

Peer-reviewed research

Is There a Systematic Bias in Budget and Revised Estimates of Gross Fiscal Deficit?

Y N Raju¹, Chandan Kumar Mohanty^{1a}, Asit Ranjan Mohanty²¹ Centre of Excellence in Fiscal Policy and Taxation, XIM University, Bhubaneswar, India, ² Xavier Institute of Management, XIM University, Bhubaneswar, India

Keywords: Budget estimate, Revised estimate, Gross fiscal deficit, Fixed-effects regression

JEL Classifications: C23 Panel Data Models - Spatio-temporal Models, H3 Fiscal Policies and Behavior of Economic Agents, H68 Forecasts of Budgets, Deficits, and Debt, H7 State and Local Government - Intergovernmental Relations, H72 State and Local Budget and Expenditures

<https://doi.org/10.46557/001c.123246>

Asian Economics Letters

Vol. 6, Issue 3, 2025

This study examines the Budget Estimate (*BE*) and Revised Estimate (*RE*) of Gross Fiscal Deficit (*GFD*), using Indian state-wise data spanning 2006 to 2020. Both *RE* and *BE* of *GFD* hold significant policy implications until the final data becomes available. The study uncovers a consistent bias in *RE* compared to *BE*. Therefore, as an interim measure, policymakers and researchers can utilize *BE* instead of *RE* for macro-fiscal analysis in the absence of actual *GFD* data. This preference for *BE* stems from its superior ability to approximate the actual *GFD*.

I. Introduction

Throughout the fiscal year, estimates of key budgetary measures such as revenue receipts, expenditures, deficits, and capital transactions fluctuate, impacting the implementation of vital schemes by both central and state governments in India. Achieving accurate estimates poses a significant challenge. In budget formulation and discussions on public economics, Budget Estimates (*BE*) and Revised Estimates (*RE*) are pivotal, awaiting the arrival of actual figures for macro-fiscal indicators. Traditionally, Indian states unveil their annual budgets and *BE* around the Union Budget presentation day (1st February), with *RE* becoming available towards the fiscal year's end. Actual figures typically emerge approximately a year after *RE*, while they are accessible about two years after *BE*. The *BE* offers a projection at the fiscal year's onset, setting the trajectory for subsequent financial planning.

This paper investigates potential biases inherent in *BE* and *RE* compared to actual figures within the above context. This analysis aims to assist policymakers in selecting between these two measures for further examination until actual data becomes available. Specifically, the study focuses on the Gross Fiscal Deficit (*GFD*), a crucial macro-fiscal indicator, using state-wise Indian data from 2006 to 2020. It identifies a systematic bias in *RE* compared to *BE*, prompting a recommendation for policymakers and researchers to rely on *BE* as an interim measure for macro-fiscal analysis across Indian states when actual *GFD* figures are unavail-

able. This preference for *BE* stems from its superior ability to approximate the actual *GFD*.

This paper builds on the two notes published by the Reserve Bank of India (*RBI*) in its 2020-21 and 2022-23 reports of "State Finances: A Study of Budgets". There is a bias in the *RE* compared to *BE* and Provisional Accounts (*PA*) of *GFD*. Therefore, *BE* and *PA* can be used for policy analysis instead of *RE* (Reserve Bank of India, 2020). Using statistics, such as Mean Error, Mean Absolute Error, Root Mean Square Error, and Theil's U statistics, a recent study finds that errors are higher in *RE* than in *BE* (Reserve Bank of India, 2022). Barring the two studies of *RBI*, the literature addressing the controversy about *RE* and *BE* is limited in India.

The *RBI* (2020) is a panel study of 24 Indian states for 2014-2019, and the *RBI* (2022) study estimates the bias considering 2017-2020. These studies need an extended time frame to draw any concrete conclusions regarding the bias in the *RE* and *BE* of *GFD*. Furthermore, these studies need more clarity on the selection of 24 states. However, we examine the nature of bias in *RE* and *BE* in two different panels of states, 17 non-special and 11 special states, for a longer timeframe, 2006-2020. The extended timeframe enables us to assess biases effectively compared to the two *RBI* studies. Therefore, our study can potentially fill the gap in the empirical literature that assesses the bias in the *RE* and *BE* of *GFD* in India. For ease of temporal comparison and consistency, we start our analysis from 2006-07, the post-period of the Fiscal Responsibility and Budget Management (*FRBM*) Act in India. The *FRBM* was effective from

a Corresponding author email: chandaneco.jnu@gmail.com

July 5, 2004. We believe the period after *FRBM* will likely differ from the pre-*FRBM* period in terms of the government's taxation and spending behaviour.¹

The rest of the paper proceeds as follows. Section II briefly discusses the political economy of fiscal deficit. Section III demonstrates the data and method used in the paper. Section IV discusses the empirical results. Section V concludes the paper with some policy implications.

