

Does fiscal deficit lead to economic growth? An empirical evidence from Indian States

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Abstract

The article analyses the effect of fiscal deficit on economic growth using balanced panel data from 24 Indian states from 2001 to 2019. The study explores the presence of cross-sectional heterogeneity and common factor dependence among the clubs of Indian states with similar growth paths. The CCE result reveals heterogeneity and common factor dependence among the groups, despite having similar growth paths. This underscores the need for tailored fiscal policies that consider the unique economic characteristics of the states to achieve a balanced economic growth. We explore the implications of the uniform fiscal rules and advocate for a paradigm shift towards a framework that supports state-specific fiscal autonomy and sustainable growth.

Keywords: *Fiscal Deficit, Economic Growth, CCEMG, Club Convergence*

1. Background

Fiscal performance is a crucial aspect of a country's economic growth, influenced by the utilization of public finance instruments such as tax policy, expenditure policy, and overall budgetary policy (Zee, 1996). For developing countries like India, fiscal policy serves as both an indicator and determinant of economic growth, where tax and expenditure measures aimed at promoting development and macroeconomic stability can often lead to increased public debt. The increase in public debt indeed shows a drift from the neoclassicals to Keynesian theories with an increased role for the government and as a developing nation, the increased role seems necessary. However, higher fiscal deficits can affect savings as well as investment, either directly or indirectly by inflation or interest rates, which could eventually dampen the potential macroeconomic stability of the nation. With an increasing trend and dependency on fiscal deficit, India has forced the nation to implement rule-based counteractive measures to reduce the fiscal deficit in lieu of international standards, and eventually, even state governments were obliged to follow them. Understanding the implications of these fiscal deficits requires examining the distinct perspectives offered by the Neoclassical, Keynesian, and Ricardian schools of thought. The Neoclassical view, highlighted by (Bernheim, 1989), considers individuals as forward-looking, planning their consumption over their lifetimes. This framework emphasizes the long-term consequences of permanent deficits, suggesting that if private savings do not fully offset the decline in government savings, economic growth may be negatively affected. This is particularly evident in closed economic systems, where increased consumption could lead to reduced overall savings.

In contrast, the Keynesian perspective advocates that deficit-financed government spending can boost economic output, especially under conditions of underemployment and idle resources. This approach underscores that government deficits can enhance private investment and stimulate economic growth through a multiplier effect, potentially leading to a crowding-in effect rather than crowding out private investment. Additionally, the Ricardian Equivalence Theorem (RET) (Barro, 1974) posits that the timing of taxation does not significantly impact overall savings and investment levels. According to RET, reductions in government savings due to deficits are balanced by increased private savings, as individuals anticipate future taxation to cover current government expenditures. In India, where persistent fiscal deficits have been predominantly financed through borrowing from the

Reserve Bank of India and public borrowing, this has resulted in a growing national debt burden. But often it is the composition of the government expenditure that drives both these theories. Studies have tried to understand the relationship of fiscal deficit and economic growth through various methodologies in different contexts but often fail to capture the heterogeneity in case of the economic potential and development strategy. These rule based disciplines such as the FRBM act introduced in 2003 was majorly to control the revenue deficit and foster fiscal discipline mainly for the central government, which was eventually also taken up by the state governments. It is to address fiscal indiscipline, higher debt, spillover into monetary policy and higher inflation. While the FRBM aims at a broad based fiscal intervention, the approach has to be looked into, particularly in the context of India's federal structure and the diverse capabilities of its states.

The present study addresses the gap in understanding how fiscal deficit impacts economic growth by considering the diverse characteristics of Indian states and critically evaluating the current fiscal framework in the context of cross-sectional heterogeneity and common factor dependence among groups of states with similar growth trajectories.

2. Literature Review

Fiscal deficit remains a central issue in the economic policy discourse, especially in the context of developing economies like India. The relationship between fiscal deficits and economic growth has long intrigued economists, leading to a diverse range of studies with varying conclusions. This literature review synthesizes findings from research on the impact of fiscal deficits on economic growth in India, its states, and other countries. Chakraborty (2017) studied how strict numerical ceilings on fiscal deficits might curb capital investment, thus constraining economic growth in India. Interestingly, many nations diverge from such numerical targets, opting instead for more flexible fiscal frameworks. This divergence not only prompts a critical reevaluation of fiscal norms but also underscores the potential of flexible policies in fostering balanced economic growth. On the contrary Behera and Mallick (2022), in their examination of 14 prominent states in India, observed that fiscal deficits have adverse effects on economic growth, tax revenues, and inflation. Nevertheless, their research did not account for potential variations in resource allocation and distribution among different states, which may have influenced these outcomes. Furthermore the study by Ali (2022) emphasized the need for fiscal discipline in maintaining economic growth and thereby securing investor confidence, good global rating. Another study by M R & K (2016)

