

Fiscal Performance and Human Development across Indian States: A Panel Data Analysis.

Mrs. Tamanna¹, Dr. Devinder Singh²

¹ Research Scholar, Department of Economics, Indira Gandhi University, Meerpur, Rewari, Haryana, India.

Email: aggarwamtamanna39@gmail.com

² Associate Professor, Department of Economics, Indira Gandhi University, Meerpur, Rewari, Haryana, India.

Email: dshooda.igu@gmail.com

Abstract

Rising human development alongside uneven fiscal trajectories reveals a more complex development story across Indian states. Using a balanced panel of 24 states over 1995-2020, human development improved steadily from 0.488 to 0.670, while fiscal performance fluctuated and remained widely dispersed, with CFPI ranges still exceeding 20 points in later years. Despite higher fiscal scores in special category states, their human development advantage remained statistically insignificant. Correlation weakened over time, reaching nearly zero (0.013) by 2020 and two-way fixed-effects estimates showed no significant within-state impact of fiscal performance on human development. The findings indicate that outcomes depend more on expenditure quality, institutional effectiveness and long-term social investment than on aggregate fiscal strength alone.

Keywords: Fiscal performance, Human Development Index, Composite Fiscal Performance Index, Panel data analysis, Inter-state disparities, Fiscal federalism, Economic development.

Introduction

Fiscal performance in Indian states is central as they manage major development responsibilities within a constrained federal structure. While they finance sectors such as health, education and infrastructure, their tax autonomy has reduced after the introduction of the Goods and Services Tax in 2017, increasing dependence on intergovernmental transfers and coordinated fiscal arrangements. This shift has made fiscal performance directly linked to the developmental capacity of states (Jha & Bali 2023). This changing structure is reflected in fiscal indicators. Own-tax revenue increased from 6.4 to 7.0 percent of GSDP between 2019-20 and 2023-24, while grants declined to 2.5 percent and total revenue receipts reached 14.1 percent. Although capital outlay rose to 2.8 percent of GSDP, the fiscal deficit remained high at 3.2 percent and the revenue account continued in deficit (Chakraborty 2024). These conditions are not uniform across states. Central transfers declined, thirteen states recorded revenue deficits and most exceeded the fiscal-deficit norm, indicating growing fiscal stress. Such pressures restrict developmental expenditure as committed spending absorbs a large share of resources (Chakraborty 2024). This constraint becomes more visible in sectoral spending. The share of states' own revenue in total receipts declined after 2014-15, while dependence on Union transfers increased, particularly in healthcare, where expenditure remains low and planning autonomy is limited (Raj et al. 2024). At the same time, differences in expenditure efficiency across states shape outcomes, as governance quality determines how effectively fiscal resources are translated into welfare gains (Mohanty & Bhanumurthy 2018). In this context, fiscal performance connects closely with human development outcomes. Some states have achieved a balance between economic growth and human development, while others continue to lag, showing that fiscal capacity is essential not only for higher spending but also for achieving equitable and sustained development (Mehrotra & Parida 2023).

Table 1: Key Fiscal Indicators (Centre and States) (percent)

Section	Fiscal Indicator	2019-20	2020-21	2021-22	2022-23	2023-24RE	2024-25BE
A. Centre							
1	NRR/GDP	8.4	8.2	9.2	8.8	9.2	9.2
2	Capex/Totex	12.5	12.1	15.6	17.6	21.4	23.3
3	Social Services expenditure/Totex	5.3	4.9	7.1	5.3	5.6	5.0
4	Committed expenditure/Totex	45.8	39.8	42.1	NA	NA	NA

5	Social safety net expenditure/Totex	8.85	21.54	12.19	10.29	8.19	7.57
6	FD/GDP	-4.7	-9.2	-6.7	-6.4	-5.6	-5.1
7	Outstanding Liabilities/GDP	50.8	60.8	57.4	56.5	57.1	56.0
B. States (26 States)							
1	ORR/GDP	7.1	6.5	6.9	7.3	7.8	7.9
2	Capex/Totex	13.0	12.1	13.7	13.7	16.2	16.2
3	Social Services expenditure/Totex	37.1	37.8	38.2	38.4	39.3	39.5
4	Committed expenditure/Totex	39.4	39.5	38.5	37.3	NA	NA
5	FD/GDP	-2.6	-4.0	-2.7	-2.7	-3.3	-4.0
6	Outstanding Liabilities/GDP	25.2	29.6	27.7	26.8	27.3	27.4
C	Net Liabilities of Centre and States (percent of GDP)	75.1	88.9	83.1	81.2	82.0	80.5

Source: “Finance Accounts and Budget documents of States; Budget documents of Union Government; Controller General of Accounts (CGA); Salaries data of Central government from Lok Sabha Unstarred Question No. 4269 (27 March 2023); GDP from Ministry of Statistics and Programme Implementation (MoSPI).”

Note: “For Centre data for the fiscal indicators NRR/GDP, Capex/Totex and FD/GDP for 2023-24, net provisional actuals (PA) are used. NRR means net revenue receipt of Centre is defined as total revenue receipt net of devolution. RE means revised estimate; BE means budget estimate; Capex means capital expenditure; Totex means total expenditure; FD means gross domestic product; FD means fiscal deficit; ORR means own revenue receipts; NA means not available. Social safety net expenditure includes expenditure on food subsidy, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), National Social Assistance Programme (NSAP) and Pradhan Mantri Kisan Samman Nidhi (PM-KISAN). States’ data do not include data for Sikkim and Arunachal Pradesh. Committed expenditure comprises expenditure on salaries and wages, pension payments and interest payments. Net liabilities of Centre and states is the addition of outstanding liabilities of Centre and all states. There are 26 states not of central loans to states.”

Review of Literature

Literature on fiscal performance and human development argues that state capacity matters but spending alone does not automatically produce better outcomes. Sen placed human capability, not income, at the centre of development, making health, education and dignity the real test of public policy (Sen, 1999). Anand and Ravallion found that public services and private income both shape human development, so fiscal analysis must look beyond deficit control (Anand & Ravallion, 1993). Ranis, Stewart and Ramirez showed a two-way link: economic growth can support human development, while educated and healthier citizens strengthen growth (Ranis et al., 2000). For India, Drèze and Sen argued sharply that states with stronger social provisioning, especially Kerala and Tamil Nadu, achieved better welfare despite different income paths (Drèze & Sen, 2013).

Public expenditure studies are more cautious. Filmer and Pritchett found that health spending has weak effects when governance and delivery are poor (Filmer & Pritchett, 1999). Gupta, Verhoeven and Tiongson also stressed that expenditure efficiency matters more than budget size (Gupta et al., 2002). At the Indian state level, Hooda reported high inter-state variation in health expenditure and linked it to fiscal capacity and demographic pressure (Hooda, 2015). Mohanty assessed expenditure efficiency across Indian states and used education, health and social-sector spending to connect fiscal outlays with outcomes (Mohanty, 2018). Kushwaha found a positive relationship between education expenditure and HDI among Indian states, though causality remains sensitive to model choice (Kushwaha, 2020). Recent panel evidence by Yaqub shows that social-sector spending improves education outcomes and reduces infant mortality, supporting the case for targeted fiscal expansion (Yaqub, 2025). NITI Aayog’s Fiscal Health Index measures fiscal performance through expenditure quality, revenue mobilisation, fiscal prudence, debt index and debt sustainability, which fits well with panel analysis of Indian states (NITI Aayog, 2025).

Objectives of the Study

To examine the trends and inter-state variations in fiscal performance and human development across selected Indian states during 1995–2020.

To compare fiscal performance and human development outcomes between special category and non-special category states in India.

To analyse the relationship and impact of fiscal performance on human development across Indian states.

