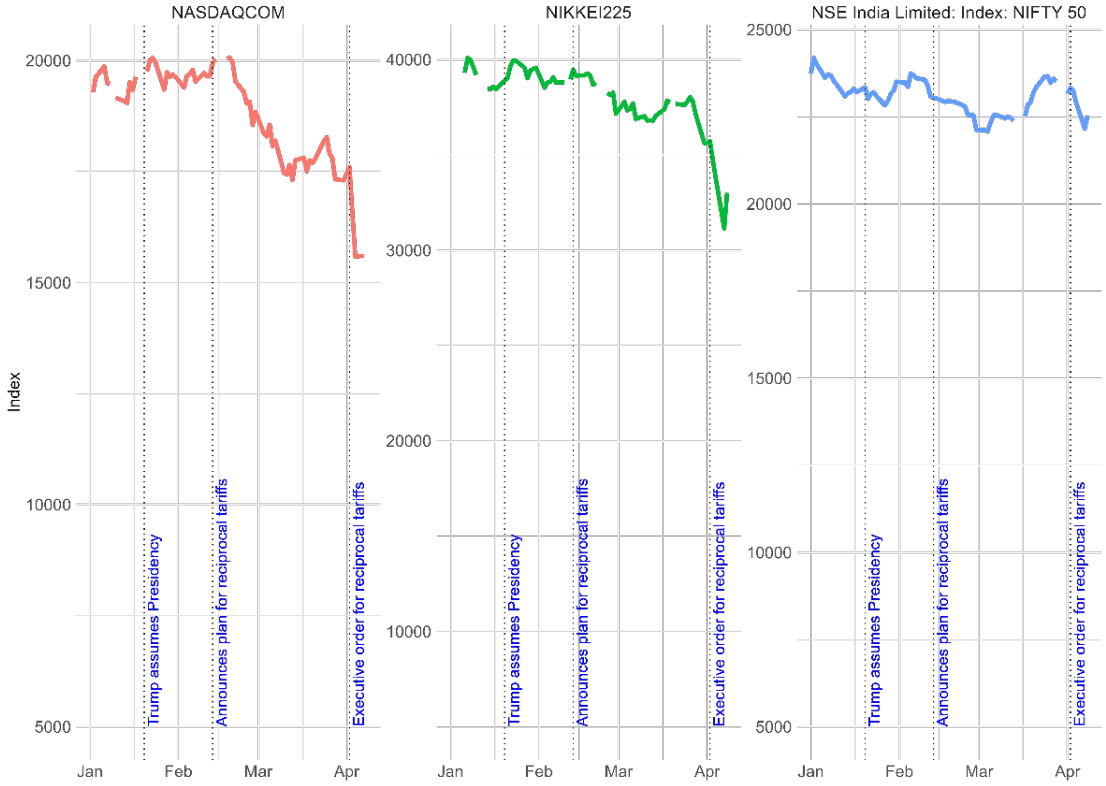
Another channel through which trade policy uncertainty could impact economic outcomes is the disruption and realignment of global supply chains. This could mean that, in order to hedge against the policy uncertainty, firms may prefer suppliers that are politically safer rather than economically most efficient. This could further lead to price pressures raising inflation, fuelling further uncertainties.

Figure 5: Trump's election and spike in economic policy uncertainty



Source: https://www.policyuncertainty.com/

Figure 6: Stock markets in the US, Japan and India



Source: CEIC

While Trump has often referred to unfair trade practices by trade partners, macroeconomists frequently point to the structural nature of the US trade deficits. Consider the national income identity:

$$Y = C + I + G + X - M$$

on rearranging we get, $$X - M = Y - (C + I + G) = S - I$$

- where, C is the consumption expenditure in the economy
- I denotes the expenditure by firms on capital goods and other investments
- G is the government expenditure
- X represents the exports by the economy and M represent the imports
- S denotes the domestic savings.

Thus, the trade deficit reflects the savings-investment gap in the US economy. This can arise in a growing economy, or in one with large budget deficits and substantial capital inflows (from savings surplus countries, such as China). Tariffs would not address this structural issue which can be addressed only by raising national savings and reducing budget deficits.

6. Potential opportunities for India?

The US is a major trade partner for India. In 2024, around 18% of India's exports (US$ 81 billion) went to the US. The major items of export included electrical machinery and equipment (US$ 12.6 billion), pearls and precious/semi-precious stones and metals (US$ 9.3 billion), pharmaceutical products (US$ 8.9 billion), etc.

