

## Fiscal Sustainability in the Indian States: A Panel ARDL Approach

*Priyadarshini Ashok Patil*

Research Scholar,

Department of Economics,

Karnataka University

Dharwad,

*priyadarshinipatil220@gmail.com*

*R. R. Biradar*

Professor,

Department of Economics,

Karnataka University,

Dharwad

### Abstract

In this paper, we examine fiscal sustainability for 20 Indian states over the period 1991-2021 by using an ARDL panel approach, which accommodates variables that may be of different integration orders. In the present study, we have estimated the short-run and long-run relationship between debt-to-GDP and government primary balance and found that the Indian states are fiscally sustainable in the short and long run. Panel Granger causality test results indicate that there is unidirectional causality from debt to the primary balance.

### 1. Introduction

Fiscal policy is a significant determinate of the economic environment in any country, especially in developing nations like India. A stable fiscal environment is crucial for realizing economic goals, as it can, depending on how income is collected and disbursed, ignite growth or address the challenges of current and future generations. However, in most developing countries, fiscal policy is somewhat restricted due to issues with domestic mobilization of resources, institutional inefficiency, and generally low tax bases ( Hussain et al. (2021), Alshaib). Sub-national governments across the world, with the recent global trend toward decentralization, have been saddled with added responsibilities pertaining to the delivery of public goods and services and investment in infrastructure. Most of these governments have a rising expenditure requirement, with a deficiency in the revenue that comes in, and so have to fall back on borrowed resources. Borrowing is not, *per se*, bad if used for productive investment, but unproductive utilization of borrowed resources can create an unsustainable level of debt, thereby posing a threat to fiscal sustainability, macro, and financial stability.

State governments in India have increasingly resorted to borrowings for meeting their growing development needs, with rising concerns regarding the sustainability of their fiscal practices. In this respect, fiscal sustainability would be a big concern for the state governments in as much as it is very closely associated with the notion of reaching development sustainability—that is, closing financing gaps, reducing debt burdens, and maintaining stability in the macro economy. Sub-nationally, sustainable fiscal policies will be imperative as stable public finances are favorable for infrastructure investment, service delivery, and growth. Fiscal sustainability also empowers the states to resist external shocks and work toward long-term inclusive growth. As estimated by Canagarajah et al., the fiscal unsustainability for longer periods may lead to a fiscal crisis much earlier than the expectation

of the fiscal planners. Budgetary and fiscal sustainability of Indian states, therefore, will be crucial in determining the long-run development path and growth rate in the economy. .

The present paper seeks to discuss fiscal sustainability issues in 20 major Indian states from 1991 to 2021, presenting empirical evidence and analyzing both short-run and long-run fiscal sustainability within the frame of the panel autoregressive distributed lag model. In fact, this ARDL approach is particularly suited to this analysis, since one of its strengths is that it accommodates series which are integrated of different orders, i.e., I(0), I(1), or a cointegration of both. This study also computes the panel Granger causality tests based on Dumitrescu and Hurlin. The methodology undertaken in this paper adds weight to the current debate on fiscal sustainability in Indian states and hence provides an idea about fiscal vulnerabilities and their risks faced by such sub-national entities. It fills in vital pieces of information on how states can actually align their fiscal practices with the national aspiration of *Viksit Bharat @ 2047*.

The paper is organized as follows: The next section gives the definition of fiscal sustainability. Section 3 gives a brief review of the literature. Section 4 computes fiscal sustainability in detail. Section 5 focuses on data. The econometric methodology is developed in Section 6, while the empirical results are exposed in Section 7, followed by conclusions in Section 8.