Inter-State Disparities in Fiscal Capacity and Development Outcomes

Inter-state disparities in fiscal capacity reflect structural differences in income levels, economic base and institutional strength. States with higher development generate stronger revenues through broader tax bases and diversified activity, while weaker states depend more on central transfers. Fiscal strength remains closely linked to per capita income, with richer states consistently showing greater revenue capacity than poorer ones (Varughese and Aswathy 2024). This gap is evident in income levels. Haryana recorded per capita income above ₹2,96,000 in 2022-23, while Bihar remained near ₹54,000, reflecting a gap of over five times. Southern states such as Karnataka and Telangana also exceeded ₹3,00,000, whereas several eastern states continued to lag, indicating persistent structural inequality (IJS DR 2024). These income differences translate into fiscal disparities, creating a cycle where stronger states invest more in infrastructure, education and health, sustaining higher growth, while weaker states face constraints in capital formation and service delivery. Economically advanced regions dominate national output, with five southern states contributing nearly 30 percent of GDP alongside higher public expenditure levels (Shodhsamagam 2025).

Historical patterns reinforce this divergence. Economic reforms since the 1990s concentrated investment in already developed states, widening regional inequality. Migration from poorer to richer states further deepens the gap, as labour mobility does not bring proportional fiscal redistribution (Sharma 2025). Disparities are also visible in social sector spending. Per capita expenditure on education and related services varies significantly, with richer states allocating more, leading to unequal access to public goods and long-term human development outcomes (Kumar 2024). Debt sustainability highlights further imbalance, as some states maintain fiscal discipline while others face rising liabilities and limited revenue growth. These differences in fiscal management and economic base shape both current performance and long-term development capacity across states (Bahal 2025).

Evolution of Fiscal Federalism and its Developmental Implications in India

The evolution of fiscal federalism in India reflects efforts to balance central authority with state autonomy within a diverse economy. The Constitution assigned taxation and expenditure responsibilities to address vertical and horizontal imbalances, while institutions like the Finance Commission ensured redistribution through tax devolution and grants, shaping intergovernmental fiscal relations (Reddy, Reddy and Chakraborty 2025). In the early phase, fiscal federalism operated under a centralized planning model where resource allocation was largely controlled by the Planning Commission and transfers were discretionary, limiting state autonomy. Economic reforms in the 1990s shifted this structure toward a more rule-based system, strengthening the Finance Commission and expanding the fiscal space of states (Rao 2011). A major shift occurred after 2015 with the replacement of the Planning Commission by NITI Aayog and the increase in states' share of central taxes from 32 percent to 42 percent, enhancing fiscal decentralization and enabling states to prioritize development expenditure more independently (CSEP 2022).

The introduction of the Goods and Services Tax further redefined fiscal relations by creating a unified indirect tax system governed jointly through the GST Council. While it improved efficiency, it also reduced state tax autonomy and increased dependence on compensation mechanisms (Devan 2025). Fiscal arrangements have increasingly emphasized discipline and performance. The Fifteenth Finance Commission retained states' share at 41 percent and incorporated criteria such as income distance and tax effort, while fiscal rules continue to limit deficits to around 3 percent of GSDP (Finance Commission 2021). These changes have direct developmental implications, as states account for a large share of public expenditure, particularly in social sectors. Developmental spending increased from 8.8 percent of GDP in 2004-05 to 12.5 percent in 2021-22, highlighting the growing role of states in delivering public goods and shaping human development outcomes (Vision IAS 2024).

Nature and Sources of Data

The study examines the relationship between fiscal performance and human development across Indian states by using a balanced panel framework. Human development is measured through the Human Development Index (HDI) and fiscal performance is measured through the Composite Fiscal Performance Index (CFPI). The fiscal indicators used for constructing fiscal performance are drawn from state-level fiscal statistics reported by the Reserve Bank of India, while the HDI series is taken from Human Development Reports. The analytical grouping of states into special category and non-special category states follows the National Development Council classification, subject to the condition of consistent data availability over the study period.

The study period covers six five-year observations: 1995, 2000, 2005, 2010, 2015 and 2020. The final sample contains 24 states and 144 state-year observations. Only those states are included for which consistent fiscal and HDI data are available across the whole period. States formed after 1991 are excluded from the final balanced sample in order to preserve comparability through time. Jammu and Kashmir and Uttarakhand are excluded from the special category group, while Chhattisgarh, Jharkhand and Telangana are excluded from the non-special category group on data-continuity grounds.

Table 2. Variables, Definitions and Sources

Variable	Symbol	Definition	Measurement
Human Development Index	HDI_{it}	Composite measure of health, education and standard of living for state i in year t	Index bounded between 0 and 1
Composite Fiscal Performance Index	$CFPI_{it}$	Composite fiscal score for state i in year t	0-100 scale; higher value denotes better fiscal performance
State fixed effect	μ_i	Unobserved time-invariant state-specific factors	Model term
Year fixed effect	λ_t	Common time-specific effects	Model term
Error term	ε_{it}	Idiosyncratic disturbance	Model term

*Source: Prepared from state fiscal indicators reported by the Reserve Bank of India and HDI values reported in Human Development Reports.

Table 2 shows the operational definition of HDI, CFPI, fixed effects and the error term used in the panel model. The HDI definition follows the UNDP approach of combining health, education and standard of living, while the fiscal-performance side is close to NITI Aayog's Fiscal Health Index framework based on expenditure quality, revenue mobilisation, fiscal prudence and debt sustainability (UNDP, n.d.; NITI Aayog, 2025).

Panel Design and Sample Structure

The dataset is a balanced panel. This means that each state is observed in all six time periods. The balanced structure makes it possible to analyze both cross-state differences and within-state changes over time without losing observations to missing data. The final panel consists of 24 states, of which 9 are special category states and 15 are non-special category states.

Table 3. State Grouping Used in the Analysis

S. No.	State	Category
1	Arunachal Pradesh	Special category
2	Assam	Special category
3	Himachal Pradesh	Special category
4	Manipur	Special category
5	Meghalaya	Special category
6	Mizoram	Special category
7	Nagaland	Special category
8	Sikkim	Special category
9	Tripura	Special category
10	Andhra Pradesh	Non-special category
11	Bihar	Non-special category
12	Goa	Non-special category
13	Gujarat	Non-special category
14	Haryana	Non-special category
15	Karnataka	Non-special category
16	Kerala	Non-special category
17	Madhya Pradesh	Non-special category
18	Maharashtra	Non-special category
19	Odisha	Non-special category
20	Punjab	Non-special category
21	Rajasthan	Non-special category
22	Tamil Nadu	Non-special category
23	Uttar Pradesh	Non-special category
24	West Bengal	Non-special category

Source: Prepared from the final balanced sample of states classified under the National Development Council framework and retained on the basis of data continuity.

Table 3 shows the special and non-special category grouping retained for the balanced panel. This grouping follows the National Development Council logic for special category states, where difficult terrain, low population

density, strategic border location, economic backwardness and non-viable state finances were treated as policy-relevant criteria (Government of India, 2016; PRS Legislative Research, 2020).

Construction of the Human Development Variable

For each state i and year t , human development is measured by the Human Development Index:

$$HDI_{it} = (I_{H,it} \times I_{E,it} \times I_{Y,it})^{\frac{1}{3}} \quad (1)$$

where $I_{H,it}$ denotes the health dimension index, $I_{E,it}$ denotes the education dimension index and $I_{Y,it}$ denotes the income or standard-of-living dimension index. Each dimension index is obtained through min-max normalization:

$$I_{d,it} = \frac{X_{d,it} - X_d^{min}}{X_d^{max} - X_d^{min}} \quad (2)$$

where $X_{d,it}$ is the actual value of dimension d for state i in year t and X_d^{min} and X_d^{max} are the goalpost minimum and maximum values for that dimension. In the empirical analysis, the final HDI values are used directly as the dependent variable.

Construction of the Fiscal Performance Variable

Fiscal performance is represented by a Composite Fiscal Performance Index (CFPI) constructed by combining four broad dimensions of state fiscal management: deficit management, own revenue effort, expenditure quality and debt sustainability. The index follows a composite-index approach in which raw fiscal indicators are first converted into standardized indices and then aggregated.