Any tariff war will have implications for India's trade, and consequently on its industrial sector. India initiated discussions with the US government officials, trying to pre-empt the adverse tariff impositions. India also took decisions on cutting down tariffs on American motorcycle brands (Harley Davidson) and Bourbon whisky. Even so, India received 26% tariffs on all export goods to the US under the 'reciprocal tariffs'.

In all probable scenarios, China is likely to be the most affected, owing to the recent retaliations and escalating tariff war, while the reciprocal tariffs have been paused for a period of 90 days for other countries. Due to the relatively lower tariffs imposed on Indian goods, Indian manufacturers are expected to be less adversely affected than their Asian counterparts in this regard. This provides an opportunity to redirect trade flows and pave the way for new investments.

To identify products where India has the potential to boost exports in the US market, we calculate a bilateral revealed comparative advantage (RCA) with the US. We have defined bilateral RCA as follows:

$$BRCA = \frac{\frac{x_{Ind,US,i}}{X_{Ind,US}}}{\frac{x_{World,US,i}}{X_{World,US}}}$$

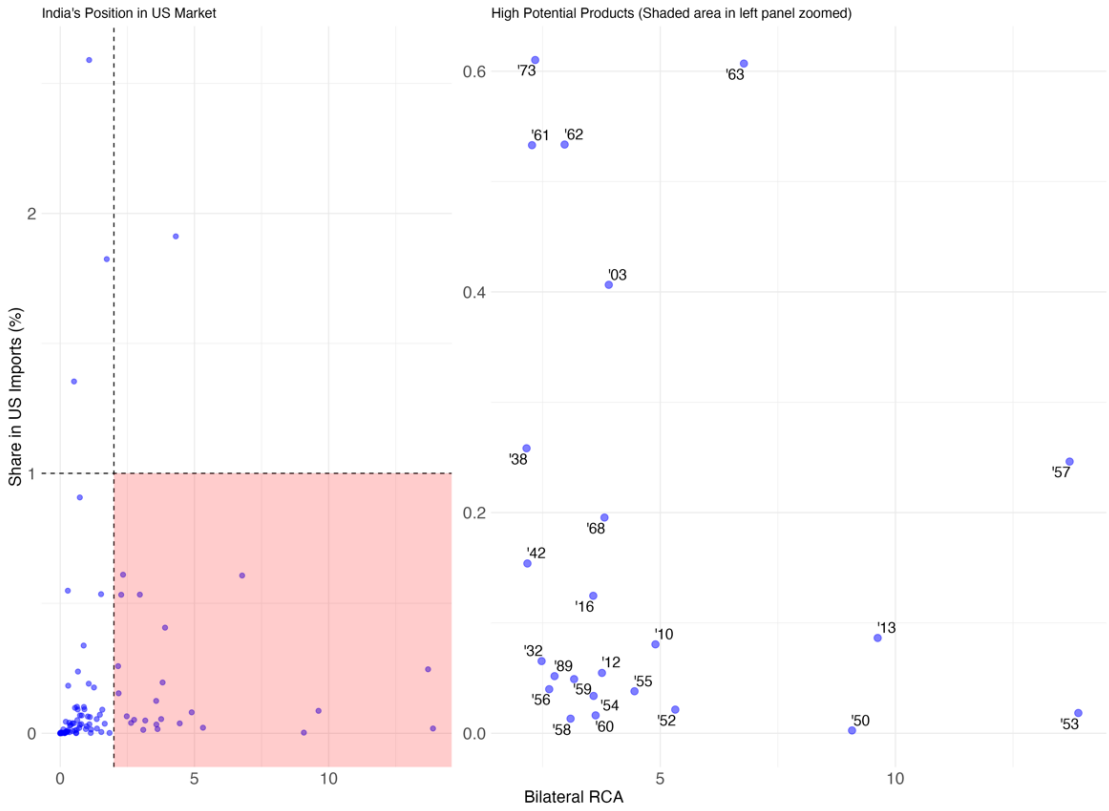
where,

- $x_{Ind,US,i}$ is India's exports of good I to the US,
- $X_{Ind,US}$ is the total exports of India to the US,
- $x_{World,US,i}$ is the world exports of product i to the US, and
- $X_{World,US}$ is the total world exports to the US.
- BRCA of greater than 1 indicates that the India has a revealed comparative advantage in the product compared to the world in the US market.