## **2. Defining Fiscal Sustainability**

**Fiscal sustainability, or public finance sustainability**, is the ability of a government to sustain its current spending, tax and other policies in the long run without threatening government solvency or defaulting on some of its liabilities or promised expenditures. There is no consensus among economists on a precise operational definition for fiscal sustainability; rather different studies use their own, often similar, definitions (Krejdl, Ales (2006), Franco, D. (2000), Burnside, Craig (2005)). The European Commission defines public finance sustainability as: the ability of a government to sustain its current spending, tax and other policies in the long run without threatening the government's solvency or without defaulting on some of the government's liabilities or promised expenditures. One common practical approach to assessing fiscal sustainability uses non increasing government debt as a benchmark to distinguish sustainable fiscal policy from those that are unsustainable (IMF 2000). According to **Blanchard (1990)**: fiscal Sustainability is defined as the ability of a government to ensure that the debt-to-GDP ratio converges back towards its initial level, preventing excessive debt accumulation. IMF provides its definition of fiscal sustainability based on stabilizing the public debt ratio to GDP at a certain level or setting a specific target percentage. In this context, IMF regards fiscal policies of any country as sustainable if they generate constancy in the ratio of public debt-to-GDP. The ratio would become an important indicator regarding the ability of the government to manage its debt in a sustainable manner without allowing undue indebtedness. A stable debt-to-GDP ratio can signal that the government can balance its budget over the long term and avoid borrowing to meet its expenses (Akyuz, 2007). At last, we can say that fiscal sustainability is fundamentally about a government's ability to maintain stable debt levels relative to GDP, ensuring long-term financial health without risking insolvency or excessive indebtedness.

## **3. Literature Review**

### **Theoretical literature**

The generally used framework to examine the government primary balance response to lagged public debt is Bohn's approach. According to Bohn's (1998) if the primary balance is able to react systematically to changes in the sovereign debt, it can be claimed that fiscal policy is sustainable. By

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contrast, in the scenario in which there is a negative relationship between these variables, debt would become unsustainable.

According to Keynes (1971) a sustainable fiscal policy is achieved when government satisfies its budget constraint. In particular, an economy can be endangered when the government debt to GDP ratio reaches an excessive value. In the other words fiscal policy is sustainable if the government revenue are sufficient to continuing financing cost of new public debt issuance. In the case of unsustainability, the government would have to raise taxes or decrease expenditures.

Canzoneri et al (2001) provide the forward looking approach, where fiscal policy is sustainable when a higher primary surplus today can produce a decrease in the future level and it is also called as fiscal dominance. The backward-looking approach given by Bohn(1998) necessitates the examination of cointegration relationship between a lagged level of debt and primary surplus and it is called as monetary dominance.

The necessary condition for fiscal policy sustainability is the stationarity of the public debt at the first difference integrated of order zero. Another important analytical technique is to make the cointegration of government expenditures and government revenues is ascertained. Such practices are carried out in the direction of checking sustainability of public finance.

***Empirical Literature***

In the literatures, recent studies have been wrapped around the fiscal sustainability theme across different regions and economies. Alshaib et al. (2023) examined the relationship between fiscal sustainability indicators and economic growth in Egypt over the period spanning from 1980 to 2018. Using the ARDL bounds testing method and an unrestricted error correction model, they established that the impact of government expenditure and external debt was highly significant in the long run, but that of government revenue had no significant impact. The same study, Syed et al. (2023), looks at public debt sustainability in a sample of 29 Sub-Saharan African economies over the period between 1996 and 2020. Using Bohn's framework with panel unit root, alongside quantile regressions, it concludes that public debt was sustainable and violated no intertemporal budget constraint. Ramos-Herrera and Prats (2023) study the panel ARDL and panel Granger causality tests on 20 European Union countries for the period of 2000 to 2019. The results showed that the fiscal sustainability was short-term and not long-term. However, debt and the primary balance of the government had a bi-directional causality.

Different research has done fiscal sustainability analysis over the Indian central level and states. Rath and Sachan (2021) examined the fiscal sustainability of the central government of India for the period of 1979-80 to 2018-19; they found that declining revenue growth has finally been caught up with by downward trend of central government expenditure as a proportion of GDP, thus putting into jeopardy long-term sustainability. Ranjith and Shanmugam (2019) analyzed the state-level debt sustainability of 22 Indian states from 2006-07 to 2015-16, concluding that although aggregate debt is sustainable, only 11 of them showed high sustainability, while underlining the role of central government grants in undermining it. Akram and Rath further analyzed fiscal sustainability across Indian states from 1980-81 to 2017-18, finding strong sustainability in Northern, Western, and Southern states in comparison with their Eastern counterparts. Finally, Llorca (2017) assessed the sustainability of external debt in 24 Asian emerging and developing countries from 1993 to 2014 and concluded that, in the long run, this can be managed to be sustainable for these economies.