For a favorable indicator, the normalized index is:

$$I_{jit}^+ = \frac{X_{jit} - \min(X_j)}{\max(X_j) - \min(X_j)} \times 100 \quad (3)$$

For an adverse indicator, the normalized index is:

$$I_{jit}^- = \frac{\max(X_j) - X_{jit}}{\max(X_j) - \min(X_j)} \times 100 \quad (4)$$

where X_{jit} is the value of fiscal indicator j for state i in year t . This transformation ensures that higher index values uniformly denote better fiscal performance. The deficit-management component is defined as:

$$DMI_{it} = \frac{RDI_{it} + GFDI_{it}}{2} \quad (5)$$

where RDI_{it} is the normalized revenue-deficit index and $GFDI_{it}$ is the normalized gross-fiscal-deficit index. These are derived from:

$$RDI_{it} = \frac{RD_{it}}{GSDP_{it}}, GFDI_{it} = \frac{GFD_{it}}{GSDP_{it}} \quad (6)$$

where RD_{it} denotes revenue deficit, GFD_{it} denotes gross fiscal deficit and $GSDP_{it}$ denotes gross state domestic product. The own-revenue-effort component is:

$$OREI_{it} = \frac{SOTRI_{it} + SONTRI_{it}}{2} \quad (7)$$

where $SOTRI_{it}$ is the state own-tax-revenue index and $SONTRI_{it}$ is the state own-non-tax-revenue index, derived from:

$$SOTRI_{it} = \frac{OTR_{it}}{RR_{it}}, SONTRI_{it} = \frac{ONTR_{it}}{RR_{it}} \quad (8)$$

Here, OTR_{it} denotes own tax revenue, $ONTR_{it}$ denotes own non-tax revenue and RR_{it} denotes revenue receipts. The expenditure-quality component is:

$$EQI_{it} = \frac{DEI_{it} + NDEI_{it}}{2} \quad (9)$$

where DEI_{it} is the development-expenditure index and $NDEI_{it}$ is the non-development-expenditure index. These are based on:

$$DEI_{it} = \frac{DEVEXP_{it}}{TE_{it}}, NDEI_{it} = \frac{NDEVEXP_{it}}{TE_{it}} \quad (10)$$

where $DEVEXP_{it}$ denotes development expenditure, $NDEVEXP_{it}$ denotes non-development expenditure and TE_{it} denotes total expenditure. Since a larger share of non-development expenditure is undesirable, $NDEI_{it}$ is reverse-normalized so that a higher value indicates better expenditure quality. The debt-sustainability component is:

$$DSI_{it} = \frac{DSRI_{it} + ODRI_{it} + MBI_{it}}{3} \quad (11)$$

where $DSRI_{it}$ is the debt-servicing-ratio index, $ODRI_{it}$ is the outstanding-debt-ratio index and MBI_{it} is the market-borrowing index. These are obtained from:

$$DSRI_{it} = \frac{IP_{it}}{RR_{it}}, ODRI_{it} = \frac{OD_{it}}{GSDP_{it}}, MBR_{it} = \frac{MB_{it}}{GFD_{it}} \quad (12)$$

where IP_{it} denotes interest payments, OD_{it} denotes outstanding debt and MB_{it} denotes market borrowing. Finally, the Composite Fiscal Performance Index is calculated as the simple average of the four major fiscal dimensions:

$$CFPI_{it} = \frac{DMI_{it} + OREI_{it} + EQI_{it} + DSCI_{it}}{4} \quad (13)$$

The empirical estimation uses the final CFPI scores directly. These scores are measured on a 0-100 scale, where a higher value denotes stronger overall fiscal performance.

Econometric Specification

The empirical relationship between fiscal performance and human development got through panel regression techniques. Let i denote the state and t denote the year. The pooled ordinary least squares model is:

$$HDI_{it} = \alpha + \beta CFPI_{it} + \varepsilon_{it} \quad (14)$$

where α is the intercept, β is the coefficient of interest and ε_{it} is the disturbance term. To control for time-invariant state-specific heterogeneity, the state fixed-effects model is written as:

$$HDI_{it} = \alpha + \beta CFPI_{it} + \mu_i + \varepsilon_{it} \quad (15)$$

where μ_i denotes the state fixed effect. To control for common year-specific movements, the year fixed-effects model is:

$$HDI_{it} = \alpha + \beta CFPI_{it} + \lambda_t + \varepsilon_{it} \quad (16)$$

where λ_t denotes the year fixed effect. The preferred specification is the two-way fixed-effects model:

$$HDI_{it} = \alpha + \beta CFPI_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (17)$$

This model isolates within-state changes in HDI associated with within-state changes in CFPI after netting out both time-invariant state characteristics and common time effects. Three robustness checks are also employed. The first-difference specification is:

$$\Delta HDI_{it} = \alpha + \beta \Delta CFPI_{it} + \lambda_t + \varepsilon_{it} \quad (18)$$

The lagged model is:

$$HDI_{it} = \alpha + \beta CFPI_{it-1} + \mu_i + \lambda_t + \varepsilon_{it} \quad (19)$$

The logit transformation of HDI is:

$$\ln\left(\frac{HDI_{it}}{1 - HDI_{it}}\right) = \alpha + \beta CFPI_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (20)$$

The first-difference model examines whether changes in fiscal performance are associated with changes in human development. The lagged model tests whether the effect of fiscal performance appears with a delay. The logit model is used because HDI is bounded between 0 and 1. Standard errors are clustered at the state level to account for serial correlation and heteroskedasticity within states over time.

Research Hypothesis

The empirical hypothesis tested in the paper is:

$$H_0: \beta = 0 \quad (21)$$

$$H_1: \beta \neq 0 \quad (22)$$

A positive value of β would indicate that higher fiscal performance is associated with higher human development. However, the expected relationship need not be uniformly positive if fiscal adjustment takes place through compression of productive social expenditure rather than through stronger expenditure quality or revenue capacity.

Statistical Tests and Descriptive Tools

The empirical investigation includes descriptive statistics, quartile analysis, group-mean comparison, annual correlation analysis and correlation decomposition. Mean differences between special and non-special category states are tested through Welch's t-test, which does not require the assumption of equal group variances. Correlation decomposition is used to distinguish pooled, between-state, within-state and two-way within variation in the CFPI-HDI relationship.

Results and Discussion

All tables and figures here are computed from the state-level CFPI and HDI panel for 24 Indian states observed in 1995, 2000, 2005, 2010, 2015 and 2020. The CFPI series is derived from state fiscal indicators reported by the Reserve Bank of India and the HDI series is drawn from Human Development Reports.

Table 4. Mean Trend Values for All States

Year	Mean CFPI	Mean HDI
1995	42.072	0.488
2000	39.248	0.517
2005	40.369	0.567
2010	43.160	0.612
2015	43.613	0.659
2020	41.707	0.670

Source: Calculated from state-level CFPI and HDI data for 24 Indian states, 1995-2020.

Table 4 shows that average HDI increased steadily while mean CFPI moved irregularly across the same benchmark years. This pattern is similar to Raj, Gupta and Shrawan (2023), who report that human development and economic/fiscal performance across Indian states do not always move in a single uniform path

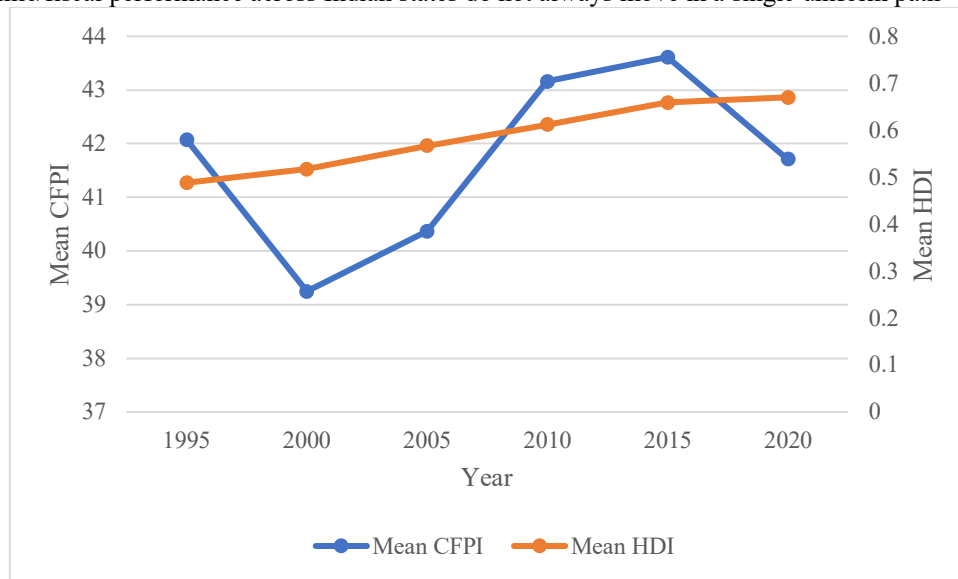
**Figure 1: Trend of Mean CFPI and Mean HDI for All States**

Figure 1 shows the same divergence visually: HDI follows a smooth upward line, whereas CFPI rises and falls across the period. This supports the argument of Anand and Ravallion (1993) that public services and human outcomes must be assessed beyond income or fiscal aggregates alone.