II. Political Economy of Fiscal Deficit in India

Fiscal deficit measures the government's borrowing needs for a budget year to finance expenditures, including interest payments. Standard economics claims that fiscal deficits are a consequence of consumption smoothing efforts by the government (Barro, 1979). However, deficits are inevitable in economic contractions owing to reduced tax collection when the government maintains a steady flow of expenditure and tax rates to facilitate smooth consumption. In many instances, governments amass debt beyond levels that could be explained by consumption smoothing theories (Alesina & Perotti, 1995). Here, possible new explanations of fiscal deficits, such as political factors, are warranted. The political economy of fiscal deficit gives a perspective on the bias inherent in BE and RE of the deficit. In the interest of brevity, the influence of political considerations on fiscal policymaking can be summarized as follows.

First, political economy posits that conflicts of interest affect deficits. This strand of literature is based on the principle that voters make consistent mistakes where fiscal illusion plays a central role. The three fundamental elements of fiscal deficits are the outcome of opportunistic politicians as follows. Opportunistic policymakers target votes for themselves or their parties and are prone to tilt economic policy to realize that goal. In many instances, voters value public expenditure for the direct impact of government programmes or the expansionary outcomes of expenditure hikes. In this approach, voters are assumed to fall into the trap of 'fiscal illusion'; that is, they consistently underestimate the future costs of current spending programs (Buchanan & Wagner, 1977). Nordhaus (1975) also supports the framework of opportunistic politicians gener-

ating deficits to win elections at the cost of the general welfare.

Second, policymakers have diverse partisan preferences. The incumbents choose to run deficits because of divided interest among politicians' partisan preferences. The fiscal deficit arises if politicians have diverse fiscal preferences. The argument that incumbent officials prefer deficits to limit their successor's financial management freedom is plausible. This argument rests on the hypothesis that current budget deficits impose costs in terms of reduced future public spending or increased future tax collections (Alesina & Tabellini, 1990). Later, Alt & Lassen (2006) popularised models of strategic deficits based on politicians' heterogeneous preferences about the structure of public expenditure.

Third, disagreements of interest between social groups or regions produce tensions in distributing government resources, resulting in overspending. Studies show deficits owing to the conflict between groups with diverse expenditure preferences over the allocation of government revenues. Theoretical inputs within this branch of the literature link fiscal outcomes to the nature of the electoral system, democracy types, and the degree of cohesion or fragmentation within the government.

Given this snapshot understanding of possible causes of fiscal deficit, this paper does not claim to explore any reasons for the deficit, albeit the paper restricts its purview only to the empirical assessment of the two measures of *GFD*: *RE* and *BE*.²

III. Data and Methodology

A. Data

We use the *GFD*, calculated as a percentage of Gross State Domestic Product (*GSDP*), data from 2006-07 to 2020-21, provided by the Budget Documents of various state governments and the Comptroller and Auditor General (*CAG*), Government of India. We focus on the 17 non-special category states, which are considered to be the major Indian states in terms of the size of the economy. However, the 11 special category states are also considered to buttress our main finding.³ Telangana is excluded from our analysis since our period starts from 2006-07, and this

¹ In the pre-*FRBM* period, since there was no set goal of *GFD* (3% of *GSDP*), the states would behave differently in fiscal management compared to the post-*FRBM* period, where this mandate of *GFD* would certainly push states to adopt different fiscal strategies. Furthermore, Indian states have shown increasing tendencies to opt for market-oriented borrowing with lower interest rates compared to the pre-*FRBM* period. The lower interest rates make borrowing cheaper and, therefore, spending higher. Given these scenarios, we suspect a change in the trend of *GFD* across states before and after the *FRBM* Act 2005. Therefore, the analysis of the post-*FRBM* period allows us to avoid heterogeneity that might dilute our results.

² For a detailed survey of the literature on political economy of fiscal deficits, refer to Eslava (2011).