***4. Fiscal Sustainability***

Fiscal sustainability is explained by using Bohn's recommendation the government's intertemporal budget constraints expressed in GDP percentage.

$$D_t = \sum_{j=0}^{\infty} \left(\frac{1+g}{1+r}\right)^{j+1} GPB_{t+j+1} + \lim_{j \rightarrow \infty} \left(\frac{1+g}{1+r}\right)^{j+1} E_t D_{t+j+1}$$

Here  $D_t$  is Public Debt as percentages of GDP,  $GPB_t$  is Government Primary Balance as percentages of GDP,  $g$  and  $r$  represents the growth rate for real GDP and the real interest rate, respectively.  $E_t$  is the expectation operator conditional on the information available at time  $t$ . Therefore, assuming these last parameters as constant, the transversality (no Ponzi games) condition can be postulated as:

$$\lim_{j \rightarrow \infty} \left(\frac{1+g}{1+r}\right)^{j+1} E_t D_{t+j+1} = 0$$

The government's fiscal policy is solvent when the expected future budget surpluses, measured as present value, coincide with its outstanding public debt.

Quintos (1995) differentiates between "weak" and "strong" fiscal sustainability. He posits that public debt can either be  $I(1)$  or  $I(2)$ . More specifically, he asserts that when  $\Delta D_t$  is  $I(0)$ , fiscal sustainability is strong, implying deficits cannot persist in the long term. However, if  $\Delta D_t$  is  $I(1)$ , the government can still maintain its sustainable fiscal policy but it will be achieved by running a deficit, which implies that the revenues will not be able to cover the increased need for public expenditure, thus representing a problem of the deficit financing strategy. This is the situation where the fiscal policy rule is weakly sustainable.

This study centers on the policy rule proposed by Bohn.

$$GPB_{it} = \alpha_i + \beta D_{it-1} + \varepsilon_{i,t}$$

$GPB_{it}$  represents the government primary balance as a percentage of the potential GSDP and  $D_{it-1}$  is the (lagged) debt- potential GSDP ratio.  $\beta$  is the marginal response of the primary balance to debt. A positive  $\beta$ , as obtained by Bohn, implies that rising public debt is associated with an increased primary surplus. This, again, tends to drive down debt and hence implies that sovereign debt will be sustainable in the long run, assuming this policy rule is also followed in the future.

## 5. Data

This is based on secondary data. It uses annual time series for 20 states of India from 1991 to 2021 period. In particular we have considered the following states based on availability of the data pertaining to selected variables- Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. Data collected from RBI Handbook of Statistics on Indian economy. Variables are considered as percentage of potential GDP. In particular, we use the cyclically adjusted general government primary balance as a percentage of potential GSDP and the gross public debt as a percentage of Potential GSDP.

## 6. Econometric Methodology

### 6.1. Panel Unit Root Tests

Before estimation, we check for stationarity among the variables by using unit root tests. More precisely, we apply the Levin-Lin-Chu, the Im-Pesaran-Shin, and the Fisher-type tests in order to determine the order of integration for each variable. The common null hypothesis for the above mentioned tests assumes that all panels contain a unit root.. Each test is carried out using the variables both in levels and first differences.

### 6.2 Panel Cointegration Tests

Once the unit root for panel is established, the next logical step would be to perform tests whether there is a long-run equilibrium relationship amongst the variables. This can be done by conventional panel cointegration tests such as by Kao , Pedroni and Westerlund . In this study both the variable do not have the same order of integration, so alternative technique is needed.

### 6.3. Dynamic Panel Model ARDL

The standard static panel models namely the pooled OLS, fixed effects, or random effects have not been able to capture either the short- or long-run relationships among the variables. Furthermore, Campos and Kinoshita underline that all these models yield biased estimates in the case of the regressors being endogenous-which could be a problem in our sample. Dynamic panel models, on the other hand, such as the GMM-difference estimator by Arellano and Bond and the GMM-system estimator by Arellano and Bover, become useful if the sample contains a large number of countries relative to the time period. In our case, though, the focus is not on short-run dynamics, and the structure of our sample is different; hence, these GMM methods will be less suitable. In view of these impossibilities, the panel ARDL approach represents one of the best alternatives. The ARDL is quite helpful since it accommodates variables that are integrated of different orders, namely I(0), I(1), or even a combination of the two. This dynamic panel regression can be presented using the ARDL approach, denoted as (p, q) below, within the structure of an error-correction model.