The mean value of HDI rises steadily from 0.488 in 1995 to 0.670 in 2020. This is a cumulative increase of 0.182 points over the sample period and indicates broad improvement in human development across states. Mean CFPI does not follow the same smooth path. It declines between 1995 and 2000, rises between 2000 and 2015 and declines again in 2020. The contrast between the two variables shows that human development improved steadily even when fiscal performance moved in a fluctuating pattern.

Table 5. Descriptive Statistics

Year	n	CFPI Mean	CFPI SD	CFPI Min	CFPI Max	HDI Mean	HDI SD	HDI Min	HDI Max
1995	24	42.072	6.426	26.801	53.080	0.488	0.049	0.402	0.578
2000	24	39.248	7.050	23.701	54.266	0.517	0.050	0.430	0.609
2005	24	40.369	6.974	28.783	56.103	0.567	0.062	0.465	0.690
2010	24	43.160	7.162	29.965	55.702	0.612	0.060	0.508	0.731
2015	24	43.613	7.246	32.129	56.506	0.659	0.055	0.558	0.763
2020	24	41.707	7.405	32.341	56.290	0.670	0.049	0.581	0.766

Source: Calculated from state-level CFPI and HDI data for 24 Indian states, 1995-2020.

Table 5 shows the annual dispersion of CFPI and HDI through the mean, standard deviation and range. The persistence of wide fiscal dispersion is similar to Mundle and Gupta (2024), while the narrowing HDI dispersion is close to the convergence evidence reported for Indian states by Saksena and Deb (2016).

The descriptive profile shows that fiscal performance remains substantially dispersed across states throughout the study period. CFPI standard deviation is always above 6 and the spread between minimum and maximum values is wide in every year. In 1995 the range runs from 26.801 to 53.080; in 2020 it still spans from 32.341 to 56.290. HDI behaves differently. Its standard deviation remains much lower, fluctuating between 0.049 and 0.062 and the minimum HDI rises continuously from 0.402 to 0.581. This indicates persistent interstate inequality in fiscal performance but convergence in human development.

Table 6. Group Means and Gaps (Special – Non-Special)

Year	CFPI Special Mean	CFPI Mean Non-Special	CFPI Gap	HDI Special Mean	HDI Mean Non-Special	HDI Gap
1995	48.549	38.185	10.364	0.503	0.479	0.023
2000	45.623	35.423	10.200	0.526	0.511	0.015
2005	46.514	36.682	9.832	0.571	0.564	0.007
2010	50.265	38.897	11.368	0.634	0.598	0.036
2015	51.404	38.939	12.465	0.671	0.652	0.020
2020	49.938	36.768	13.170	0.676	0.667	0.010

Source: Calculated from state-level CFPI and HDI data for special and non-special category states, 1995-2020.

Table 6 shows that special category states have a persistent CFPI advantage over non-special category states but only a small HDI advantage. This fits the special-category rationale of constrained resource bases and fiscal support needs, yet it also echoes Bhattacharjee (2014) and PRS Legislative Research (2020) that special-status fiscal arrangements do not automatically guarantee proportionate development outcomes

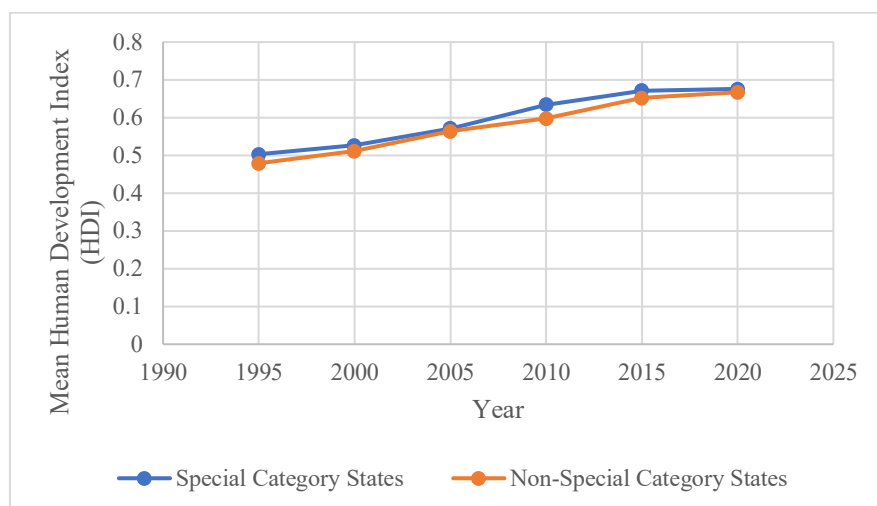


Figure 2. Trend of Mean HDI: Special vs Non-Special Category States, 1995-2020

Figure 2 shows that both special and non-special category states improved in mean HDI from 1995 to 2020, with a narrow gap between the two groups. The trend is consistent with evidence of declining HDI inequality and convergence across Indian states reported by Nag and Pradhan (2023) and Saksena and Deb (2016).

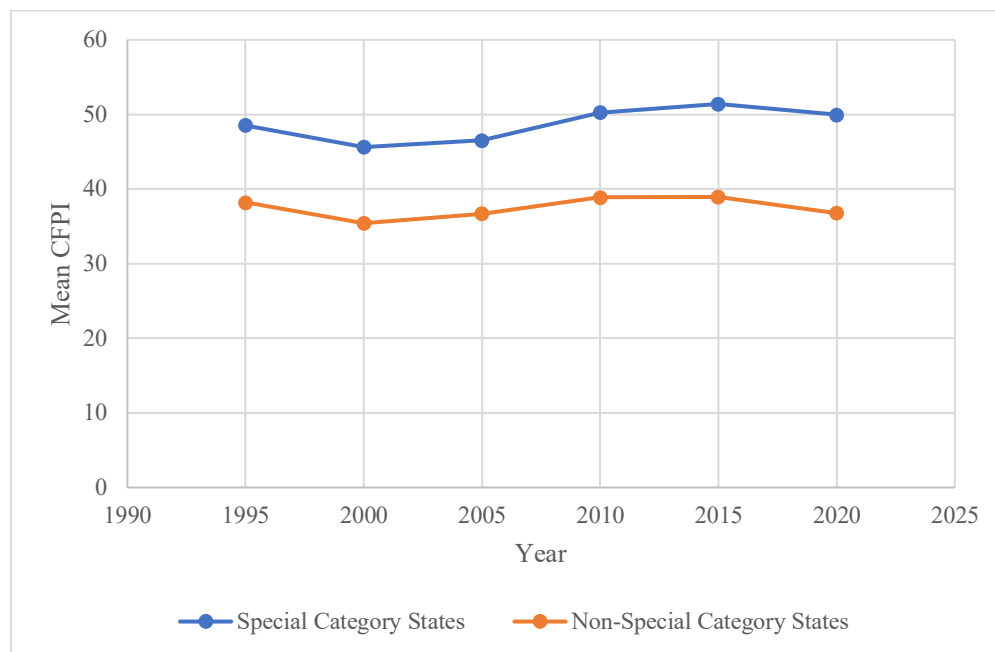


Figure 3. Trend of Mean CFPI: Special vs Non-Special Category States, 1995-2020

Figure 3 shows a persistent fiscal-performance gap in favour of special category states. This is consistent with the fiscal logic of special category treatment, where low resource bases and non-viable state finances justified differentiated support (Government of India, 2016; PRS Legislative Research, 2020).

