



FISCAL HEALTH AND SUSTAINABLE DEVELOPMENT PERFORMANCE ACROSS 18 MAJOR INDIAN STATES: EVIDENCE FROM THE NITI AAYOG FISCAL HEALTH INDEX

An Exploratory Cross-Sectional Comparison

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ABSTRACT

DOI No: 10.36713/epra29020

Article DOI: <https://doi.org/10.36713/epra29020>

This exploratory cross-sectional study examines the relationship between state-level fiscal health and sustainable development performance across the 18 major Indian states covered by the NITI Aayog Fiscal Health Index (FHI) 2025. The analysis combines FHI 2025 with the SDG India Index 2023–24 and the National Multidimensional Poverty Index headcount ratio 2023. While the second FHI edition (FHI 2026) was released on 11 March 2026, the present study uses FHI 2025 as the baseline fiscal benchmark, with FHI 2026 presented as a supplementary temporal check.

The results reveal substantial divergence between fiscal health and sustainable development rankings. Spearman's rank correlation between FHI 2025 and SDG scores is negative but not statistically significant ($p = -0.319$, $p = 0.197$; 95% bootstrap CI: -0.72 to 0.18). Differences in mean SDG scores across FHI categories are also not statistically significant ($F(3,14) = 0.923$, $p = 0.455$). Among the five FHI sub-indices, Quality of Expenditure exhibits the largest absolute rank correlation with SDG scores ($\rho = -0.669$, $p = 0.002$), surviving the Bonferroni adjustment for the five sub-index correlations (adjusted $\alpha = 0.01$); however, this relationship is exploratory and does not imply that expenditure composition causes weaker development outcomes.

An exploratory Fiscal–Development Alignment Framework identifies four relative configurations: Development Strength with Lower Fiscal Health, High Fiscal Health and High SDG Performance, Fiscal–Development Divergence, and Relative Weakness on Both Dimensions. The findings indicate that fiscal health and sustainable development performance represent distinct dimensions of state performance. The study does not establish causality and is limited by its small cross-sectional sample and non-identical reference periods. The results support complementary monitoring of fiscal conditions and development outcomes rather than treating fiscal health as a proxy for overall state development. Accordingly, H_1 and H_2 are not supported by the empirical evidence.

KEYWORDS: *Fiscal Health Index; Sustainable Development; State Finance; Fiscal Federalism; NITI Aayog; Indian States; Multidimensional Poverty*

1. INTRODUCTION

1.1 Background and Context

Indian states occupy a central position in public expenditure and service delivery, yet fiscal performance varies substantially across states. State governments account for close to two-thirds of general government expenditure and around one-third of general government revenues. Consequently, the fiscal performance of states has important implications for macroeconomic stability, public investment, social service delivery, and region-specific development.

Recognising the importance of state finances, NITI Aayog launched the inaugural Fiscal Health Index (FHI) 2025 on 24 January 2025. The index provides a structured framework for assessing the fiscal performance of 18 major states using five dimensions: Quality of Expenditure, Revenue Mobilisation, Fiscal Prudence, Debt Index, and Debt Sustainability. The FHI is intended to strengthen evidence-based assessment of state finances and encourage improvements in fiscal governance, fiscal resilience, and public financial management.

The subsequent FHI 2026, covering FY 2023–24, was released on 11 March 2026. It retained the 18 major states while

extending the framework to 10 North-Eastern and Himalayan states, assessed separately to account for their distinctive structural and fiscal characteristics.

Fiscal health can provide an enabling fiscal environment for public expenditure and service delivery; sustainable development is an outcome-oriented multidimensional domain. Therefore, correspondence between the two should be an empirical question rather than an assumption. This is the central intellectual justification for the paper.

1.2 The Central Empirical Puzzle

Among the 18 major states, Odisha records the highest FHI 2025 score of 67.8, followed by Chhattisgarh (55.2), Goa (53.6), Jharkhand (51.6), and Gujarat (50.5). The FHI report identifies these states as the highest-ranked performers on the composite fiscal health measure.

However, states with stronger fiscal performance do not uniformly rank highly on sustainable development outcomes. In the SDG India Index 2023–24, Kerala and Uttarakhand jointly record the highest score of 79, followed by Tamil Nadu with 78 and Goa with 77. Within the 18-state analytical sample, Kerala and Tamil Nadu represent strong sustainable development performers despite their comparatively lower FHI scores of 25.4 and 29.2, respectively.

This contrast—Odisha leading in fiscal health but lagging in development, and Kerala achieving high development despite weak fiscal health—establishes why the research question matters. Odisha ranks first in FHI 2025 but 16th among the 18 states in the SDG Index. Kerala ranks first within the 18-state sample on SDG performance (joint-first nationally with Uttarakhand at 79) but only 15th on FHI 2025. The National Multidimensional Poverty Index 2023 shows substantial interstate variation, further indicating that fiscal performance and sustainable development outcomes need not move together.

This divergence motivates a systematic examination of the relationship between fiscal health and development performance.

RQ: To what extent does the cross-state ranking of fiscal health correspond to the ranking of sustainable development performance among the 18 major states?

1.3 Research Hypotheses and Questions

The study examines the following research propositions and questions:

H₁: Fiscal-health rankings are significantly associated with sustainable-development rankings across the 18 major states (two-tailed test). The hypothesis is about association, not direction or causality.

RQ₁: How are the five FHI sub-indices associated with sustainable-development performance across the 18 major states?

H₂: Mean SDG scores differ significantly across the four FHI performance categories.

H₁ is assessed using Spearman's rank correlation, while H₂ is examined through comparisons of SDG scores across FHI categories. RQ₁ is examined descriptively through sub-index

correlations. Formal tests of equality of correlation coefficients are not conducted due to the small sample size (N = 18).