$$GPB *_{it} = \sum_{j=1}^{p-1} \gamma_j^i GPB_{i,t-j} + GPB *_{it} \sum_{j=0}^{q-1} \delta_j^i \Delta D *_{i,t-j} + \varphi^i [GPB_{i,t-1} - \{\beta_0^i + \beta_1^i D *_{i,t-1}\}]$$

where p and q are the lags of the dependent and independent variables, respectively. GPB\* it is the government primary balance as a ratio of potential GDP and D\* it is the debt-potential GDP ratio. In particular,  $\gamma$  represents the short-term parameters of the lagged dependent variable;  $\delta$  refers also to the short-run coefficients but of the lagged explanatory variables, which in our case is debt.  $\varphi$  reflects the speed of adjustment to the long-run equilibrium.  $\beta$  indicates the impact of debt in the long run. It can be estimated by ARDL , PMG( Pooled Mean Group ).

### 6.4. Panel Granger Causality Based on the Dumitrescu and Hurlin Test

Another interesting issue is the causal relationship between our variables. Again, note that the idea is based on the concept Granger, on time series, has proposed this, and an extension to this was derived by Dumitrescu and Hurlin .The task remains to identify the existence of causality among the variables in a panel data set-up. From such authors, we would be able to devise Then Granger causality in our model as follows by testing the causality running from debt to the primary balance is the opposite way round in particular as follows:

$$GPB *_{it} = \alpha_i + \delta_{i,1} GPB_{i,t-1} + \dots + \delta_{i,p} GPB_{i,t-p} + \beta_{i,1} D *_{i,t-1} + \dots + \beta_{i,p} D *_{i,t-p} + \varepsilon_{i,t}$$

where GPB\* it and D\* i,t are stationary variables for country i in period t (in this regression, we work with the first difference of debt because stationarity is a requirement).

## 7. Empirical Results

### 7.1 Descriptive Statistics



**Table 1. Descriptive Statistics**

variable	Mean	Standard Deviation	Minimum	Maximum
$GPB^*_{it}$	<b>1.903572</b>	<b>6.275124</b>	<b>-32.31276</b>	<b>72.50094</b>
$D^*_{it}$	<b>51.48197</b>	<b>60.37979</b>	<b>-74.57233</b>	<b>446.4823</b>

Table 1 describes the main descriptive statistics for the variables in our analysis. The average value of  $GPB^*_{it}$  is 1.9036%, with a standard deviation of 6.2751 with minimum and maximum ranging from -32.31% to 72.50%. The average for  $D^*_{it}$ , meanwhile, is 51.4820% and its standard deviation is at 60.3798. The minimum and maximum values of  $D^*_{it}$  range from -74.57% to 446.48%.

### 7.2 Panel Unit Roots and Cointegration

**Table 2. Panel unit roots results**

Test Statistic	Level		Diffrence	
	$GPB^*_{it}$	$D^*_{it}$	$GPB^*_{it}$	$D^*_{it}$
LLC	<b>-4.87721</b> (0.0000)	<b>7.64728</b> (1.0000)	<b>-13.2524</b> (0.0000)	<b>-10.8591</b> (0.0000)
Breitung	<b>-2.53829</b> (0.0056)	<b>3.96478</b> (1.0000)	<b>-7.13744</b> (0.0000)	<b>-4.61471</b> (0.0000)
IPS	<b>-5.90350</b> (0.0000)	<b>7.34697</b> (1.0000)	<b>-17.2667</b> (0.0000)	<b>-11.4114</b> (0.0000)
Fisher	<b>-8.40422</b> (0.0000)	<b>6.83435</b> (1.0000)	<b>-20.1944</b> (0.0000)	<b>-16.2673</b> (0.0000)

Numbers in parenthesis are p-values.