In Figure 7, we plot the share of Indian goods at the 2-digit level in the US market on the vertical axis, and the bilateral RCA measure on the horizontal axis. There are two panels in the figure. The left-hand side panel provides the complete plot. We can see that most products have a less than 1% share in the US market. Our objective is to highlight the products with a low share in the US market but high BRCA, that is the products with a high potential to boost their exports to the US market. For this we identify the products with less than 1% market share and a BRCA greater than 2; these are

highlighted in the left panel of the figure. This shaded region has been presented in the right-hand side panel with the product codes and a different scale for greater clarity.

Figure 7: Indian goods in the US market and the potential for growth



Source: Authors' calculations based on ITC Trade Map data

Based on our criteria, we have identified 24 products. The list is given in the Appendix table A1 Most of these products are in the textiles sector or agriculture and allied sectors. The sectors with highest BRCA sectors are primarily textile-related (e.g., codes 53, 57, 50, 63). Other vegetable textile fibres and silk (53, 50) show high BRCA despite minimal trade shares, suggesting that these are highly under-exploited product ranges for export to the US.

Other manufactured products with potential include ships/boats (89), chemical products such as dyes (32, 38), and iron and steel articles (73). It needs to be noted that India has a comparative advantage in both natural cotton as well as man-made fibres in the US market. Fish and marine products (03) and meat/fish preparations (16) are another set of sectors which have significant potential for boosting exports.

7. Concluding thoughts

While creating uncertainties, US actions on tariffs also present India with opportunities to tap into its underutilised trade potential. Experience from the first tariff war during Trump's previous presidency suggests that countries like Vietnam, with deeper integration into global value chains, benefitted from the diversion of trade away from China.

Focusing on establishing linkages in regional value chains could significantly enhance India's exports. A reduction in duties on intermediate goods could be a first step. If India aims to become an alternative to China in the value chain, openness to Chinese FDI could help not only secure investments but also acquire the necessary technologies and know-how. Given the US's importance as a major trading partner, this seeming crisis could turn out to be the opportunity India has been waiting for to turn around its fortunes in the world trading system.

The recent aggressive protectionist stance taken by the Trump administration may not yield the desired results and could lead to adverse consequences for both the US and the global economy. Each round of tariff announcements has resulted in upheavals in US investor confidence, as shown by stock market volatility and reduced trust in US Treasury bills. The current pause on 'reciprocal tariffs' has provided a temporary sigh of relief for US trade partners, except China. However, it is expected that US trade partners will seek trade deals with the US.

The flaw in the US policy lies in: first, viewing trade deficits as inherently negative; second, assuming that trade deficits are caused by the unfair practices of trading partners; and third, ignoring how modern manufacturing relies on global value chains. From a structural standpoint, reducing the US budget deficit may be a better approach to addressing trade deficits than imposing tariffs.

The recent developments have also raised questions about the relevance of international legal frameworks like the WTO. The WTO's dispute settlement mechanism has been left in shambles since Trump's first presidency, with the US blocking the appointment of officials to the body. It remains to be seen what this will ultimately lead to. Could countries other than the US agree to a freer trading system, or could negotiations with the US prompt other countries to seek similar market access benefits, resulting in an open trading system with universally lower tariffs? Alternatively, could the US' actions encourage countries to establish more barriers to trade? The outcome remains uncertain.

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Appendix

Table A1: List of identified high potential products for India in the US market

Product code	Product	Share %	BRCA
53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	0.02	13.9
57	Carpets and other textile floor coverings	0.25	13.7
13	Lac; gums, resins and other vegetable saps and extracts	0.09	9.6
50	Silk	0.00	9.1
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	0.61	6.8
52	Cotton	0.02	5.3
10	Cereals	0.08	4.9
55	Man-made staple fibres	0.04	4.5
03	Fish and crustaceans, molluscs, and other aquatic invertebrates	0.41	3.9
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	0.20	3.8
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal ...	0.05	3.8
60	Knitted or crocheted fabrics	0.02	3.6
54	Man-made filaments; strip and the like of man-made textile materials	0.03	3.6
16	Preparations of meat, of fish, of crustaceans, molluscs or other aquatic invertebrates, or ...	0.12	3.6
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable ...	0.05	3.2
58	Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery	0.01	3.1
62	Articles of apparel and clothing accessories, not knitted or crocheted	0.53	3.0
89	Ships, boats, and floating structures	0.05	2.8
56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof	0.04	2.6
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring ...	0.07	2.5
73	Articles of iron or steel	0.61	2.3
61	Articles of apparel and clothing accessories, knitted or crocheted	0.53	2.3
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles ...	0.15	2.2
38	Miscellaneous chemical products	0.26	2.2

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IPPR

Tracing India's Economic Path: A Critical Assessment of Nehru's Legacy and Its Enduring Impact

Review article based on "The Nehru Development Model: History and Its Lasting Impact" by Arvind Panagariya.