highlighted that while fiscal deficits typically harm economic growth, strategically using borrowed funds for capital formation instead of current expenditures can be more beneficial in managing fiscal deficits. By analysing the data from 1991 to 2014 (Bhoir and Dayre, 2015) stated that there is no significant relationship between fiscal deficits and economic growth in India, it further asserts that the government have shift more focus towards improving human development indicators, such as health, education, and infrastructure, which could boost productivity and drive long-term economic growth. These perspectives further amplify the developmental road map of fiscal deficit in maintaining higher levels of economic growth. When we are moving beyond India, Onwioduokit and Bassey (2014) studied the fiscal deficit in Gambia, presenting evidence that aligns with the Keynesian perspective on fiscal deficits as drivers of economic growth. Through empirical analysis, they showed that fiscal deficits have a positive and significant effect on real economic growth, emphasizing the critical threshold required to sustain this growth while the effect was negative in Sierra Leone (Korsu, 2006), the long-term analysis revealed a significant negative relationship between budget deficits and GDP, money supply, and the exchange rate, while the impact on interest rates and inflation was positive but not significant. This discovery underscores the potential of fiscal deficits as a tool for fostering economic expansion in developing countries, provided they are managed within sustainable boundaries. In similar time a study conducted by (Maweje, 2014) in Uganda reported that no direct causality between GDP and budget deficits. However, they found that budget deficits significantly contributed to the expansion of current account deficits and elevated interest rates. By analyzing the effects of budget deficits on macroeconomic variables in Sierra Leone (Korsu, 2006) revealed a significant negative relationship between budget deficits and GDP, money supply, and the exchange rate, while the impact on interest rates and inflation was positive but not significant. For a cross country comparison (Adam and Bevan 2003) conducted research using panel data from 45 developing nations, identifying a threshold effect. They observed that maintaining the fiscal deficit at approximately 1.5% could enhance economic growth. Going beyond this threshold, additional fiscal contraction could negatively impact economic growth and is not recommended. Research centered on ASEAN countries by (Wee-Yeap Lau, 2019) investigated the influence of fiscal deficits on economic growth. The study revealed that before the Global Financial Crisis, fiscal deficits showed a negative correlation with economic growth. However, in the aftermath of the crisis, there emerged a positive relationship between the two variables, suggesting that fiscal deficits contributed to stimulating economic growth during this period. Navaratnam and Mayandy (2016) explored

the effects of fiscal deficits on economic growth in five South Asian countries: Bangladesh, India, Nepal, Pakistan, and Sri Lanka. Using cointegration and Granger causality tests, their analysis indicated that fiscal deficits negatively impacted growth in Bangladesh, India, Pakistan, and Sri Lanka, while Nepal experienced a positive impact. Another dimension of fiscal deficit and growth put forward by (Chakraborty,2007) investigated the interaction between public and private investment in India concluded that public and private investments are complementary, particularly through public infrastructure investment stimulating private corporate investment.

3. Data and Methodology

The study utilized panel data from 24 Indian states from 2001 to 2019 from the EPWRF and RBI's Handbook of Statistics on Indian States. Due to the unavailability of data , Telengana, Mizoram , Arunachal Pradesh and Sikkim were excluded from the analysis. Studies have analyzed the impact of fiscal deficit on economic growth using variables such as GSDP per capita (Sachs et al., 2002; Nayyar, 2008), capital formation (Sharma & Mittal, 2019; Bal et al., 2016), inflation (Mallik & Chowdhury, 2001; Behera & Mishra, 2017), and tax revenue (Behera & Mallick, 2022; Neog & Gaur, 2020).

The relationship between economic growth and fiscal deficit is investigated by two different methodologies. Firstly , the panel of states has grouped using club convergence based on percapita income growth rate. The club convergence allows the identification of groups with similar convergence characteristics by accounting heterogenous technology and non-linear changes overtime (Phillips & Sul, 2007). Furthermore, the study employs advanced panel dynamic regression models such as Mean Group(MG), Demean Group(DMG), and Common Correlated Effects Mean Group (CCEMG) to capture the complex dynamics within a heterogenous model.

The basic model for estimation is (1):

$$G_{it} = \varphi_{it} + \alpha TR_{it} + \beta INV_{it} + \gamma GFD_{it} + \delta INF_{it} + \theta(INT_1)_{it} + \phi(INT_2)_{it} + \varepsilon_{it} \dots\dots (1)$$

Where, G_{it} is Per capita income growth rate, TR_{it} is Tax Revenue, INV_{it} is Investment, GFD_{it} is Gross fiscal deficit, INF_{it} is inflation. Interactive terms INT_1 and INT_2 represents $GFD*INF$ and $INV*TR$ respectively.