Table 2 shows the Panel Unit Root Tests results. For the ratio of debt to potential GDP,  $D^*_{it}$ , we have unanimity since all the tests we conduct below do not have statistically significant evidence to reject the null hypothesis, and therefore it is non-stationary; that is, the solvency condition is not met for these economies. On this explanatory variable, after applying the first difference, we found evidence of stationarity. It is integrated of order one, i.e., I(1). However, all panel unit root tests indicated that our dependent variable,  $GPB^*_{it}$  is stationary, i.e., I(0). Therefore, since the variables are not of the same order of integration, conventional panel cointegration tests cannot be applied. Based on this, we moved forward with the panel ARDL methodology.

**Table 3. Panel ARDL results.**

	PMG		MG		DFE	
<i>Long-run coefficients</i>	<i>Coef.</i>	<i>Std. Error</i>	<i>Coef.</i>	<i>Std. Error</i>	<i>Coef.</i>	<i>Std. Error</i>
$D^*_{it}$	.0421601***	.0226325	.1488496**	.0705053	.043575**	.0181212
<i>Error-correction coefficient</i>	-0.5432801*	.052175	-0.5701856*	.0622031	- 0.7438724***	.039596
$\Delta D^*_{it}$	.0577792*	.0187795	.0883506*	.0289822	.0696985***	.0087944
<i>Intercept</i>	-.7959278*	.2229216	-.6480272*	.2453039	-1.200621***	.2222478
<i>Observations</i>	600		600		600	
<i>Hausman Test</i>			<i>p= 0.1101 (i)</i>		<i>p=0.9168 (ii)</i>	

Note: \*\*\* indicate significance at 1%, \*\* at 5% and \* at 10% (i) Under the null hypothesis, PMG is more efficient estimation than MG. (ii) PMG is more efficient estimation than DFE under the null hypothesis.

Results of the ARDL panel model estimated by using PMG, MG, and DFE approaches to test the sustainability of debt-to-GDP ratio with respect to the government primary balance are reported in Table 3. A Hausman test was performed in order to choose the appropriate model to be estimated.

The short-run results show that all three estimation methods yield positive and statistically significant coefficients of the debt-to-GDP ratio affecting the government primary balance. Whereas the PMG and MG models are significant only at the 10% level, the DFE model gives strong significance even at the 1% level. In the long run, the models consistently indicate a positive relationship between the debt-to-GDP ratio and the primary balance, reinforcing the notion of long-run fiscal sustainability.

These results are supported by the Hausman test, which cannot reject the null of homogeneity in the long-run coefficient of the debt-to-GDP ratio and, therefore, assert that the PMG model is more efficient than the MG model. Comparing the PMG model with the DFE model, the PMG model also outperforms, being more efficient and preferred. Hence, we will be basing most of our interpretations on the PMG results.

These positive and statistically significant long-run coefficients on the debt-to-GDP ratio suggest that fiscal authorities in Indian states systematically change the primary balance in response to rising public debt in order to ensure fiscal sustainability. From the PMG model, it can be noticed that for each one percent increase in the debt-to-GDP ratio, the primary balance improves by approximately 0.04 percent, reflecting responsible fiscal behavior across Indian states.

The error correction model for the short run further supports the sustainability of fiscal policies. In this respect, the value of ECM, which is -0.5433 is negative and statistically significant, and it implies that

about 54.33% of any deviation from the long-run equilibrium between debt and primary balance are corrected in each period. The speed with which the adjustment takes place points out the dynamic nature of fiscal sustainability, whereby the fiscal imbalances are mopped up quickly to attain stability over time. The fact that the ECM is significant implies that the Indian states are actively managing their fiscal policies to correct for short-run imbalances in a manner consistent with their long-run fiscal objectives. This would imply a stable long-run relationship between debt and the primary balance, thereby supporting the hypothesis of long-run fiscal sustainability in Indian states.

Overall, we can say that our results show that Indian states are both short-run and long-run fiscally sustainable. This positive and statistically significant relationship of the debt-to-GDP ratio with the government primary balance suggests that states actively use fiscal policy adjustment in response to rising debt, especially in the long run. This evidence is further supported by the results of the ECM, which show that short-run fiscal imbalances are rapidly corrected and a stable fiscal environment exists. In other words, the estimates indicate that Indian states are on a sustainable fiscal path—that is, short-term flexibility as well as long-term stability prevails in the adjustments of public debt and primary balances.