1.4 Contributions of the Study

This study makes four contributions. First, it provides a systematic cross-sectional comparison of fiscal health and sustainable development performance across 18 major Indian states using official Government of India indices. Second, it distinguishes fiscal health from development outcomes rather than treating fiscal performance as a proxy for broader state performance. Third, it examines both the aggregate FHI and its constituent sub-indices, allowing potentially heterogeneous associations to be identified. Fourth, it subjects the principal relationships to multiple robustness checks, including alternative group-comparison procedures, multiple-testing adjustment, leave-one-state-out analysis, and a temporal comparison of FHI editions.

1.5 Paper Structure

Section 2 reviews the literature and develops the conceptual framework. Section 3 describes the data and methodology. Section 4 presents the empirical results. Section 5 discusses the patterns of fiscal–development divergence and alignment. Section 6 concludes with policy implications and directions for future research.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Fiscal Federalism and Subnational Fiscal Capacity

The theoretical foundations of fiscal federalism provide an essential backdrop for understanding state-level fiscal health. Musgrave (1959) and Oates (1972) established the normative framework for assigning expenditure responsibilities and revenue-raising powers across levels of government, emphasising that decentralisation can improve allocative efficiency when appropriately matched with revenue instruments.

Rodden (2002) highlighted the importance of intergovernmental transfers, borrowing arrangements, and institutional incentives in shaping subnational fiscal behaviour. Weingast (2009), through the second-generation fiscal federalism framework, emphasised the role of political and institutional incentives. These perspectives are particularly relevant to India, where states exercise substantial expenditure responsibilities within a system characterised by significant vertical fiscal imbalances.

Taken together, these perspectives imply that subnational fiscal outcomes depend not only on revenue capacity but also on intergovernmental incentives, borrowing constraints and expenditure responsibilities.

In India, the fiscal architecture is shaped by the Constitution, the Seventh Schedule, and successive Finance Commissions. State fiscal capacity depends on own-source revenue mobilisation, intergovernmental transfers, and the broader macro-fiscal environment. Rao (2002) examined the challenges of state-level fiscal reforms within this federal structure.

2.2 Theoretical Expectations: Competing Perspectives

The literature suggests three competing expectations regarding the fiscal–development relationship:

Expectation 1 – Fiscal capacity argument: Better fiscal health creates greater fiscal space, enabling higher public investment and better development outcomes.

Expectation 2 – Fiscal consolidation trade-off: Fiscal consolidation may reduce current expenditure, potentially weakening short-run development outcomes.

Expectation 3 – No necessary relationship: Historical human-capital investment, committed expenditure, and institutional factors may decouple fiscal health from development outcomes.

These three expectations yield distinct empirical predictions. Expectation 1 predicts a positive cross-state association; Expectation 2 predicts a negative association; Expectation 3 predicts no systematic association. This study empirically examines which pattern characterises the 18 major Indian states, providing a useful framework for interpreting the empirical result.

2.3 Fiscal Sustainability and Fiscal Health

Fiscal sustainability depends on the government's ability to service liabilities through future fiscal resources without generating unsustainable debt dynamics (Buiter, 1985; Blanchard, 1990). Ghosh et al. (2013) developed the concept of fiscal space—the limits within which governments can expand borrowing without generating significant fiscal stress.

In India, fiscal responsibility legislation has provided an institutional framework for fiscal consolidation. The Reserve Bank of India's annual publication, *State Finances: A Study of Budgets*, provides comprehensive state-level fiscal assessment. The RBI's 2024 assessment reported that state governments contained their consolidated gross fiscal deficit within 3 per cent of GDP during 2022–23 and 2023–24.

Against this background, the FHI provides a composite framework comparing fiscal performance across states, intended primarily as a diagnostic and benchmarking instrument rather than a direct measure of broader development.

2.4 Public Expenditure and Development

The relationship between public expenditure composition and development has been extensively examined. Devarajan, Swaroop, and Zou (1996) demonstrated that expenditure composition influences growth outcomes. Gupta, Verhoeven, and Tiongson (2002) examined the relationship between public spending and social outcomes in developing countries. Anand and Ravallion (1993) established important links between public expenditure, poverty, and human development.

Crucially, the literature distinguishes between expenditure quantity, expenditure composition, expenditure effectiveness, and development outcomes. The FHI's Quality of Expenditure sub-index measures expenditure composition rather than expenditure effectiveness.

In the Indian context, the SDG India Index provides a state-level framework for monitoring progress towards the Sustainable Development Goals. India's overall SDG score increased from 57 in 2018 to 71 in 2023–24. The National Multidimensional Poverty Index (MPI) provides a complementary measure of deprivation, with the headcount

ratio declining from 24.85 per cent (NFHS-4, 2015-16) to 14.96 per cent (NFHS-5, 2019-21).

2.5 Research Gap

Three gaps motivate this study:

1. **Measurement Gap:** The FHI is a recently introduced annual fiscal-health benchmarking framework, with its inaugural edition published in January 2025 and its second edition published on 11 March 2026. Published systematic empirical evidence linking the FHI with state-level sustainable development indicators appears limited.
2. **Analytical Gap:** Fiscal performance and sustainable development are often examined separately, with limited attention to their empirical alignment and divergence at the subnational level.
3. **Interpretation Gap:** A high fiscal-health score should not automatically be interpreted as evidence of superior overall development, yet this relationship has not been systematically mapped.

2.6 Conceptual Framework

The framework distinguishes five related but analytically separate dimensions:

1. **Fiscal Capacity:** Ability to mobilise resources through own-tax and own non-tax revenues.
2. **Intergovernmental Fiscal Resources:** Resources received through tax devolution, grants, and transfers.
3. **Fiscal Sustainability:** Ability to meet current and future fiscal obligations without unsustainable debt.
4. **Expenditure Composition and Quality:** Allocation of public expenditure (captured by the Quality of Expenditure sub-index through developmental expenditure ratio and capital outlay ratio).
5. **Development Outcomes:** Human development, poverty reduction, health, education, and living standards.