Narayan Ramachandran*

Arvind Panagariya, first vice-Chairman of India's NITI Aayog, and current Chairman of the 16th Finance Commission, has written an important book on the economy of post-Independence India. Panagariya's lifelong friend and mentor, Professor Jagdish Bhagwati of Columbia University summarizes the book thus, "he tells the fascinating tale of India's early efforts under Pandit Jawaharlal Nehru to combat poverty through industrialization and growth, why they failed, and how the decisions made during those fateful decades continue to influence economic policies and outcomes till today".

Since this book is one among few that sharply traces the contemporary economic history of India over about eight or nine decades, it makes a significant contribution. The author has relied heavily on primary archival material, readily available online from sources such as the websites of the Lok Sabha, Ministry of Culture, Gokhale Institute, Internet archive of the erstwhile Planning Commission, etc. He has made extensive use of archived newspaper articles, speeches made at Congress Party forums, thoughts expressed in printed autobiographies, and archival letters written among colleagues.

The book is laid out in three easy-to-read sections: Part 1 traces the history of Nehru's economic thought, how it was influenced from outside over time, and how Nehru in turn osmotically influenced others around him; Part 2 lays out the policies, their implementation, and outcomes; and Part 3 discusses the continuing impact of those policies.

The first part refers to the evolution of Nehru's own economic thought. Even the economists among us readily slip into describing Nehru as a "Fabian Socialist" without ever wondering where or how that came about. Panagariya does an excellent job of tracing Nehru's economic philosophy. Many readers will be surprised to learn that Nehru "mellowed" into gentle socialism by the time of Independence. Panagariya says "*Nehru's embrace of socialism was rooted in the belief that imperialism was the direct result of capitalism; capitalism gave rise to factories which, in pursuit of*

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profits, sought cheap sources of raw materials and lucrative markets for the finished products. Colonies served both functions."

With this foundation, Nehru's economic philosophy started out as being quite hardline, with an emphasis on self-sufficiency, industrialization, and public ownership. Even though Nehru backed off from the full Soviet-style economic organization from which many elements of that framework were borrowed, he was able to influence many around him, most particularly P.C. Mahalanobis.

As a statistician, Mahalanobis translated these ideas into a formal model, which became the basis for the Second Five-Year Plan in 1956. The first Five-Year Plan was based on a capital accumulation model that was broadly similar to a Keynesian Harrod-Domar model, but the Mahalanobis 2-sector and 4-sector models were used extensively in subsequent plans during Nehru's Prime Ministerial term. The Mahalanobis models were still taught to Indian policy makers even two or three decades after Independence.

Panagariya notes that even among foreign experts, none expressed any reservations other than Milton Friedman (who was invited not by the Indian Government but by the U.S. Government). Panagariya could have added to his argument by evaluating Friedman's critique, but curiously lets it go, since it did not seem to influence the Indian direction at that time. A few Indians did reflect the view that "business should be left to business" and they included Minoo Masani, B.R. Shenoy, A.D. Shroff and C. Rajagoplachari. Several of these individuals went on to establish the Swatantra party, India's only party since Independence with a focus on free enterprise.

In Part Two, Panagariya reveals a little-known fact: that in British India industry was unregulated until the turn of the Century, and when regulated under the Government of India Act of 1919 it became a state subject. Central control of industries was envisaged with the issuance of the Statement of Industrial Policy (SIP) 1945. The SIP was the first introduction of a major role for the Union Government in industry, primarily through the mechanism of licensing. Thus, the "license-Raj" was first conceived in 1945.