³ The 17 non-special category states are Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. The 11 special category states are Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, and Uttarakhand, which receive special grants from the Indian Government for each budget years, unlike the non-special category states. Studying the sample of special category and non-special category states separately in the context of one key fiscal indicator, *GFD*, allows us to avoid the problem of severe heterogeneity at the state level.

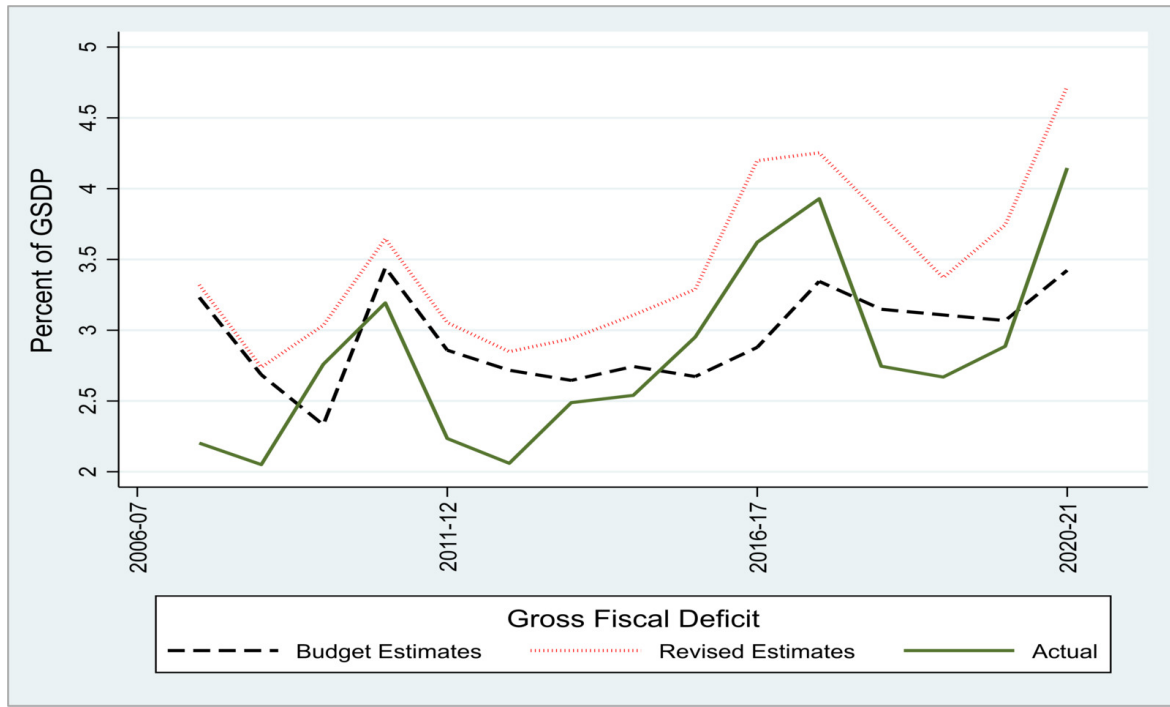


Figure 1. Estimates of GFD (sample of 17 non-special category states), 2006-2020

Source: Authors' calculation

state came into existence in 2015-16. *GFD* is the aggregate expenditure (aggregate disbursement net of debt repayments) minus revenue and non-debt capital receipts. We calculate two gaps, *Gap1* and *Gap2* of *GFD* as follows:

$$Gap1 = Actual\ Estimate - BE \quad (1)$$

$$Gap2 = Actual\ Estimate - RE \quad (2)$$

Figure 1 shows the behaviour of *BE*, *RE*, and Actual *GFD*s for the sample of 17 non-special states during 2006-2020. These estimates are averaged over our sample states. The *RE* of *GFD* is distinctly above the *BE* and Actual of *GFD* over our study period. The *BE* is between *RE* and Actual around the first half of our study period, and the Actual remains between *RE* and *BE* around the latter half. *BE* was above the Actual estimate in the first half of our sample period because the budgeted capital expenditure was not realized for most states in the first half, i.e. before 2015-16. For the significant part of the second half (after 2015-16), Actual estimates of *GFD* remained above *BE* due to an increasing focus on capital spending in recent periods where the realized amount exceeded the budgeted amount, leading to higher Actual *GFD* than *BE*. The pattern in Figure 1 is generally reflected in individual states. It is more pronounced in 11 special category states (see Appendix, Figure A4) compared to 17 non-special states (see Appendix, Figure A3). Figure 2 plots *Gap1* and *Gap2* (represented by the y-axis) against