The central proposition is that stronger fiscal health can provide greater fiscal space for development-oriented expenditure, but fiscal resources do not automatically translate into superior development outcomes. Conversion depends on expenditure composition, institutional capacity, implementation efficiency, demographic conditions, and service delivery quality.

Note: The framework is conceptual and does not represent an estimated causal model.

3. DATA AND METHODOLOGY

3.1 Data Sources

This study relies on published secondary data from official government sources. The empirical analysis is restricted to the 18 major states covered by the FHI. The SDG India Index is used as the primary sustainable development indicator, whereas the MPI headcount ratio is used as a supplementary poverty-focused measure.

All empirical indicators used in the analysis are drawn from official Government of India publications. No secondary databases, media reports, estimated values, or reconstructed state-level observations are used.

3.1.1 Fiscal Health Data

The primary fiscal-health measure is the NITI Aayog Fiscal Health Index (FHI) 2025, published on 24 January 2025. The FHI assesses 18 major states using fiscal data for FY 2022–23

sourced from the Comptroller and Auditor General of India (CAG). The composite index comprises five sub-indices: Quality of Expenditure (QoE), Revenue Mobilisation (RM), Fiscal Prudence (FP), Debt Index (DI), and Debt Sustainability (DS).

FHI 2025 Quality of Expenditure Sub-Index Composition:

According to NITI Aayog's FHI 2025 methodology, the Quality of Expenditure sub-index is constructed from two indicators:

1. Total Developmental Expenditure / Total Expenditure
2. Total Capital Outlay / GSDP

Important: Committed expenditure is discussed separately in the state-level analysis but is not a component of the 2025 QoE score.

FHI 2025 Category Classification

Category	Threshold	States
Achiever	> 50	Odisha, Chhattisgarh, Goa, Jharkhand, Gujarat
Front Runner	40–50	Maharashtra, Uttar Pradesh, Telangana, Madhya Pradesh, Karnataka
Performer	25–40	Tamil Nadu, Rajasthan, Bihar, Haryana
Aspirational	≤ 25	Kerala, West Bengal, Andhra Pradesh, Punjab

Note: NITI Aayog assigns FHI categories using scores rounded to the nearest whole number. Thus, Maharashtra's underlying score of approximately 50.36 is rounded to 50 and classified as Front Runner, whereas Gujarat's approximately 50.55 rounds to 51 and is classified as Achiever.

3.1.2 Social Development Data

Development performance is measured using the SDG India Index 2023–24 (primary) and the National Multidimensional Poverty Index headcount ratio 2023 (supplementary). The SDG India Index covers 16 SDGs, 70 targets and 113 indicators. The supplementary poverty measure is the multidimensional poverty headcount ratio (the proportion of the population that

is multidimensionally poor), as reported in the National Multidimensional Poverty Index: A Progress Review 2023. Higher values indicate worse poverty outcomes.

3.2 Data Provenance and Temporal Correspondence

The following table documents the official sources and reference periods for all variables used in the analysis:

Variable	Official Source	Publication	Reference Period	Unit	Role
FHI overall score	NITI Aayog	Fiscal Health Index 2025	FY 2022–23	Index score	Main fiscal-health variable
Quality of Expenditure	NITI Aayog	Fiscal Health Index 2025	FY 2022–23	Index score	Sub-index
Revenue Mobilisation	NITI Aayog	Fiscal Health Index 2025	FY 2022–23	Index score	Sub-index
Fiscal Prudence	NITI Aayog	Fiscal Health Index 2025	FY 2022–23	Index score	Sub-index
Debt Index	NITI Aayog	Fiscal Health Index 2025	FY 2022–23	Index score	Sub-index
Debt Sustainability	NITI Aayog	Fiscal Health Index 2025	FY 2022–23	Index score	Sub-index
SDG score	NITI Aayog	SDG India Index 2023–24	2023–24	Index score	Development outcome
MPI headcount ratio	NITI Aayog/UNDP	National MPI 2023	NFHS-5, 2019–21	%	Poverty outcome

3.3 Data Harmonisation and Temporal Alignment

The analysis combines three official national datasets that are not perfectly contemporaneous. The FHI 2025 ranking is based on fiscal data for 2022–23, the SDG India Index 2023–24 reports development performance for 2023–24, and the National Multidimensional Poverty Index 2023 uses NFHS-5 data for 2019–21. Accordingly, the empirical exercise should be interpreted as a cross-sectional comparison of published official indicators rather than as a contemporaneous causal model.

Important: This study compares indicators from non-identical reference periods. The empirical exercise is best understood as a cross-sectional comparative analysis using indicators from proximate but non-identical reference periods. MPI is supplementary contextual evidence, not a contemporaneous dependent variable.

3.4 Analytical Approach

1. **Spearman's Rank Correlation** – Spearman's ρ examines the monotonic association between FHI and

sustainable development measures. Spearman's rank correlation coefficient (ρ) was selected because: (1) it assesses monotonic relationships without assuming linearity; (2) it is robust to outliers; and (3) it is appropriate for ordinal data and small samples. Confidence intervals were calculated using 10,000-replication bootstrap percentile method (Efron & Tibshirani, 1993). All tests are two-sided. Mid-ranks were used for tied observations.

2. **One-Way ANOVA** – Because of the small and unequal group sizes, the ANOVA is treated as an exploratory parametric comparison of group means, with Kruskal–Wallis and Welch's ANOVA used as robustness checks.
3. **Multiple Testing Correction** – Bonferroni adjustment is applied for sub-index correlations ($\alpha = 0.05/5 = 0.01$).
4. **Fiscal–Development Alignment Framework** – In this study, fiscal–development alignment refers to the relative correspondence between a state's position in the

FHI distribution and its position in the SDG distribution; it does not imply causal or institutional alignment.

Relative Fiscal–Development Rank Gap = FHI Percentile Rank – SDG Percentile Rank

Percentile Rank = $100 \times (N - r_{\text{mid}}) / (N - 1)$, with mid-ranks for ties used consistently throughout.