When examining the impact of fiscal deficit on economic growth, the influence of shared statistical patterns on creating interdependence among the states are often ignored. Because the traditional panel data analysis like Pooled OLS and Fixed effect assumes homogenous slope coefficient across panel and uniform effect of cross-sectional dependence. In contrast, the MG estimator allows for parameter heterogeneity (Shin, Y., & Pesaran, 1998), while CCMG estimator incorporate cross sectional averages to account for unobservable common factors, thereby providing a more flexible and accurate model for analysing panel data.

The basic panel model for MG estimation is (2):

$$G_{it} = \varphi_i + \alpha_i x_{it} + \varepsilon_{it} \dots\dots\dots(2)$$

Where, G_{it} is the dependent variable for unit I and time t, x_{it} is a $k*1$ vector of independent variables specific to i th cross-sectional units in t time. unit specific intercept and slops respectively, is the error term which capture the heterogeneity. The MG model estimate separately for each cross sectional to permit full parameter heterogeneity. While the DMG addresses the issue of cross-sectional dependence by demeaning data across the cross-sectional units.

The DMG model is (3):

$$G_{it} = \varphi_i + \alpha_i x_{it} + \varepsilon_{it} \dots\dots\dots(3)$$

With demeaning procedure:

$$\bar{G}_{it} = G_{it} - \bar{G}_t$$

$$\bar{x}_{it} = x_{it} - \bar{x}_t$$

Where, \bar{G}_t and \bar{x}_t are the cross-sectional average at time t.

However, the model partially addresses the issue of cross-sectional dependence. But the CCEMG uses cross-sectional averages of the dependent and independent variables as proxies for the common factors in estimation (Chudik & Hashem Pesaran, 2014).

The CCEMG model is (4):

$$G_{it} = \varphi_i + \alpha_i x_{it} + \lambda_i \bar{G}_t + \delta_i \bar{x}_t + \varepsilon_{it} \dots\dots\dots(4)$$

Where, λ_i and δ_i are the common factor estimators.

4. Results

Club Convergence

The club convergence model helps to identify the variation in the per capita income growth rates and the existing economic disparities among Indian states. So, initially, the study examined the convergence of per capita income growth rates across various Indian states to categorize them into uniform groups to reduce the effect of heterogeneity in the panels .

Table :1

Club Convergence results

Clubs	States	beta	Spread of Convergence
Club1	Karnataka, Andhra Pradesh, Madhya Pradesh, Assam, Manipur	1.022*** (0.305)	0.511
Club2	Odisha, Tripura, Tamil Nadu, Gujarat	0.437 *** (0.387)	0.2185
Club3	Uttar Pradesh, Rajasthan, West Bengal, Kerala, Haryana, Chhattisgarh, Bihar, Goa	0.624*** (0.157)	0.312
Club4	Jharkhand, Maharashtra, Punjab, Meghalaya, Himachal Pradesh, Nagaland, Uttarakhand	0.79*** (0.087)	0.395

Source: authors' calculation

***** indicate 5% level of significance*

The convergence of Indian states (Table 1) based on per capita income growth rates revealed four clubs with similar growth paths. All the clubs are positively converged, though there are varying growth rates within clubs. Based on the spread of convergence, the club has been categorised as Highly converging states (Club 1), Moderately converging states (Club 4), Intermediately converging states (Club 3) and Low Convergence states (Club 2).

Table 2

Average and Pesaran's cross-sectional dependence (PCD)

Variables	G	TR	INV	GFD	INF
High Convergence					
mean	10.8	6.4	26.0	3.1	96.0
sd	4.6	3.2	26.9	2.1	30.7
PCD	2.8***	5.6***	8.8***	5.6***	13.7***
Moderate Convergence					
mean	10.6	4.8	34.6	3.5	99.7
sd	5.7	1.6	37.0	2.2	25.2
PCD	6.5***	2.8***	8.7***	2.8***	-2.5***
Intermediate Convergence					
mean	11.4	6.3	27.7	3.3	94.6
sd	6.8	1.0	23.7	1.6	29.1
PCD	9.5***	8.0***	17.4***	8.0***	21.7***
Low Convergence					
mean	12.0	5.7	47.4	2.4	93.4
sd	4.7	1.5	45.8	2.0	23.2
PCD	2.0***	5.6***	3.4***	5.6***	10.5***

Source: author's calculation

All groups of state's performance in economic indicators over the period of 2001 to 2019 (Table 2) shows that low converging states has highest average per capita income growth rate (12.00) followed by moderately converging states. This indicates that states with high convergence path needs to grip on comparatively high developmental efforts than other states. However, they exhibit more consistent per capita growth rate compared to other groups. It can be noted that the low convergence state present comparatively lower gross fiscal deficit share and investment among the group shows that the low convergence states have highest average compared to other groups. Except the high convergence states, all other groups reveal consistency in the share of their tax revenue.