the actual *GFD* (represented by the x-axis). It shows that both the gaps increase with the actual *GFD* over our sample period. *Gap2* (Actual-*RE*) scatteredness is higher than *Gap1* (Actual-*BE*). Broadly, we observe the same patterns of Figures 1 and 2 in our sample of 11 special category states (refer to Figures A1 and A2 in the Appendix). For a better understanding, the state-wise (17 non-special and 11 special states) characteristics of *RE*, *BE*, and Actual *GFD*s are shown in Figures A3 and A4 of the Appendix.

B. Econometric Method

To examine which is a relatively better measure between *BE* and *RE* of *GFD*, we employ a fixed-effects panel data estimation model shown in Equation (3).⁴

$$Gap_{it} = \partial_{it} + \varepsilon_{it} \quad (3)$$

where *i* denotes the state with $i = 1, 2, \dots, N$ and *t* denotes the number of years with $t = 1, 2, \dots, T$. The dependent variable is *Gap*. We construct two gaps: *Gap1* and *Gap2*. *Gap1* is the difference between the Actual/Accounts and the Budget Estimates (Actual-*BE*), and *Gap2* is the difference between the Actual/Accounts and the Revised Estimates (Actual-*RE*). Therefore, *Gap_{it}* denotes the considered gap in the state *i* in year *t*. ∂_{it} is the measure of intercept in state *i* in year *t*. Note that, to test the means of these gap variables in the

⁴ The simplest regression model is intercept-only without any explanatory variable, where the estimated intercept is the sample mean of the dependent variable. In this paper, we implement intercept-only linear regression in a panel data setup. While we could have used the *summarize* command in Stata, using the *regress* or *xtreg* command is helpful afterwards, and one can use various post-estimation commands.

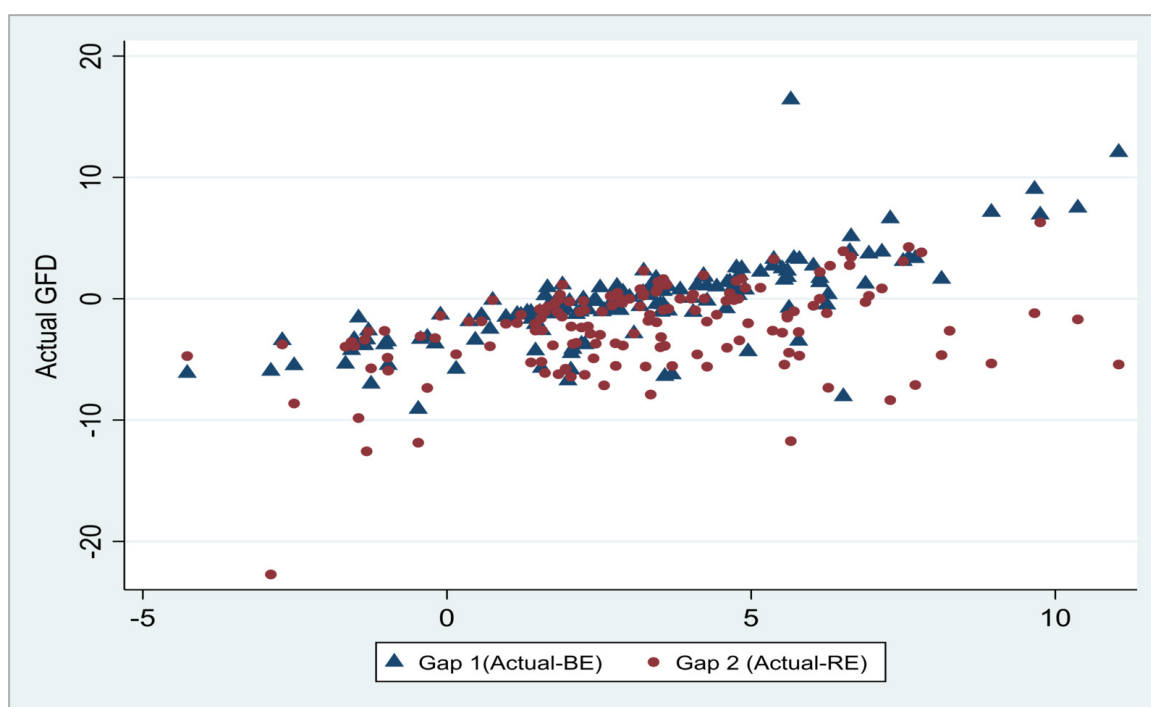


Figure 2. Scatter plot: Actual GFD, Gap1, and Gap2 (sample of 17 non-special category states)