5. **Quadrant Mapping** – Medians are used because they provide a distribution-based split that is less sensitive to extreme values. Exploratory quadrant framework using median values (FHI = 41.5, SDG = 72.5). High = $\geq$ median; Low = $<$ median.
6. **Statistical Power** – Given $N = 18$, the analysis has limited power to detect moderate associations; consequently, confidence intervals and effect sizes are emphasised alongside p-values.

With $N = 18$ and $\alpha = 0.05$ (two-tailed), the study has approximately: (a) 50% power to detect a large correlation ($\rho = 0.60$); (b) 25% power to detect a moderate correlation ($\rho = 0.40$); and (c) 10% power to detect a small correlation ($\rho = 0.20$). Consequently, the wide confidence intervals indicate that both substantively meaningful negative and positive associations are compatible with the observed data. The analysis is therefore best understood as an exploratory descriptive comparison rather than a definitive test of the relationship.

4. EMPIRICAL FINDINGS

4.1 Fiscal Health Index 2025: Official State Rankings

Table 1: Fiscal Health Index 2025: State-wise Scores and Sub-Indices

Rank	State	FHI	Category	QoE	RM	FP	DI	DS
1	Odisha	67.8	Achiever	52.0	69.9	54.0	99.0	64.0
2	Chhattisgarh	55.2	Achiever	55.1	56.5	56.0	79.6	29.0
3	Goa	53.6	Achiever	45.5	87.1	59.4	51.0	25.2
4	Jharkhand	51.6	Achiever	47.3	45.7	62.4	66.9	35.7
5	Gujarat	50.5	Achiever	40.0	48.7	52.7	69.0	42.0
6	Maharashtra	50.3	Front Runner	37.1	59.1	41.8	76.4	36.8
7	Uttar Pradesh	45.9	Front Runner	45.8	34.6	44.7	59.9	44.5
8	Telangana	43.6	Front Runner	36.9	75.2	40.8	53.3	11.7
9	Madhya Pradesh	42.2	Front Runner	59.7	27.6	35.6	61.0	27.2
10	Karnataka	40.8	Front Runner	47.4	43.9	43.9	62.2	6.7
11	Tamil Nadu	29.2	Performer	32.0	41.2	25.8	36.0	11.1
12	Rajasthan	28.6	Performer	38.3	35.4	19.9	32.3	16.8
13	Bihar	27.8	Performer	56.1	5.3	11.5	47.2	18.8
14	Haryana	27.4	Performer	24.8	47.8	26.1	24.1	14.3
15	Kerala	25.4	Aspirational	4.2	54.2	34.0	23.1	11.3
16	West Bengal	21.8	Aspirational	32.3	12.4	25.4	18.3	20.6
17	Andhra Pradesh	20.9	Aspirational	31.4	22.1	13.3	37.8	0.0
18	Punjab	10.7	Aspirational	4.7	28.1	5.6	0.0	15.2

Source: NITI Aayog FHI 2025; Press Information Bureau, 2025.

Key Observations:

- Odisha leads with 67.8, substantially ahead of Chhattisgarh (55.2).
- FHI range is 57.1 points (67.8 to 10.7).
- Kerala's very low QoE score of 4.2 coincides with high committed expenditure (63.9% of revenue expenditure) and low capital expenditure (8.8% of total expenditure). Committed expenditure is discussed contextually but does not enter the QoE score calculation.
- Clear fiscal-performance tiers: five Achiever states occupy top five positions.

3.5 Statistical Reproducibility

All statistical calculations were performed directly from the state-level observations reported in the official source publications. Spearman correlations were calculated using rank-based procedures with average ranks for ties. Group differences were assessed using one-way ANOVA, Welch's heteroskedastic ANOVA, and the Kruskal–Walli's test. Multiple sub-index correlations were evaluated using Bonferroni-adjusted significance thresholds. Sensitivity was assessed using leave-one-state-out correlations.

3.6 Limitations

1. Small sample: $N = 18$ limits statistical power.
2. Cross-sectional design: Cannot establish causality.
3. Temporal mismatch: FHI (FY 2022–23), SDG (2023–24), MPI (NFHS 2019–21).
4. Composite indices: FHI and SDG are constructed; component relationships may reflect index construction.
5. Exploratory quadrant classification: Median-based quadrants are author-constructed.
6. Omitted variables: Income, demography, urbanisation, natural resources, human capital, and institutional capacity may influence both outcomes.

4.2 Social Development Indicators

Table 2: SDG India Index 2023–24: 18-State Analytical Sample

Rank	State	SDG Score	SDG Category
1	Kerala	79	Front Runner
2	Tamil Nadu	78	Front Runner
3	Goa	77	Front Runner
4	Punjab	76	Front Runner
5	Karnataka	75	Front Runner
6	Gujarat	74	Front Runner
6	Andhra Pradesh	74	Front Runner
6	Telangana	74	Front Runner
9	Maharashtra	73	Front Runner
10	Haryana	72	Front Runner
11	West Bengal	70	Front Runner
12	Rajasthan	67	Front Runner
12	Madhya Pradesh	67	Front Runner
12	Uttar Pradesh	67	Front Runner
12	Chhattisgarh	67	Front Runner
16	Odisha	66	Front Runner
17	Jharkhand	62	Performer
18	Bihar	57	Performer

Source: NITI Aayog SDG India Index 2023–24; Press Information Bureau, 2024. SDG categories follow NITI Aayog's SDG India Index classification and are independent of the FHI categories.

Key Contrast: Kerala is joint-first nationally on the SDG score (along with Uttarakhand) and first among the 18 states in the analytical sample but 15th in FHI; Odisha ranks 1st in FHI but 16th in SDG.