Special category states record consistently higher CFPI than non-special category states in every observed year. The fiscal-performance gap is large, persistent and increases from 10.364 points in 1995 to 13.170 points in 2020. The pattern for HDI is much weaker. HDI differences are small in magnitude, fluctuate over time and do not move in proportion to the large fiscal gap. Thus, higher average fiscal performance at the group level does not translate automatically into a correspondingly higher human-development advantage.

Table 7. Mean Difference Significance Test (Welch t-test)

Year	Variable	Mean Special	Mean Non-Special	Mean Diff (S-N)	t-stat	p-value
1995	CFPI	48.549	38.185	10.364	6.221	<0.001
1995	HDI	0.503	0.479	0.023	1.236	0.2298
2000	CFPI	45.623	35.423	10.200	4.614	0.0003
2000	HDI	0.526	0.511	0.015	0.788	0.4391
2005	CFPI	46.514	36.682	9.832	4.454	0.0004
2005	HDI	0.571	0.564	0.007	0.320	0.7521
2010	CFPI	50.265	38.897	11.368	6.226	<0.001
2010	HDI	0.634	0.598	0.036	1.648	0.1135
2015	CFPI	51.404	38.939	12.465	7.800	<0.001
2015	HDI	0.671	0.652	0.020	0.978	0.3385
2020	CFPI	49.938	36.768	13.170	7.724	<0.001
2020	HDI	0.676	0.667	0.010	0.516	0.6109

Source: Calculated using Welch's unequal-variance t-test on state-level CFPI and HDI values. p-values below 0.001 are reported as <0.001.

Table 7 shows the Welch t-test comparison between special and non-special category states for CFPI and HDI. The use of Welch's unequal-variance test is appropriate here because it does not require equal group variances, following the statistical approach developed by Welch (1947). The t-test results show that the difference in CFPI between the two groups is statistically significant in every year. The HDI differences are not statistically significant in any year. This strengthens the earlier conclusion that the fiscal-performance advantage of special category states does not yield a statistically comparable human-development advantage.

Table 8. Quartiles and Interquartile Range

Year	Variable	Q1	Median	Q3	IQR
1995	CFPI	37.756	40.732	47.090	9.334
1995	HDI	0.445	0.488	0.527	0.082
2000	CFPI	34.600	38.313	42.321	7.721
2000	HDI	0.473	0.520	0.552	0.080
2005	CFPI	35.212	40.351	46.042	10.830
2005	HDI	0.526	0.559	0.597	0.071
2010	CFPI	36.612	41.435	49.313	12.701
2010	HDI	0.565	0.621	0.652	0.086
2015	CFPI	38.111	40.923	48.522	10.411
2015	HDI	0.618	0.663	0.696	0.078
2020	CFPI	36.542	39.949	48.563	12.021
2020	HDI	0.639	0.678	0.702	0.063

Source: Calculated from state-level CFPI and HDI data for 24 Indian states, 1995-2020.

Table 8 shows quartiles and interquartile range for CFPI and HDI, making it possible to compare the middle-spread of states rather than only the extreme values. The decline in HDI IQR is similar to the state-level human-development convergence documented by Raj, Gupta and Shrawan (2023) and Nag and Pradhan (2023). The interquartile range of HDI declines from 0.082 in 1995 to 0.063 in 2020, indicating that the middle half of states became more similar in human development over time. The IQR of CFPI remains much larger and even widens in later years.

Table 9. Correlation between CFPI and HDI by Year

Year	Corr(CFPI, HDI)
1995	0.306
2000	0.300
2005	0.173
2010	0.294
2015	0.184
2020	0.013

Source: Calculated from cross-sectional state-level CFPI and HDI observations for each sample year.

Table 9 shows the yearly correlation between CFPI and HDI, with the association weakening sharply by 2020. This weak contemporaneous link is consistent with Filmer and Pritchett (1999), who show that public spending indicators may have limited impact when delivery and governance conditions are weak

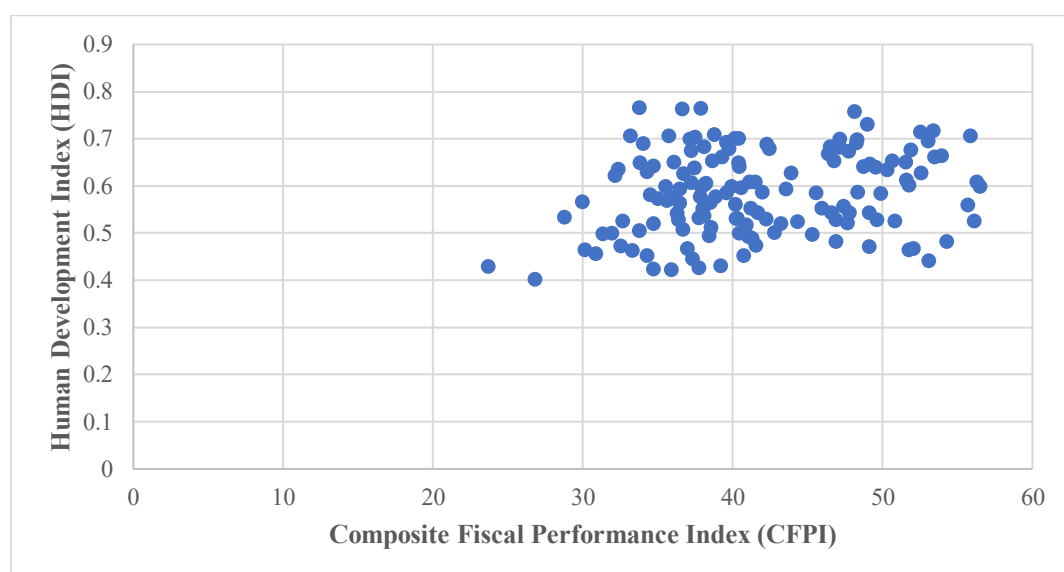
**Figure 4. Scatter Plot of CFPI and HDI, Pooled State-Years, 1995-2020**

Figure 4 shows the pooled scatter of CFPI and HDI across all state-years, where the cloud is only mildly upward sloping and widely dispersed. This supports Gupta, Verhoeven and Tiongson (2002), who stress that public spending can improve education and health outcomes but the effect depends on expenditure effectiveness.

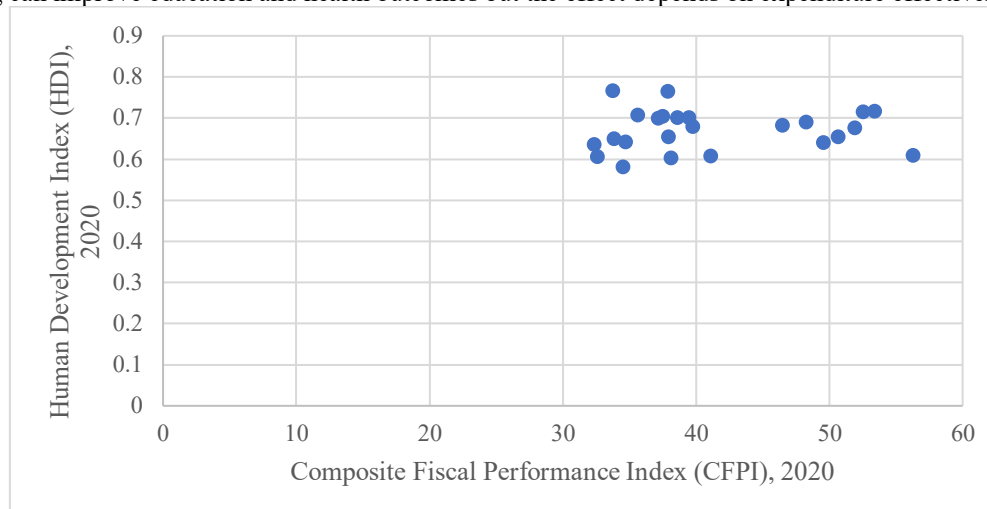


Figure 5. Scatter Plot of CFPI and HDI, 2020 Cross-Section

Figure 5 shows that the 2020 cross-section has almost no visible positive association between CFPI and HDI. This result is consistent with Mohanty and Bhanumurthy (2018), who find wide inter-state variation in public-expenditure efficiency, especially across education, health and the social sector. The annual correlations are modestly positive in the earlier years but the relationship weakens over time and becomes almost zero by 2020. The 2020 correlation of 0.013 indicates virtually no contemporaneous cross-sectional association between fiscal performance and human development in that year.