Source: Authors' calculation

panel fixed-effects framework, we do not include any explanatory variables since our aim is not to study the causal determinants of the gaps. Here, we estimate Equation (3) to investigate whether the intercept coefficient is statistically close to zero. Suppose the averages of the constructed gap variables are statistically different from zero at the standard level of significance. Then, we conclude the presence of bias (positive/negative), conditional on the signs of the coefficients.⁵

First, we execute our estimation in the sample of 17 non-special category states for 2006-2020 (17 states*15 years = 255 observations of state-year). Subsequently, we conduct a robustness test by experimenting with our main results with 11 special category states for the same period (11 states*15 years = 165 observations).

IV. Empirical Analysis

The results from the 17 non-special states suggest that the average gap between Actual and BE (*Gap1*) is not (statistically) different from zero, suggesting that averages of *Gap1* across states are almost the same. In contrast, the difference between Actual and RE (*Gap2*) is statistically significant, as shown in panel-a of Table 1. The negative and statistically significant sign on the coefficient of *Gap2* suggests an upward bias in RE.

How do these findings behave if we consider the 11 special states in our analysis? Here, *Gap1* is insignificant, and *Gap2* is significant (shown in panel-b of Table 1), concurring with the findings of the sample of 17 non-special states. The only difference is that now the size of the upward bias in RE in the special category states' sample is higher than in the sample of non-special states since the coefficient of *Gap2* is now -2.27 (Panel-b) as opposed to the earlier coefficient of -0.617 (panel-a). This difference is because the GFDs of the non-special category states are better projected than the GFDs of special states.

To sum up, we can draw upon three points from our empirical analysis. There exists a bias in the RE of GFD, no matter how we define our sample (17 non-special or 11 special category states). Our finding of bias in RE concurs with the findings of RBI (2020) and RBI (2022). The bias size is more prominent in the sample of special category states than in the non-special category states. No systematic bias is involved in the BE of GFD across our samples of states.

V. Conclusions

The paper assesses two metrics, BE and RE, of GFD using data from Indian states spanning from 2006 to 2020. It uncovers a consistent bias in RE compared to BE. Consequently, policymakers and researchers can use BE as a temporary measure for macro-fiscal analysis across Indian

⁵ Note that ANOVA can be an alternative to our empirical analysis. However, we prefer the fixed-effects model to compare and contrast our results with the RBI study, which uses the same methodology of fixed-effects regressions. Secondly, the fixed-effects model considers unobserved heterogeneity by estimating the means, while ANOVA fails.

Table 1. Measuring bias in Revised Estimates (RE) and Budget Estimates (BE) of GFD

Dependent variable	Intercept	Std.Error	t—statistics	P-value	Remark
Panel A: Panel Fixed Effects Regression for 17 Non-Special Category States					
Gap 1 (Actual-BE)	-0.102	0.081	-1.26	0.210	Mean is same
Gap 2 (Actual-RE)	-0.617	0.053	-11.65	0.000***	Mean is different
Panel B: Panel Fixed Effects Regression for 11 Special Category States					
Gap 1 (Actual-BE)	-0.278	0.265	-1.05	0.296	Mean is same
Gap 2 (Actual-RE)	-2.27	0.262	-8.66	0.000***	Mean is different

Note: *** indicates significance at less than 1% level.

Source: Authors' calculation

states until actual figures are available. This recommendation stems from the observation that *BE* more closely mirrors the actual *GFD*, contrary to the common belief that *RE* provides a better approximation due to being based on actual data from certain months within a year.

Submitted: January 19, 2024 AEST. Accepted: June 07, 2024 AEST. Published: September 01, 2025 AEST.



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CCBY-SA-4.0). View this license's legal deed at <https://creativecommons.org/licenses/by-sa/4.0> and legal code at <https://creativecommons.org/licenses/by-sa/4.0/legalcode> for more information.