4.3 Spearman's Rank Correlation Analysis

Table 3: Spearman Rank Correlations (n = 18, two-sided)

Variable Pair	Spearman's ρ	95% CI	p-value	Interpretation
FHI 2025 – SDG	–0.319	[–0.72, 0.18]	0.197	Negative; not statistically significant
FHI 2025 – MPI Headcount Ratio	+0.340	[–0.16, 0.71]	0.168	Positive; not statistically significant

Note: For MPI headcount ratio, higher values represent worse outcomes. CIs are bootstrap-based.

Interpretation: The estimate does not provide sufficient evidence of a statistically significant monotonic association in this sample. The wide confidence interval reflects the small sample; the true correlation could be substantially negative or positive. The sample exhibits a positive but statistically non-significant FHI–MPI headcount ratio rank association.

Hypothesis Decision: H_1 (fiscal-health rankings are significantly associated with sustainable-development rankings) is not supported by the empirical evidence.

4.4 ANOVA: Testing Mean Differences across FHI Categories

Table 4: Mean SDG Scores by FHI Category

FHI Category	N	Mean SDG	SD
Achiever	5	69.20	6.14
Front Runner	5	71.20	3.90
Performer	4	68.50	8.89
Aspirational	4	74.75	3.77

ANOVA Results: $F(3, 14) = 0.923$, $p = 0.455$, $\eta^2 \approx 0.165$.

Robustness Checks:

- Welch's ANOVA: $p \approx 0.401$ (not significant)
- Kruskal–Wallis: $H = 2.85$, $p = 0.415$ (not significant)
- Levene's test (10% trimmed mean): $F = 1.546$, $p = 0.247$ (homogeneity not rejected)

Finding: Mean SDG scores do not differ significantly across the four FHI categories ($F(3, 14) = 0.923$, $p = 0.455$; $\eta^2 \approx 0.165$,

indicating a small effect size). The robustness checks (Welch's ANOVA, Kruskal–Wallis, and Levene's test) are consistent with this finding. However, the small group sizes ($n = 4–5$) limit statistical power; the absence of significant differences should not be interpreted as evidence of equivalence.

Hypothesis Decision: H_2 (mean SDG scores differ significantly across the four FHI performance categories) is not supported by the empirical evidence.

4.5 Sub-Index Analysis (Addressing RQ₁)

Table 5: Spearman Correlations between FHI Sub-Indices and SDG Scores (n = 18)

FHI Sub-Index	Spearman's ρ	95% CI	p-value	Interpretation
Quality of Expenditure	-0.669	[-0.87, -0.29]	0.002	Largest absolute rank correlation
Revenue Mobilisation	+0.256	[-0.24, 0.65]	0.306	Positive; not significant
Fiscal Prudence	-0.151	[-0.59, 0.34]	0.550	Weak negative; not significant
Debt Index	-0.403	[-0.74, 0.08]	0.097	Moderate negative; not significant at 5%
Debt Sustainability	-0.579	[-0.83, -0.16]	0.012	Moderate to strong negative; significant at unadjusted 5%

Bonferroni Adjustment ($\alpha = 0.01$):

- Quality of Expenditure ($p = 0.002$) survives the Bonferroni adjustment for the five sub-index correlations.
- Debt Sustainability ($p = 0.012$) does not survive adjustment.

4.5.1 Sensitivity Analysis: Quality of Expenditure

Because the QoE–SDG correlation (-0.669) is the strongest finding and may be influenced by individual states, a leave-one-state-out sensitivity analysis was conducted for all 18 states:

Table 6: Leave-One-Out Sensitivity Analysis – QoE–SDG Correlation

State Removed	ρ (QoE–SDG)	Change from Full Sample
None	-0.669	—
Andhra Pradesh	-0.632	+0.037
Bihar	-0.638	+0.031
Chhattisgarh	-0.724	-0.055
Goa	-0.724	-0.055
Gujarat	-0.700	-0.031
Haryana	-0.706	-0.037
Jharkhand	-0.659	+0.010
Karnataka	-0.753	-0.084
Kerala	-0.607	+0.062
Madhya Pradesh	-0.648	+0.021
Maharashtra	-0.681	-0.012
Odisha	-0.684	-0.015
Punjab	-0.637	+0.032
Rajasthan	-0.685	-0.016
Tamil Nadu	-0.644	+0.025
Telangana	-0.681	-0.012
Uttar Pradesh	-0.645	+0.024
West Bengal	-0.679	-0.010

Source: Author's calculations based on NITI Aayog FHI 2025 and SDG India Index 2023–24.

Result: The correlation remains negative for all leave-one-out samples (range: -0.753 to -0.607). Removing Karnataka yields the strongest negative correlation (-0.753); removing Kerala yields the weakest (-0.607). The leave-one-out sensitivity analysis confirms that the negative QoE–SDG association is robust to the exclusion of any single state, with the correlation remaining negative across all 18 exclusions. Because the sample contains only 18 states, leave-one-out stability should be interpreted as sensitivity evidence rather than as evidence of generalizability.

Exploratory Finding: Quality of Expenditure exhibits the largest absolute rank correlation with SDG scores, surviving Bonferroni adjustment. The Quality of Expenditure sub-index is an index of fiscal expenditure composition, not an outcome-based measure of public-service effectiveness. Because the QoE index is itself a constructed measure based on

developmental-expenditure and capital-outlay ratios, its negative association with the SDG index may reflect differences in expenditure composition, structural characteristics of states, index construction, or omitted variables. The result should therefore be interpreted as an empirical association requiring further investigation, not as evidence of a detrimental effect of expenditure quality.

4.6 Exploratory Fiscal–Development Alignment Framework

Relative Fiscal–Development Rank Gap = FHI Percentile Rank – SDG Percentile Rank

Ranking Convention: All ranks use mid-ranks for ties. For three states tied at SDG 74 (positions 6, 7, 8), the mid-rank is 7. For four states tied at SDG 67 (positions 12, 13, 14, 15), the mid-rank is 13.5.