The author points out that the commonality of the SIP with the spirit of the 'Bombay Plan' (put forward by Indian industrialists in 1944) stems from the fact that Ardeshir Dalal was a principal author of the SIP and a contributor to the Bombay Plan. The Industrial Policy Resolution (IPR) of 1948 was the first post-independence framework for economic policy. and it appears to be a classic Keynesian document of the time. The revised IPR of 1956 had the stamp of Mahalanobis and the imprint of the Soviet Gosplan method of central planning all over it.

Panagariya traces this big shift in 1956 to the death of Sardar Patel and the full ascendance of Nehru to the helm of India. On the side of labour, Panagariya points out that India is unique in placing the social revolution ahead of the economic revolution. There were very few dissenters against the labour laws. The author points to American economist John P. Lewis, who warned about "*the cost pressures and inhibitions to production expansion that comparatively strong unionization and strong labour-welfare legislation may create in so underdeveloped an economy as India's.*"

Panagariya's research reveals that India's trade policy was very liberal until World War I. Between World War I and II there were some instances of tariffs, including reciprocal tariffs between Britain and India. It was only after World War II that a more systematic set of foreign exchange and import controls were imposed.

The author says that, surprisingly, post-war controls were eased quite a bit and continued in that vein until the advent of Second Plan in 1956 and a balance of payments crisis of sorts that happened in 1957 in the wake of poor agricultural output. It was thus in 1957 that the seeds were sown for a highly restrictive import policy and a paranoia about the balance of payments. Panagariya concludes with an excellent chapter on the history of growth and poverty during the Nehru years, that can simply be summarized by the statement that GDP growth that averaged about 4% was not sufficient to make a dent in poverty, particularly at a time when the population was still growing by about 2% per year.

In Part Three, Panagariya talks about the lasting impact of Nehru's economic model. He says that Nehru's political project of establishing democratic rule with universal suffrage was a resounding success, but his economic one of pursuing a public-sector-led industrialization was an "unqualified failure".

My economic persuasion leans in the same direction as Panagariya; for free enterprise and free trade, with the Government being an enabler and enforcer of fair play. Even then, Panagariya's arguments in this section appear weak to me. In my judgement, he has axiomatically chosen to lay the blame for India's lost growth opportunity squarely at the feet of only one individual, namely Nehru. I think that is a simplistic reading of history for three reasons.

One, Nehru was a product of his time. Mao, Nasser, Tito, Sukarno and many other leaders of the time had shaken off colonialists, and had chosen a path of a mixed economy and self-sufficiency (you might call that an Imperialist reaction). While the Soviet model, that by then was about three decades old, had begun to show some fault lines, it had not shown any fatal failures. Well into the 80s, Keynes and Marx dominated economic thought everywhere over Hayek and Schumpeter. Those with a different economic vision in India, like the Swatantra Party, were unable to secure the political majority to influence India's economic direction.

Second, Nehru's daughter Indira Gandhi, who became Prime Minister later in the decade when Nehru died, steered the ship even more towards the socialist direction, mostly to consolidate political control. Third, to lay blame on Nehru for his successors' inability to "right the ship" according to Panagariya is taking it a bit far. Panagariya conveniently says little about economic thought after the BJP came to power in 2014.

While India stopped being a "license-raj" after the 1992 reforms, it remains a deeply statist economy in 2025 with a labyrinthine set of rules and a strong belief in the administrative state. Is the economic philosophy of Prime Minister Modi's Government unshakably a consequence of Nehru, beginning 50 years after his death and continuing now for another twelve years? In other countries

like China, Malaysia and Indonesia, it was the successors of post-War leaders who implemented reforms, beginning in the late 80's, that reduced the role of the State in business.

That said, the book makes an outstanding contribution to the economic history of India, collecting in one place the evolution of contemporary India's economic journey. Taken along with the scholarly work of Manmohan Singh, Jagdish Bhagwati, Padma Desai, TN Srinivasan, and other work by the author himself, the book is a "must have" on any 'Indian economics' bookshelf.

Beyond Nehru, what continues to influence the statist leanings of the Indian establishment will await another book. In my view, Indian citizens are hesitatingly capitalist while the Indian establishment has remained unhesitatingly statist since Independence. Nehru may have blazed that path, but all the rest of us are culpable for not deviating too far from it. With the world veering to populism, protectionism, and the arbitrary imposition of rules for economic exchange, we may have to wait a long time before the primacy of the Indian state reduces.

The Nehru Development Model: History and Its Lasting Impact by Arvind Panagariya, Penguin Viking, India, 2024, Pages 544, Hardcover ₹845.

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