References

- Alesina, A., & Perotti, R. (1995). The political economy of budget deficits. *IMF Staff Papers*, 42(1), 1–31. <https://doi.org/10.2307/3867338>
- Alesina, A., & Tabellini, G. (1990). Voting on the budget deficit. *American Economic Review*, 80(1), 37–49.
- Alt, J., & Lassen, D. (2006). Fiscal transparency, political parties, and debt in OECD. *European Economic Review*, 50(6), 1430–1439. <https://doi.org/10.1016/j.euroecorev.2005.04.001>
- Barro, R. (1979). On the determination of the public debt. *Journal of Political Economy*, 87(5), 940–947. <https://doi.org/10.1086/260807>
- Buchanan, R., & Wagner, J. (1977). *Democracy in Deficit*. Academic Press.
- Eslava, M. (2011). The political economy of fiscal deficits: A survey. *Journal of Economic Surveys*, 25, 645–673. <https://doi.org/10.1111/j.1467-6419.2010.00647.x>
- Nordhaus, W. (1975). The political business cycle. *Review of Economic Studies*, 42(2), 169–190. <https://doi.org/10.2307/2296528>
- Reserve Bank of India. (2020). Is there a Systematic Bias in Revised Estimates? In *State Finances: A Study of Budgets of 2020-21* (pp. 4–5). RBI.
- Reserve Bank of India. (2022). States' Fiscal Marksmanship. In *State Finances: A Study of Budgets of 2022-23* (p. 6). RBI.