Table 7: Relative Fiscal–Development Rank Gap Analysis (using mid-ranks for ties)

State	FHI	SDG	FHI Rank	SDG Rank	FHI %ile	SDG %ile	Gap
Odisha	67.8	66	1	16	100.0	11.8	+88.2
Chhattisgarh	55.2	67	2	13.5	94.1	26.5	+67.6
Goa	53.6	77	3	3	88.2	88.2	0.0
Jharkhand	51.6	62	4	17	82.4	5.9	+76.5
Gujarat	50.5	74	5	7	76.5	64.7	+11.8
Maharashtra	50.3	73	6	9	70.6	52.9	+17.6
Uttar Pradesh	45.9	67	7	13.5	64.7	26.5	+38.2
Telangana	43.6	74	8	7	58.8	64.7	−5.9
Madhya Pradesh	42.2	67	9	13.5	52.9	26.5	+26.5
Karnataka	40.8	75	10	5	47.1	76.5	−29.4
Tamil Nadu	29.2	78	11	2	41.2	94.1	−52.9
Rajasthan	28.6	67	12	13.5	35.3	26.5	+8.8
Bihar	27.8	57	13	18	29.4	0.0	+29.4
Haryana	27.4	72	14	10	23.5	47.1	−23.5
Kerala	25.4	79	15	1	17.6	100.0	−82.4
West Bengal	21.8	70	16	11	11.8	41.2	−29.4
Andhra Pradesh	20.9	74	17	7	5.9	64.7	−58.8
Punjab	10.7	76	18	4	0.0	82.4	−82.4

Source: Author's calculations based on NITI Aayog FHI 2025 and SDG India Index 2023–24.

Largest Positive Gaps (FHI > SDG): Odisha (+88.2), Jharkhand (+76.5), Chhattisgarh (+67.6).

Largest Negative Gaps (SDG > FHI): Kerala (−82.4), Punjab (−82.4), Andhra Pradesh (−58.8), Tamil Nadu (−52.9).

Note: The measure is ordinal and does not represent a cardinal difference in fiscal or development performance.

4.7 Exploratory Median-Based Fiscal–Development Quadrant Mapping

Medians: FHI = 41.5, SDG = 72.5. High = $\geq$ median; Low = $<$ median.

Quadrant	Label	States
I	Development Strength with Lower Fiscal Health (Low FHI, High SDG)	Kerala, Tamil Nadu, Punjab, Karnataka, Andhra Pradesh
II	High Fiscal Health and High SDG Performance (High FHI, High SDG)	Goa, Gujarat, Maharashtra, Telangana
III	Fiscal–Development Divergence (High FHI, Low SDG)	Odisha, Chhattisgarh, Jharkhand, Uttar Pradesh, Madhya Pradesh
IV	Relative Weakness on Both Dimensions (Low FHI, Low SDG)	Rajasthan, Bihar, Haryana, West Bengal

Note: The quadrants are an author-constructed descriptive typology. The quadrants are descriptive categories based on median splits. They should not be interpreted as statistically distinct clusters; a state near the median could potentially fall into either adjacent quadrant with small data changes.

4.8 Temporal Robustness Check: FHI 2025–2026 Persistence

Table 8: Fiscal Health Index 2026: Official Scores and Rankings (All 18 States)

Rank	State	FHI 2026 score	Change from 2025
1	Odisha	73.1	+5.3
2	Goa	54.7	+1.1
3	Jharkhand	50.5	−1.1
4	Gujarat	49.9	−0.6
5	Maharashtra	45.0	−5.3
6	Chhattisgarh	44.3	−10.9
7	Telangana	44.3	+0.7
8	Uttar Pradesh	41.9	−4.0
9	Karnataka	41.7	+0.9
10	Madhya Pradesh	37.8	−4.4
11	Haryana	34.5	+7.1
12	Bihar	30.9	+3.1
13	Tamil Nadu	29.8	+0.6
14	Rajasthan	27.6	−1.0
15	Kerala	24.8	−0.6
16	West Bengal	23.8	+2.0
17	Andhra Pradesh	23.1	+2.2
18	Punjab	12.4	+1.7

Source: NITI Aayog, Fiscal Health Index 2026; Press Information Bureau, 11 March 2026.

Temporal Robustness Check: As a temporal robustness check, the FHI 2025 scores were compared with the corresponding FHI 2026 scores for the 18 major states. Using Spearman's rank correlation with average ranks for the tied 44.3 scores of Chhattisgarh and Telangana, the correlation is approximately $\rho = 0.951$ ($p < 0.001$). This indicates very strong persistence in the relative fiscal-health ordering across the two editions.

This very high rank correlation indicates that the fiscal ranking structure is highly persistent across the two editions. The persistence of several states near the top and bottom of the FHI distribution provides a useful temporal check on fiscal rankings, although it does not constitute a test of the persistence of fiscal–development alignment.

Note: The FHI 2026 report also presents ‘recalculated/comparative 2022–23 values alongside the 2023–24 results. Because these comparative values differ slightly from the originally published FHI 2025 scores, the FHI 2025–2026 comparison is interpreted primarily as a rank-persistence check.

5. DISCUSSION

5.1 Main Finding: Fiscal Health and Development are Distinct Dimensions

The empirical evidence reveals considerable variation between fiscal-health and sustainable-development performance. The aggregate correlation is negative but not statistically significant ($\rho = -0.319$, $p = 0.197$). The evidence should be described as descriptive fiscal-development divergence rather than a statistically established negative relationship.

The central conclusion is that fiscal health and sustainable development performance are empirically distinct dimensions of state performance. Fiscal health is an important but conceptually distinct dimension of state performance; it is neither synonymous with nor a substitute for sustainable development performance.

5.2 What the Evidence Supports and Does Not Establish

What the evidence supports:

1. FHI and SDG rankings are not strongly positively aligned.
2. The full-sample Spearman correlation is negative but statistically insignificant.
3. Mean SDG scores do not differ significantly across FHI categories.
4. QoE has a statistically significant negative rank association with SDG.
5. The QoE relationship survives multiple-testing adjustment.
6. The QoE association remains negative under leave-one-out analysis.
7. FHI rankings are very strongly persistent between 2025 and 2026 ($\rho = 0.951$).