Table 10. Correlation Decomposition

Correlation Type	Corr(CFPI, HDI)
Pooled correlation (all state-years)	0.218
Between correlation (state means)	0.234
Within correlation (demeaned by state)	0.284
Two-way within correlation (demeaned by state and year)	-0.068

Source: Calculated from the state-level panel using pooled, between, within and two-way within transformations.

Table 10 shows that the positive pooled and between-state correlations disappear after both state and year effects are removed. This interpretation follows standard panel-data logic, where fixed effects separate cross-sectional differences from within-unit changes over time (Wooldridge, 2010). The pooled correlation is positive and the between-state correlation is also positive, which means that states with higher average fiscal performance tend to have higher average HDI. However, after demeaning by both state and year, the remaining two-way within correlation becomes -0.068 . This implies that once cross-state heterogeneity and common time effects are removed, the residual CFPI-HDI relationship is weak and slightly negative.

Table 11. Regression Results with Cluster-Robust Standard Errors at the State Level

Model	Specification	Coefficient on CFPI	Clustered SE	t-stat	p-value	R ²	N
(1)	Pooled OLS	0.002664	0.001601	1.664	0.0961	0.0473	144
(2)	Year fixed effects	0.001613	0.001478	1.091	0.2751	0.6370	144
(3)	State fixed effects	0.007197	0.002086	3.450	0.0006	0.4092	144
(4)	State and year fixed effects	-0.000386	0.000652	-0.591	0.5544	0.9777	144
(5)	First difference + year fixed effects	-0.000259	0.000695	-0.373	0.7094	0.3966	120
(6)	Lagged CFPI + state and year fixed effects	0.000194	0.000725	0.267	0.7891	0.9726	120

(7)	Logit(HDI) + state and year fixed effects	-0.002419	0.002983	-0.811	0.4173	0.9762	144
-----	---	-----------	----------	--------	--------	--------	-----

Notes: Clustered standard errors are reported at the state level. Model (5) uses ΔHDI and ΔCFPI . Model (6) uses one-period lagged CFPI. Model (7) uses $\ln\left(\frac{\text{HDI}}{1-\text{HDI}}\right)$ as the dependent variable. Source: state-level panel of CFPI and HDI values for 24 states, 1995-2020.

Table 11 shows that the pooled and one-way fixed-effect associations are not robust in the preferred state-and-year fixed-effects model. The use of clustered standard errors at the state level follows Cameron and Miller (2015), who recommend cluster-robust inference when errors may be correlated within units over time. The pooled OLS coefficient is positive, indicating that a one-point increase in CFPI is associated with a 0.002664 increase in HDI. A ten-point increase in CFPI therefore corresponds to approximately 0.0266 higher HDI in the pooled model. However, once year fixed effects are included, the coefficient becomes smaller and statistically insignificant. When only state fixed effects are included, the coefficient becomes larger and statistically significant, indicating that states with higher average fiscal performance tend also to have higher average HDI. This is a between-state pattern rather than a strict within-state effect. The preferred two-way fixed-effects shows changes the picture decisively. In Model (4), the coefficient on CFPI is -0.000386 with a p-value of 0.5544. This means that after controlling for state-specific and year-specific effects, within-state changes in CFPI do not have a statistically significant association with within-state changes in HDI. In practical terms, a ten-point increase in CFPI is associated with only -0.0039 in HDI, which is both economically small and statistically insignificant. The robustness checks lead to the same conclusion. The first-difference model, the lagged model and the logit-transformed model all produce insignificant coefficients.

Table 12. Group-Wise Regression

Model	Group	Coefficient on CFPI	Clustered SE	t-stat	p-value	R ²	N
(1)	Pooled OLS, special category states	0.001397	0.003212	0.435	0.6636	0.0075	54
(2)	Pooled OLS, non-special category states	0.006127	0.002873	2.133	0.0329	0.0852	90
(3)	State and year fixed effects, special category states	-0.000866	0.001708	-0.507	0.6120	0.9689	54
(4)	State and year fixed effects, non-special category states	-0.000267	0.000636	-0.419	0.6751	0.9852	90

Source: Results separately for special and non-special category state panels using cluster-robust standard errors at the state level.

Table 12 shows that the pooled positive association for non-special category states disappears after state and year fixed effects are included. This reinforces the panel-data result that group-specific cross-sectional association should not be read as a within-state causal effect (Wooldridge, 2010; Cameron and Miller, 2015). The pooled positive association is stronger among non-special category states, where the coefficient is 0.006127 and statistically significant at the 5 percent level. For special category states, even the pooled coefficient is small and insignificant. Once the two-way fixed-effects structure is imposed, both coefficients become negative and statistically insignificant. The disappearance of the pooled positive association therefore occurs in both groups.

Table 13. State-Level Mean HDI and Mean CFPI, 1995-2020

State	Group	Mean HDI	Mean CFPI
Goa	Non-special category	0.685	43.618
Kerala	Non-special category	0.679	36.889
Punjab	Non-special category	0.643	35.301
Himachal Pradesh	Special category	0.639	52.021
Mizoram	Special category	0.636	41.622
Manipur	Special category	0.622	46.120
Sikkim	Special category	0.619	50.560
Maharashtra	Non-special category	0.616	39.129
Tamil Nadu	Non-special category	0.611	39.370
Haryana	Non-special category	0.609	41.673
Nagaland	Special category	0.604	44.601

Karnataka	Non-special category	0.604	39.869
Gujarat	Non-special category	0.581	37.651
Arunachal Pradesh	Special category	0.578	49.286
Tripura	Special category	0.576	48.182
Meghalaya	Special category	0.564	50.721
West Bengal	Non-special category	0.554	32.019
Andhra Pradesh	Non-special category	0.549	34.239
Assam	Special category	0.536	55.324
Rajasthan	Non-special category	0.534	35.775
Madhya Pradesh	Non-special category	0.521	36.581
Odisha	Non-special category	0.515	41.718
Uttar Pradesh	Non-special category	0.514	35.083
Bihar	Non-special category	0.491	31.657

Source: Calculated as state-wise averages of HDI and CFPI over 1995-2020.

Table 13 shows that states with high mean HDI do not always have high mean CFPI, as seen in Kerala and Goa, while Assam records high CFPI with lower HDI. This is close to Drèze and Sen's (2013) argument that social provisioning and institutional quality can matter more for welfare than fiscal strength alone. The state averages show clearly that high fiscal-performance levels do not automatically imply high human-development levels. Goa and Kerala occupy the top positions in average HDI with only moderate CFPI values. Assam has the highest average CFPI in the sample, yet its average HDI remains far below the top-performing human-development states. Himachal Pradesh and Sikkim combine high CFPI with strong HDI but this pattern is not universal across the sample. The state profile therefore supports the broader conclusion that fiscal performance and human development do not move together in a simple one-to-one way.