Appendix

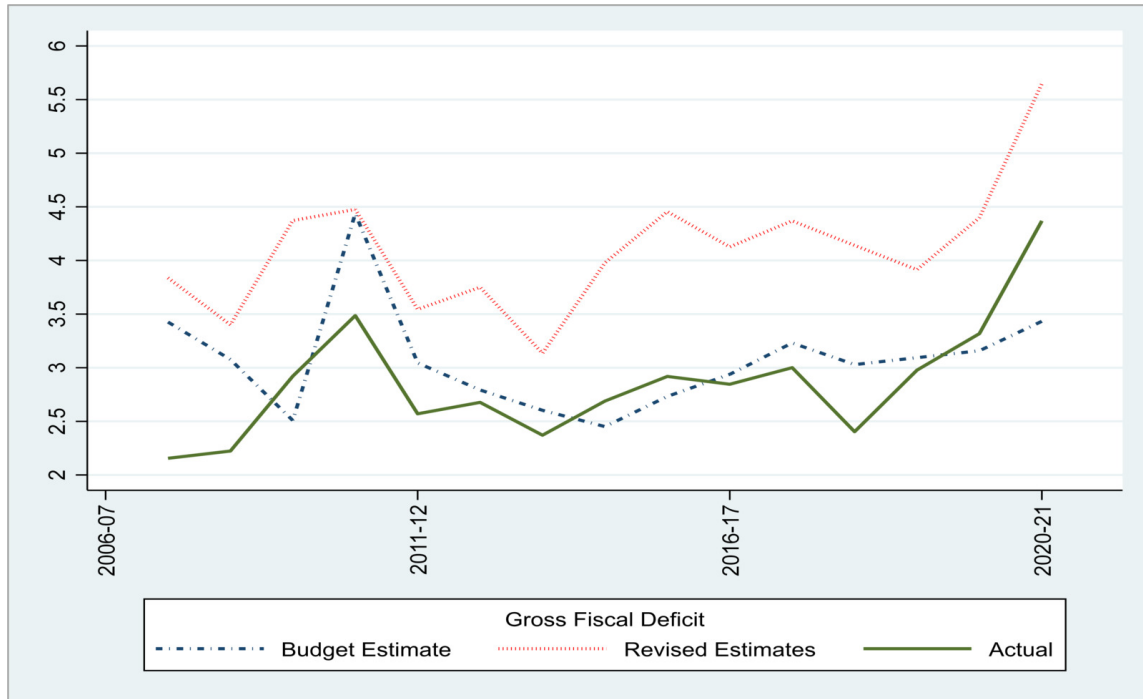


Figure A1. Estimates of *GFD* (sample of 11 special category states), 2006-2020

Source: Authors' calculation

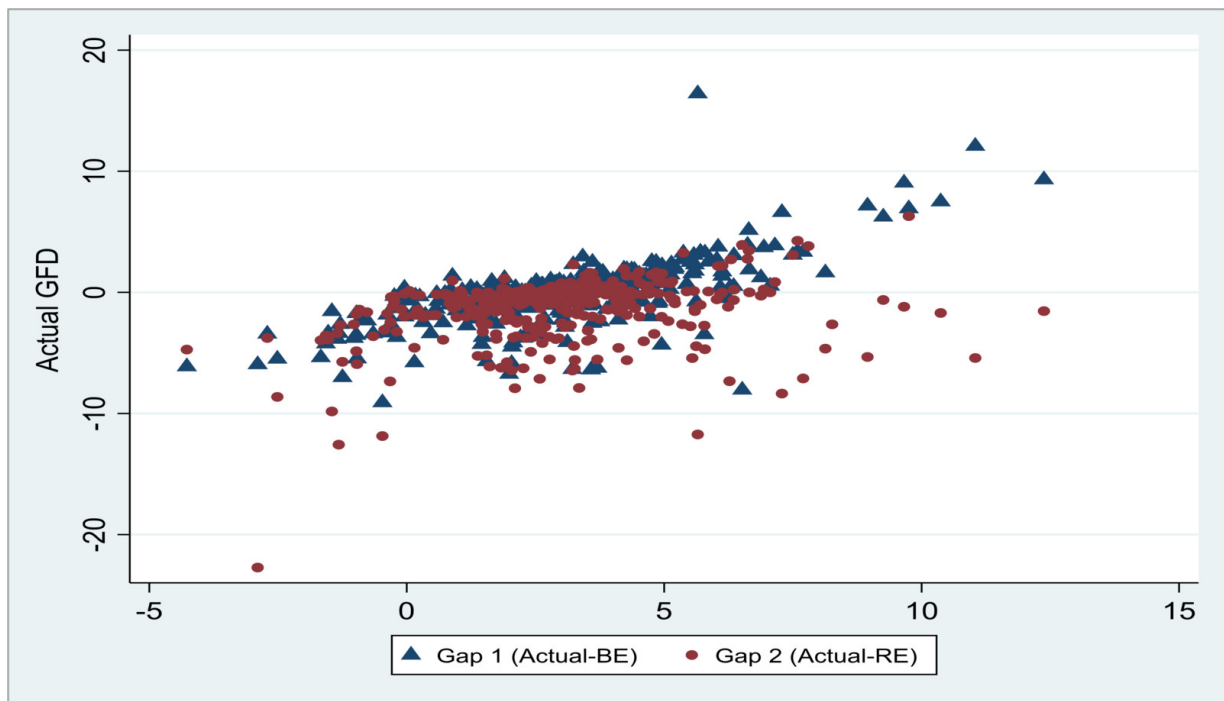


Figure A2. Scatter plot: Actual *GFD*, *Gap1*, and *Gap2* (sample of 11 special category states)