What the evidence does NOT establish:

1. Fiscal health causes development.
2. Fiscal health harms development.
3. Capital expenditure reduces SDG performance.
4. Revenue mobilisation causes better/worse SDG outcomes.

5. Historical investment explains Kerala/Tamil Nadu's performance.
6. Natural-resource revenues cause high FHI.
7. Demographic transition causes the observed patterns.

5.3 Interpretive Pathways (Hypothesis-Generating)

Expenditure composition: The negative association between Quality of Expenditure and SDG scores ($\rho = -0.669$, $p = 0.002$) is noteworthy. The sub-index captures expenditure composition (developmental expenditure ratio and capital outlay ratio), not expenditure effectiveness. The negative association may reflect differences between the expenditure composition captured by the FHI and the outcome orientation of the SDG Index. For example, capital-intensive expenditure may generate benefits over longer horizons. Because the QoE index is itself a constructed measure based on developmental-expenditure and capital-outlay ratios, its negative association with the SDG index may reflect differences in expenditure composition, structural characteristics of states, index construction, or omitted variables. The result should therefore be interpreted as an empirical association requiring further investigation, not as evidence of a detrimental effect of expenditure quality.

Possible resource-revenue mechanism: The concentration of high-FHI states among those with substantial non-tax revenue (Odisha, Jharkhand, Goa, Chhattisgarh) suggests a potentially important resource-revenue mechanism that merits investigation in future panel-based research. This interpretation is speculative and requires testing with longitudinal data.

Historical investment interpretation: Kerala and Tamil Nadu illustrate that strong sustainable development outcomes can coexist with relatively weaker fiscal-health positions. One possible explanation is that historical investments in health, education, and social infrastructure may contribute to persistent development outcomes not captured by a single-year fiscal-health measure. This requires longitudinal investigation.

Demographic transition: States at different stages of demographic transition face different fiscal challenges. This should be treated as a possible explanation and direction for future research.

5.4 Complementarity: The Case of Goa

Goa provides an example of strong performance on both dimensions, ranking third on both measures (FHI 2025: 53.6, SDG: 77). It demonstrates that strong fiscal performance and strong sustainable development performance can coexist.

5.5 What the Indices Measure—and What They Do Not Measure

FHI measures fiscal health. It does not directly measure health outcomes, education outcomes, poverty, nutrition, gender equality, or environmental performance.

SDG Index measures development performance. It does not directly measure fiscal sustainability, debt sustainability, fiscal deficit, or revenue mobilisation.

Therefore, a weak correlation is not necessarily surprising. Thus, the absence of a strong correlation between the FHI and SDG Index is not a failure of either measure but reflects their distinct conceptual domains. This is the intellectual heart of the paper.

5.6 Interpreting the FHI as a Fiscal Rather than Development Index

The FHI should not be evaluated as an alternative to a sustainable development index. A high FHI score should not be interpreted as evidence that a state necessarily has better health, education, or poverty outcomes. Fiscal health is an important but conceptually distinct dimension of state performance; it is neither synonymous with nor a substitute for sustainable development performance.

Diagnostic questions for different configurations:

Configuration	Illustrative States	Diagnostic Question
Fiscal–Development Divergence	Odisha, Chhattisgarh, Jharkhand	Are fiscal resources translating into broad-based development gains?
Development Strength with Lower Fiscal Health	Kerala, Tamil Nadu, Punjab, Karnataka	How can existing development achievements be preserved while strengthening fiscal sustainability?
High Fiscal Health and High SDG Performance	Goa	Which institutional and expenditure practices may support simultaneous fiscal and development performance?
Relative Weakness on Both Dimensions	Bihar, West Bengal, Rajasthan, Haryana	Which structural, fiscal and service-delivery constraints jointly limit performance?

Additional policy implications:

1. **Dual monitoring:** States should not evaluate fiscal performance using FHI alone. A Fiscal Health Dashboard + Development Outcome Dashboard with FHI, SDG score, multidimensional poverty, health, education, capital expenditure, and debt sustainability is recommended.
2. **Diagnose fiscal-development divergence:** For high-FHI/low-SDG states, investigate whether fiscal strength is translating into effective service delivery and human-development outcomes.
3. **Protect fiscal sustainability in high-development/low-FHI states:** For Kerala/Tamil Nadu-type cases, preserve development achievements while improving debt sustainability and fiscal space. As noted in the FHI 2026 report, states like Punjab, Kerala, and West Bengal face elevated debt and interest commitments, with interest payments exceeding 15–20% of revenue receipts, leaving limited room for developmental spending.
4. **Expenditure composition deserves further evaluation:** Because QoE has the strongest observed association, governments should examine not merely how much they spend but what expenditure is financed, when benefits materialise, and whether expenditure produces measurable outcomes. Committed expenditures—salaries, pensions, and interest payments—consume a significant portion of state revenues, constraining fiscal flexibility and limiting space for capital investment.

7. LIMITATIONS

First, the sample contains only 18 major states, limiting statistical power.

Second, the indicators refer to different underlying periods: FHI 2025 uses FY 2022–23 data, the SDG India Index 2023–24 uses 2023–24 data, and the National MPI 2023 uses NFHS-5 data from 2019–21.

Third, the analysis is cross-sectional and cannot establish causality.

6. POLICY IMPLICATIONS

Evidence-based implication: Fiscal monitoring should be complemented by development-outcome monitoring. The findings support the potential value of complementing fiscal-health monitoring with a parallel dashboard of social and development outcomes.

Fourth, FHI and SDG are composite indices, so correlations between their components may partly reflect index construction.

Fifth, the analysis does not control for structural characteristics such as income, demographic composition, urbanisation, or historical human-capital accumulation.

Sixth, the analysis does not account for sub-state variation; district-level patterns may differ from state averages.