The statistical significance of Pasaran's cross-sectional dependence (PCD) indicates that unobserved factors influence all the variables across the group. It necessitates using a model that considers the cross-sectional dependence, which will avoid erroneous conclusions about the model under study.

Table 3

The mean group regression result of clubs

Variables	High Convergence	Moderate Convergence	Intermediate Convergence	Low Convergence
TR	2.296 (-1.904)	-1.453 (-2.468)	-2.607 (-3.759)	-1.637 (-3.168)
INV	0.864 (-0.545)	1.752 (-1.481)	0.342 (-0.603)	-0.428 (-0.742)
GFD	-3.006** (-1.403)	0.702 (-2.804)	-0.365 (-1.342)	0.047 (-1.822)
INF	-0.128* (-0.071)	0.035 (-0.089)	0.003 (-0.051)	0.072 (-0.091)
INT_1	0.015 (-0.015)	-0.006 (-0.028)	-0.013 (-0.017)	-0.005 (-0.021)
INT_2	-0.283 (-0.216)	-0.842 (-0.793)	-0.02 (-0.092)	0.175 (-0.207)
Constant	20.496* (-11.627)	11.636 (-18.2)	27.351 (-25.483)	12.434 (-24.705)
Observations	95	133	152	76
R^2	0.140	0.229	0.206	0.226
Multiple R^2	0.475	0.529	0.515	0.527
PCD	0.398	-0.010	3.661***	1.976***

*Source: authors' calculation**Note: ***, **, * indicates 1%, 5% and 10% level of significance, Standard errors are in parenthesis*

The Mean Group (MG) model (Table 3) reveals that except for the High convergence group of states, regressors of all other groups failed to exhibit a significant relationship between regressed and regressors. This indicates that other factors influence the economic growth in these groups of variables. However, considering the model assumption that each state group has unique characteristics that may have varied widely, the significant effect is ruled out. Additionally, low and intermediate convergence states have provided evidence towards the alternative hypothesis of 'cross-sectional dependence'. This may indicate the effect of unobserved common factors across the states. Though the low convergence states do not exhibit cross-sectional dependency, the increase in the fiscal deficit and inflationary pressure retard per capita income growth.

Table 4
Demeaned Group Results

Variables	High Convergence	Moderate Convergence	Intermediate Convergence	Low Convergence
TR	1.047 (-1.159)	-0.429 (-0.885)	-3.073** (-1.464)	-5.387** (-2.435)
INV	0.191*** (-0.049)	-0.033 (-0.196)	0.256 (-0.276)	-0.109 (-0.102)
GFD	-0.658 (-0.853)	1.63 (-2.408)	-1.396 (-1.532)	-5.965 (-5.544)
INF	0.175 (-0.13)	0.194 (-0.206)	0.192 (-0.184)	-0.373 (-0.403)
INT_1	0.013 (-0.012)	-0.014 (-0.023)	0.00003 (-0.016)	0.054 (-0.06)
INT_2	-0.017*** (-0.003)	-0.001 (-0.044)	-0.024 (-0.032)	0.013 (-0.015)
Constant	0.784 (-1.178)	1.075 (-1.46)	-0.669 (-1.682)	-6.058 (-6.729)
Observations	95	133	152	76
R^2	0.172	0.423	0.371	0.450
Multiple R^2	0.494	0.648	0.615	0.664
PCD	-2.844***	-1.998***	0.179	-2.376***

Source: authors' calculation

Note: ***, **, * indicates 1%, 5% and 10% level of significance, Standard errors are in parenthesis

The Demeaned Group Estimator (DMG) across different groups of Indian states (Table 4) reveals mixed effects of the impact of tax revenue on economic growth. As such, increases in tax revenue dampen per capita income growth of low convergence and intermediate convergence states. This could indicate the inefficient utilization of tax revenue. While the increase in investment improves per capita income growth in high convergence states, it explains the effectiveness of investment efforts. All the groups of states except the intermediate converging states group are evidently cross-sectional dependent.