Table 14. State Changes between 1995 and 2020

State	Group	HDI (1995)	HDI (2020)	ΔHDI	% ΔHDI	CFPI (1995)	CFPI (2020)	$\Delta CFPI$
Rajasthan	Non-special category	0.431	0.650	0.219	50.81	39.205	33.825	-5.380
Arunachal Pradesh	Special category	0.467	0.677	0.210	44.97	52.041	51.907	-0.134
Karnataka	Non-special category	0.474	0.679	0.205	43.25	41.540	39.756	-1.784
Haryana	Non-special category	0.501	0.704	0.203	40.52	42.799	37.489	-5.310
Kerala	Non-special category	0.565	0.766	0.201	35.58	38.505	33.751	-4.754
Tamil Nadu	Non-special category	0.500	0.699	0.199	39.80	40.417	37.160	-3.257
Andhra Pradesh	Non-special category	0.446	0.642	0.196	43.95	37.315	34.689	-2.626
Himachal Pradesh	Special category	0.526	0.717	0.191	36.31	50.804	53.373	2.569
Meghalaya	Special category	0.465	0.654	0.189	40.65	51.761	50.668	-1.093
Goa	Non-special category	0.578	0.765	0.187	32.35	38.842	37.870	-0.972
Maharashtra	Non-special category	0.521	0.701	0.180	34.55	43.211	39.440	-3.771
Bihar	Non-special category	0.402	0.581	0.179	44.53	26.801	34.488	7.687
Punjab	Non-special category	0.533	0.707	0.174	32.65	37.761	33.165	-4.596
Sikkim	Special category	0.543	0.715	0.172	31.68	47.781	52.542	4.761

Manipur	Special category	0.522	0.691	0.169	32.38	47.654	48.234	0.579
West Bengal	Non-special category	0.468	0.636	0.168	35.90	36.960	32.341	-4.620
Assam	Special category	0.442	0.609	0.167	37.78	53.080	56.290	3.210
Gujarat	Non-special category	0.493	0.654	0.161	32.66	39.608	37.945	-1.664
Madhya Pradesh	Non-special category	0.427	0.607	0.180	42.15	37.742	32.604	-5.138
Odisha	Non-special category	0.424	0.608	0.184	43.40	34.708	41.112	6.404
Uttar Pradesh	Non-special category	0.423	0.603	0.180	42.55	35.926	38.123	2.197
Tripura	Special category	0.483	0.640	0.157	32.51	46.902	49.550	2.648
Mizoram	Special category	0.544	0.701	0.157	28.86	46.594	38.572	-8.022
Nagaland	Special category	0.531	0.683	0.152	28.63	40.325	46.494	6.169

Source: Calculated from state-wise CFPI and HDI values for 1995 and 2020.

Table 14 shows state-wise changes between 1995 and 2020, where every state improves in HDI even though CFPI increases in some states and declines in others. This mixed pattern is consistent with Ranis, Stewart and Ramirez (2000), who describe human development as linked to broader growth and policy channels rather than one fiscal indicator alone

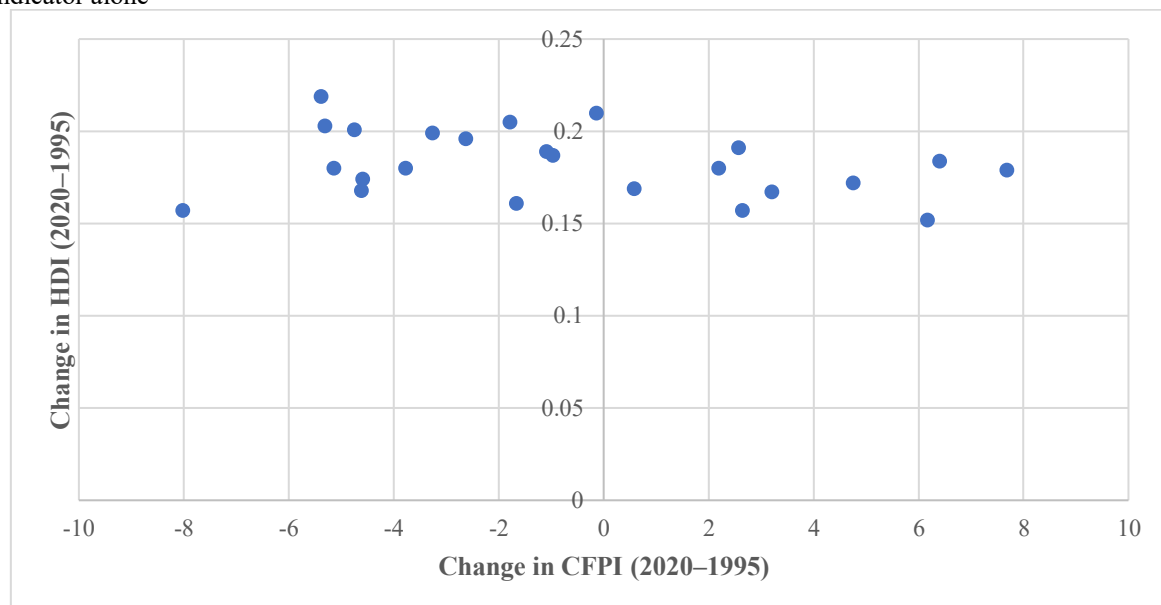


Figure 6. Change in HDI (2020–1995) versus Change in CFPI

Figure 6 shows that HDI gains are positive across all states while CFPI changes are scattered around zero. This supports the expenditure-quality argument in Filmer and Pritchett (1999) and Gupta, Verhoeven and Tiongson (2002), where fiscal resources influence human outcomes only when translated effectively into services. Every state records an increase in HDI between 1995 and 2020 but CFPI does not move uniformly in the same direction. Rajasthan records the largest HDI gain, 0.219, despite a 5.380-point decline in CFPI. Kerala gains 0.201 in HDI while its CFPI falls by 4.754 points. Bihar, Odisha and Nagaland show increases in CFPI but their HDI gains are not proportionately greater than those in states where CFPI declined. This state-level pattern supports the regression result that improvements in fiscal performance do not automatically translate into larger improvements in human development.

Discussion

The descriptive results, the correlation analysis and the regression all point to the same broad conclusion. Human development improved steadily across states during 1995-2020, whereas fiscal performance remained far more uneven and cyclical. The pooled data show a weakly positive association between CFPI and HDI but this association is not robust once time effects and state effects are controlled. The positive pooled result therefore reflects a mixture of interstate differences and the common upward trend in HDI rather than a clean within-state effect of fiscal performance on human development. The evidence suggests that fiscal performance in aggregate form does not by itself capture the whole mechanism through which human development changes. A state can improve its deficit position or debt indicators without necessarily improving the composition and quality of spending in education, health and basic services. Conversely, a state may continue to improve HDI because of long-run social investments, institutional capacity and broader development processes even when the composite fiscal-performance score weakens.

Conclusion

The study examined the relationship between fiscal performance and human development across 24 Indian states over the period 1995-2020 by using a balanced panel observed at five-year intervals. Human development was measured through HDI and fiscal performance through CFPI. The mean trend analysis showed continuous improvement in HDI over the entire study period, whereas CFPI fluctuated and remained widely dispersed across states. Special category states consistently recorded higher average CFPI than non-special category states but the corresponding HDI advantage was small and statistically insignificant. The pooled regression suggested a weak positive association between fiscal performance and human development. However, once state fixed effects and year fixed effects were introduced, the coefficient on CFPI became very small and statistically insignificant. The first-difference model, lagged model and logit-transformed model produced the same substantive conclusion. Separate regressions for special and non-special category states also showed that the positive pooled association disappears after controlling for fixed effects. The evidence therefore indicates that within-state changes in fiscal performance do not exert a statistically significant independent effect on HDI in this panel. The main implication is that stronger fiscal outcomes, taken in aggregate, are not sufficient by themselves to guarantee stronger human-development outcomes. What matters is how fiscal space is translated into development-oriented expenditure, social-sector continuity, service-delivery quality and broader institutional effectiveness. Fiscal improvement remains important but its human-development payoff depends on composition, quality and implementation rather than on the composite score alone.