These limitations do not invalidate the descriptive evidence but constrain the extent to which the findings can be interpreted as structural or causal relationships.

8. CONCLUSION

8.1 Summary of Findings

1. **Fiscal health and sustainable development performance are not systematically aligned.** Odisha ranks 1st in FHI 2025 (67.8) but 16th in SDG (66). Kerala is joint-first nationally on the SDG score (along with Uttarakhand) and first among the 18 states in the analytical sample but 15th in FHI 2025 (25.4).
2. **The aggregate statistical relationship is negative but not statistically significant.** Spearman's $\rho = -0.319$ (95% CI: [-0.72, 0.18], $p = 0.197$). H_1 is not supported.
3. **FHI categories do not produce statistically significant differences in SDG performance.** ANOVA: $F(3, 14) = 0.923$, $p = 0.455$. H_2 is not supported.
4. **Sub-index relationships are heterogeneous.** Quality of Expenditure shows the largest absolute rank correlation with SDG scores ($\rho = -0.669$, $p = 0.002$), surviving Bonferroni adjustment. The leave-one-out sensitivity analysis indicates that the negative rank association is not materially dependent on the exclusion of any single state.
5. **Substantial fiscal-development rank gaps exist.** Odisha, Jharkhand, and Chhattisgarh have large positive gaps; Kerala, Punjab, Andhra Pradesh, and Tamil Nadu have large negative gaps.
6. **Strong performance on both dimensions is possible.** Goa ranks third on both measures. The principal conclusion is that fiscal health and sustainable development performance are complementary but distinct dimensions of state performance. The evidence

does not establish a general positive or negative association between the two dimensions in the 18-state cross-section.

8.2 Concluding Remarks

The NITI Aayog Fiscal Health Index represents an important advance in systematic benchmarking of state-level fiscal performance. The present analysis shows that fiscal health and sustainable development performance cannot be assumed to move together. The statistical evidence does not support a general claim of a negative fiscal-development relationship; the aggregate correlation is negative but not statistically significant.

The most defensible conclusion is that fiscal health and sustainable development performance are empirically distinct dimensions of state performance, with substantial variation in their alignment across Indian states. The negative aggregate coefficient should not be interpreted as evidence of a negative population-level relationship because its confidence interval includes economically meaningful positive and negative values.

The Fiscal-Development Alignment Framework provides a descriptive tool for identifying relative configurations. Its principal value lies in demonstrating that fiscal sustainability and sustainable development should be monitored together while retaining their conceptual distinction. As additional editions of the FHI become available, panel analyses may reveal whether fiscal-development associations strengthen or weaken over time.

REFERENCES

1. NITI Aayog. (2025). *Fiscal Health Index: Annual Report for the Financial Year 2022–23*. Government of India, New Delhi.
2. NITI Aayog. (2026). *Fiscal Health Index: Annual Report for the Financial Year 2023–24*. Government of India, New Delhi. Available at: <https://niti.gov.in/sites/default/files/2026-03/Fiscal-Health-Index-2026.pdf>
3. NITI Aayog. (2024). *SDG India Index 2023–24*. Government of India, New Delhi.
4. NITI Aayog & UNDP. (2023). *National Multidimensional Poverty Index: A Progress Review 2023*. Government of India, New Delhi.
5. Reserve Bank of India. (2024). *State Finances: A Study of Budgets of 2024–25*. Mumbai.
6. Press Information Bureau. (2025, January 24). NITI Aayog launches the "Fiscal Health Index 2025" in New Delhi.
7. Press Information Bureau. (2025, April 2). *Fiscal Health Index 2025: Key findings and state-wise scores*.
8. Press Information Bureau. (2024, July 12). *SDG India Index 2023–24: India's composite score improves to 71*.
9. Press Information Bureau. (2026, March 11). NITI Aayog launches second annual edition of "Fiscal Health Index". Available at: <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2238302®=3&lang=1>
10. Press Information Bureau. (2023, July 17). *13.5 crore Indians escape Multidimensional Poverty in 5 years*.
11. Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics*, 95(7–8), 476–487.
12. Anand, S., & Ravallion, M. (1993). Human development in poor countries. *Journal of Economic Perspectives*, 7(1), 133–150.
13. Blanchard, O. J. (1990). *Suggestions for a new set of fiscal indicators*. OECD Economics Department Working Papers, No. 79.
14. Buiter, W. H. (1985). A guide to public sector debt and deficits. *Economic Policy*, 1(1), 13–61.
15. Devarajan, S., Swaroop, V., & Zou, H.-F. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, 37(2), 313–344.
16. Efron, B., & Tibshirani, R. J. (1993). *An introduction to the bootstrap*. Chapman & Hall.
17. Ghosh, A. R., Kim, J. I., Mendoza, E. G., Ostry, J. D., & Qureshi, M. S. (2013). Fiscal fatigue, fiscal space and debt sustainability in advanced economies. *The Economic Journal*, 123(566), F4–F30.
18. Gupta, S., Verhoeven, M., & Tiongson, E. R. (2002). The effectiveness of government spending on education and health care. *European Journal of Political Economy*, 18(4), 717–737.
19. Musgrave, R. A. (1959). *The Theory of Public Finance*. McGraw-Hill.
20. Oates, W. E. (1972). *Fiscal Federalism*. Harcourt Brace Jovanovich.
21. Rao, M. G. (2002). State finances in India: Issues and challenges. *Economic and Political Weekly*, 37(31), 3261–3271.
22. Rao, M. G., & Vaillancourt, F. (2020). The Goods and Services Tax and fiscal federalism in India: An assessment. *Publius: The Journal of Federalism*, 50(3), 492–517.
23. Rodden, J. (2002). The dilemma of fiscal federalism. *American Journal of Political Science*, 46(3), 670–687.
24. Weingast, B. R. (2009). Second generation fiscal federalism. *Journal of Urban Economics*, 65(3), 279–293.