Table 5

Common Correlated Effects Mean Group

CCEMG	High Convergence	Moderate Convergence	Intermediate Convergence	Low Convergence
TR	-3.810* (-2.181)	-5.790*** (-2.024)	-9.456*** (-3.159)	-13.391*** (-3.183)
INV	-2.052 (-2.441)	2.76 (-2.661)	-0.204 (-0.471)	-0.513 (-0.921)
GFD	-9.444 (-6.71)	0.784 (-1.695)	4.535 (-4.293)	4.249 (-6.167)
INF	-0.288 (-0.651)	-0.131 (-0.341)	-0.053 (-0.49)	-0.153 (-0.79)
INT_1	0.089 (-0.058)	-0.009 (-0.016)	-0.058 (-0.042)	-0.043 (-0.05)
INT_2	0.67 (-0.76)	-1.41 (-1.422)	0.051 (-0.09)	0.078 (-0.116)
G_bar	0.725 (-0.441)	0.837 (-0.513)	1.102*** (-0.294)	0.976** (-0.399)
TR_bar	0.709 (-1.413)	2.096 (-7.169)	15.94 (-9.875)	3.717 (-4.539)
INV_bar	-1.273 (-0.925)	-0.15 (-0.714)	1.517 (-1.649)	-0.532*** (-0.152)
GFD_bar	8.458** (-3.835)	-2.669 (-5.985)	2.472 (-6.389)	-1.272 (-10.84)
INF_bar	0.451 (-0.661)	-0.262 (-0.631)	0.256 (-0.479)	0.092 (-0.898)
INT_1 bar	-0.087* (-0.045)	0.03 (-0.05)	-0.003 (-0.067)	0.007 (-0.112)
INT_2 bar	0.171 (-0.111)	0.035 (-0.146)	-0.252 (-0.283)	0.077*** (-0.025)
Constant	16.608 (-30.655)	53.946 (-82.964)	-70.279 (-48.508)	62.386 (-56.93)
Observations	95	133	152	76
R^2	0.279	0.412	0.156	0.617
Multiple R^2	0.840	0.869	0.812	0.915
PCD	-2.384***	-0.918	0.456	-1.427

Source: authors' calculation

Note: ****, **, * indicates 1%, 5% and 10% level of significance, Standard errors are in parenthesis

The Common Correlated Effects Mean Group (CCEMG) (Table 5) shows that an increase in tax revenue reduces the per capita income growth rate across all clubs. In high convergence states, the unobserved common factor proxied by gross fiscal deficit exerts a positive pressure on growth, which indicates that deficit has the potential to improve growth. However, the evidence suggests that inflationary pressure by fiscal deficit led to a reduction in per capita income growth. Moreover, the presence of cross-sectional dependence reveals additional factors that may simultaneously affect these states' economic growth. In low convergence states, in the absence of cross-sectional dependence, the common factor of per capita income growth positively influences economic growth. The common factor based on the interactive term reveals that the effect of investment on growth is influenced by its tax revenue. Except for tax revenue, none of the variables shows statistical significance in moderate and intermediate convergence states despite having no cross-sectional dependence. The effect of insignificant variables across the state may vary, or the dominance of unobserved common factors may be greater, suppressing the impact of individual regressors.

5. Discussion and Conclusion

This study explores the relationship between fiscal deficit and economic growth in Indian states using a combination of club convergence and advanced panel dynamic regression models. We grouped states into homogenous groups with similar growth paths using club convergence to and later identified how fiscal deficits and other economic factors differently influence growth within each group. Thus we intend to extract the effect of heterogeneous and unobserved common factors on the growth of the Indian states. Overall, the findings suggest that the relationship between fiscal deficit and economic growth is complex and varies significantly across different state clusters. Except in high convergence states with cross-sectional dependencies, fiscal deficit shows an inverse relationship with per capita income growth, suggesting a need to scrutinize the quality of deficit budgeting. Conversely, when unobserved factors are considered, the fiscal deficit positively impacts per capita income growth, indicating a complex, interconnected dynamic, while tax revenue and investment negatively affect growth rates. Despite using a homogenous group for testing the impact of deficit on economic growth, the effect of unobserved factors and heterogeneity among the states persist. The insignificant variables in the results may be due to the high variations in unique characteristics of states in each club that throws light on the need for fiscal deficit constraint and also raises a question if states should be given more fiscal

freedom to achieve the development with the economic potential it has. A one-size- fits -all rule for states with such diversity could be detrimental for the states to achieve higher growth overtime. The control on fiscal deficit should be context-specific, which should be an approach taken up by the policymakers to consider the nuances while formulating fiscal policies. It should be also be noted that the pressure on states to limit fiscal deficit within FRBM limits has no statistical validity.

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