..

References

1. Anand, S., & Ravallion, M. (1993). Human development in poor countries. *Journal of Economic Perspectives*, 7(1), 133–150.
2. Bahal, G. (2025). Debt sustainability in Indian states: A fiscal R analysis* (pp. 2-3). Indian Economic Service. <https://www.ies.gov.in/pdfs/Pavit-march25.pdf>
3. Bhattacharjee, G. (2014). The reality of special category states. *Economic and Political Weekly*, 49(6), 51-58. <https://www.jstor.org/stable/24480823>
4. Cameron, A. C., & Miller, D. L. (2015). A practitioner's guide to cluster-robust inference. *Journal of Human Resources*, 50(2), 317-372. <https://doi.org/10.3368/jhr.50.2.317>
5. Chakrabarty, T. (2024). State of State Finances 2024-25 (pp. 3-4). PRS Legislative Research. https://prsindia.org/files/budget/State_of_State_Finances-2024-25.pdf
6. Chakraborty, P. (2024). State finances in India: Managing fiscal risks and navigating emerging challenges (Working Paper No. 413, pp. 5-8). National Institute of Public Finance and Policy. https://www.nipfp.org.in/media/medialibrary/2024/07/WP_413_2024.pdf
7. CSEP. (2022). Fiscal federalism in India (pp. 2-4). Centre for Social and Economic Progress. <https://www.theindiaforum.in/article/fiscal-federalism-india>
8. Devan, V. V. (2025). The evolution of fiscal federalism in India (pp. 1-5). GIFT Research. https://www.gift.res.in/wp-content/uploads/2025/11/The-Evolution-of-Fiscal-Federalism-in-India_John-Dickinson.pdf
9. Drèze, J., & Sen, A. (2013). *An uncertain glory: India and its contradictions*. Princeton University Press.
10. Filmer, D., & Pritchett, L. (1999). The impact of public spending on health: Does money matter? *Social Science & Medicine*, 49(10), 1309–1323.

11. Finance Commission. (2021). Report of the Fifteenth Finance Commission (2021-26) (pp. 1-3). PRS India. <https://prsindia.org/policy/report-summaries/report-15th-finance-commission-2021-26>
12. Government of India. (2016). Special Category Status to States: Lok Sabha Unstarred Question No. 1924. Ministry of Planning. <https://sansad.in/getFile/loksabhaquestions/annex/14/AU1924.pdf?source=pqals>
13. Gupta, S., Verhoeven, M., & Tiongson, E. R. (2002). The effectiveness of government spending on education and health care in developing and transition economies. *European Journal of Political Economy*, 18(4), 717–737.
14. Hooda, S. K. (2015). Determinants of public expenditure on health in India. ISID Working Paper.
15. IJSDR. (2024). Income disparities in India: A comparative macro-level analysis (pp. 640-642). <https://www.ijedr.org/papers/IJSDR2401091.pdf>
16. Jha, R., & Bali, A. S. (2023). India's Goods and Services Tax: Context, design and policy spillovers (ASARC Working Paper 2023/02, pp. 1-3, 20). Australian National University. <https://crawford.anu.edu.au/sites/default/files/2025-03/gst-paper.pdf>
17. Kumar, R. (2024). Inter-state disparities in public expenditure on primary education in India (pp. 125-126). *Journal of Business Management and Information Systems*. <https://www.researchgate.net/publication/384632243>
18. Kushwaha, M. (2020). A causal relationship between public expenditure on education and human development: Analysis of Indian states.
19. Mehrotra, S., & Parida, J. K. (2023). Economic growth and human development in India: Are states converging? (pp. 5-6, 21). Centre for Social and Economic Progress. <https://csep.org/wp-content/uploads/2023/06/Economic-Growth-HD-in-India-2.pdf>
20. Mohanty, R. K. (2018). Assessing public expenditure efficiency at Indian states. NIPFP Working Paper No. 225.
21. Mohanty, R. K., & Bhanumurthy, N. R. (2018). Assessing public expenditure efficiency at Indian states (Working Paper No. 225, pp. 2-3, 27-28). National Institute of Public Finance and Policy. https://www.nipfp.org.in/media/medialibrary/2018/03/WP_2018_225.pdf
22. Mundle, S., & Gupta, M. (2024). Fiscal performance of the Central government and the States of India (Working Paper No. 412). National Institute of Public Finance and Policy. https://www.nipfp.org.in/media/documents/WP_412_2024.pdf
23. Nag, A., & Pradhan, J. (2023). Does club convergence matter? Empirical evidence on inequality in the human development index among Indian states. *Humanities and Social Sciences Communications*, 10, Article 25. <https://doi.org/10.1057/s41599-023-01518-z>
24. NITI Aayog. (2025). Fiscal Health Index 2025. Government of India.
25. PRS Legislative Research. (2020). Special Category status and centre-state finances. <https://prsindia.org/theprsblog/special-category-status-and-centre-state-finances>
26. Raj, J., Gupta, V., & Shrawan, A. (2023). Economic Growth and Human Development in India: Are States Converging? (CSEP Working Paper 51). Centre for Social and Economic Progress. <https://csep.org/wp-content/uploads/2023/06/Economic-Growth-HD-in-India-1.pdf>
27. Raj, J., Ranjan, R., Gupta, V., & Shrawan, A. (2024). Fiscal transfers from the Union to states and healthcare in India (CSEP Working Paper 76, p. 9). Centre for Social and Economic Progress. <https://csep.org/wp-content/uploads/2024/06/Fiscal-Transfers-from-the-Union-to-States-and-Healthcare-in-India-1.pdf>
28. Ranis, G., Stewart, F., & Ramirez, A. (2000). Economic growth and human development. *World Development*, 28(2), 197–219.
29. Rao, M. G. (2011). Federalism and fiscal reform in India (Working Paper No. 84, pp. 3-5). NIPFP. https://www.nipfp.org.in/media/medialibrary/2013/04/wp_2011_84.pdf
30. Reddy, Y. V., Reddy, G. R., & Chakraborty, P. (2025). Indian fiscal federalism (pp. 19-42). Oxford University Press. <https://academic.oup.com/book/61740/chapter/542468781>
31. Saksena, S., & Deb, M. (2016). Economic growth and human development in Indian states after two decades of economic reforms (MPRA Paper No. 71128). Munich Personal RePEc Archive. https://mpra.ub.uni-muenchen.de/71128/1/MPRA_paper_71128.pdf
32. Sen, A. (1999). Development as freedom. Oxford University Press.

33. Sharma, P. (2025). Inter-state disparities: A challenge ahead to inclusive growth of India (pp. 2-3). Academia. <https://www.academia.edu/34431903>
34. Shodhsamagam. (2025). Regional disparities in economic growth across Indian states (pp. 4-5). https://shodhsamagam.com/uploads/issues_tbl/1761569662egional-Disparities-in-Economic-Growth-across-Indian-States.pdf
35. UNDP. (n.d.). Human Development Index (HDI). Human Development Reports. <https://hdr.undp.org/data-center/human-development-index>
36. Varughese, A. R., & Aswathy, R. (2024). An interstate analysis of vertical fiscal imbalance in India (pp. 6-7). https://www.gift.res.in/wp-content/uploads/2024/06/An_interstate_analysis_of_vertical_fiscal_imbalance_in_India__Surya_K__Aswathy_Rachel_Varughese4.pdf
37. Vision IAS. (2024). Fiscal federalism in India (pp. 1-2). <https://visionias.in/current-affairs/monthly-magazine/2024-05-21/polity-and-governance/fiscal-federalism>
38. Welch, B. L. (1947). The generalization of Student's problem when several different population variances are involved. *Biometrika*, 34(1-2), 28-35. <https://doi.org/10.1093/biomet/34.1-2.28>
39. Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data* (2nd ed.). MIT Press. <https://mitpress.mit.edu/9780262232586/econometric-analysis-of-cross-section-and-panel-data/>
40. Yaqub, S. B. M. (2025). Relationship between social sector expenditure and human development in India. Indian Economic Service.