Source: Authors' calculation

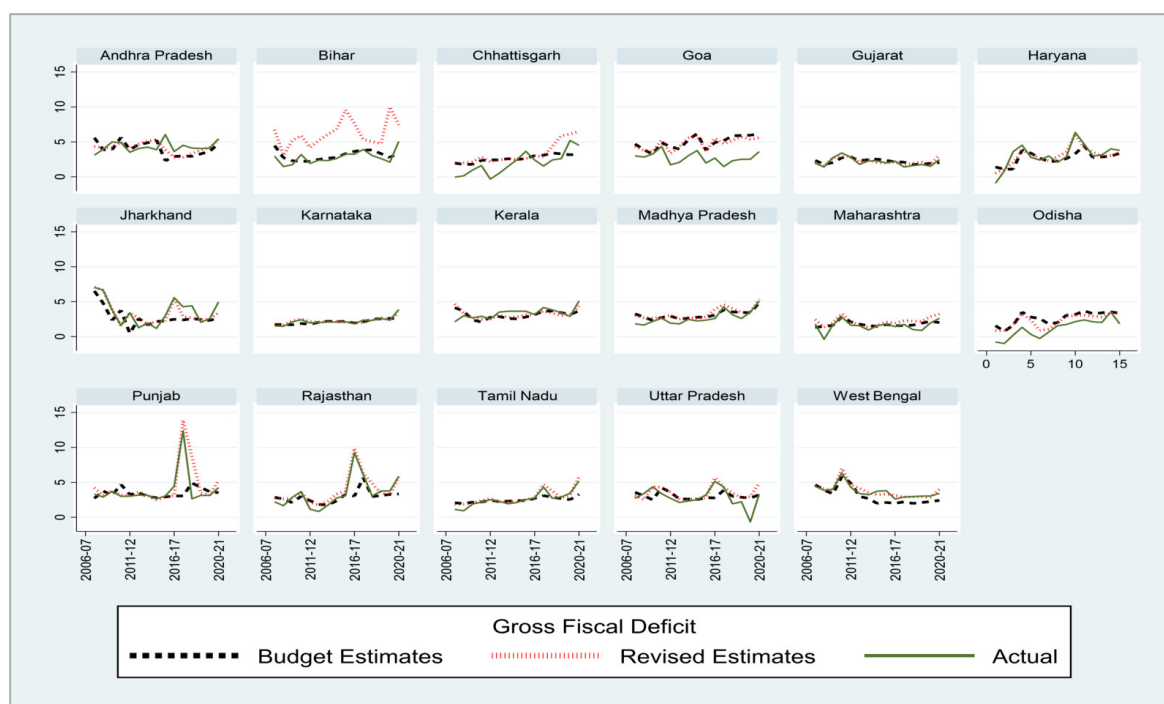


Figure A3. State-wise estimates of GFD (sample of 17 non-special category states), 2006-2020

Source: Authors' calculation

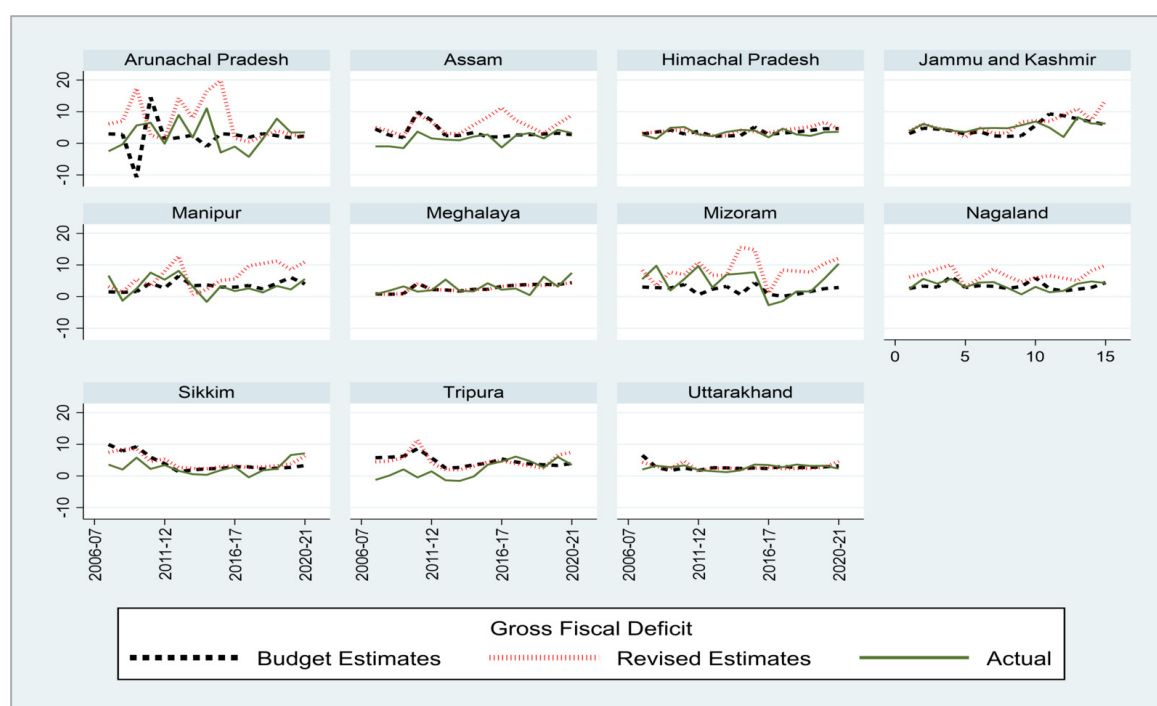


Figure A4. State-wise estimates of GFD (sample of 11 special category states), 2006-2020

Source: Authors' calculation