### 7.3. Panel Granger Causality Based on the Dumitrescu and Hurlin Test

**Table 5. Dumitrescu and Hurlin panel causality test in heterogeneous panels.**

<b>H0: Debt Does not Granger Cause Primary Balance</b>			
	<b>AIC (k = 5)</b>	<b>HQIC (k = 2)</b>	<b>SC (k = 2)</b>
<b>W-Stat</b>	<b>10.2158</b>	<b>6.4035</b>	<b>6.4035</b>
<b>Z bar-Stat</b>	<b>7.3763</b>	<b>9.8465</b>	<b>9.8465</b>
<b>Prob.</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>
<b>H0: Primary Balance Does Not Granger Cause Debt</b>			
	<b>AIC (k = 5)</b>	<b>HQIC (k = 2)</b>	<b>SC (k = 2)</b>
<b>W-Stat</b>	<b>5.4575</b>	<b>2.4369</b>	<b>2.4369</b>
<b>Z bar-Stat</b>	<b>0.6470</b>	<b>0.9769</b>	<b>0.9769</b>
<b>Prob.</b>	<b>0.8006</b>	<b>0.3286</b>	<b>0.3286</b>

The results of the Dumitrescu and Hurlin 2012 panel Granger causality test are represented in Table 5, where the effect of causality is verified between debt and government primary balance. The obtained results clearly indicate that there is unidirectional causality from debt to the government primary balance.

In particular, the hypothesis that "debt does not Granger cause the government primary balance" is strongly rejected by all criteria and lag lengths. The estimates of the Wald and Z-bar statistics are significant; for the AIC, HQIC, and SC criteria, the probability values are 0.0000; hence, debt significantly Granger-causes the government primary balance. This would imply that changes in the

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level of debt have a statistically significant effect on the primary balance, hence the importance of debt management in fiscal policy.

On the other hand, the null hypothesis of "the primary balance does not Granger cause debt" is not rejected at any of the information criteria and at any of the lag lengths. The probability values are outstandingly high-0.8006 for AIC, 0.3286 for HQIC, and 0.3286 for SC-while the Wald and Z-bar statistics are relatively low. This suggests that changes in the primary balance are not highly associated with changes in the level of debt. Thus, alterations in the primary balance are not a determining factor for changes in debt.

On the whole, the findings indicate that there is unidirectional causality from debt to the government primary balance. In other words, to a great extent, the level of debt determines the primary balance, while the level of the primary balance does not influence debt to that great an extent. This result points toward the imperative of debt management in fiscal policy and fiscal stability, considering the vital role played by changes in the level of debt in determining the government's primary balance.

**8. Conclusion:**

This paper investigates fiscal sustainability for 20 major Indian states during the period from 1991 to 2021 using the Panel Autoregressive Distributed Lag model to assess both the short-run and long-run fiscal sustainability. The results of the panel unit root tests are that the variables of debt-to-potential GSDP ratio and government primary balance-to-potential GSDP ratio do not share the same order of integration. While the null of non-stationarity is not rejected for debt, it is rejected for the primary balance. The latter was deduced by following a panel ARDL procedure instead of a conventional panel cointegration one. This methodology is especially well-suited to the study in as much as it allows series that are integrated of different orders, thus providing an accurate framework through which to analyze fiscal sustainability.

The standard static panel models, like pooled OLS, fixed effects, or random effects, do not allow the possibility of distinguishing between the short- and long-run relationships among the variables. On the other hand, GMM is more concentrated on the short-run dynamics. For these reasons, the panel ARDL technique seems a very successful method to get over these drawbacks. Furthermore, the major advantage of such a methodology is that it can be implemented even when the order of integration is different for the two sets of variables, which is our case. In this study, we particularly estimate the following three alternative estimators: the Mean Group estimator, the Pooled Mean Group estimator, and the Dynamic Fixed Effects estimator. Applying the Hausman test, it is seen that PMG outperforms the best on consistency and efficiency grounds.

According to the PMG, our results provide empirical evidence of fiscal sustainability for Indian states in the short term as well as the long run. These positive and statistically significant long run and short run coefficients on the debt-to-GDP ratio suggest that fiscal authorities in Indian states systematically change the primary balance in response to rising public debt in order to ensure fiscal sustainability. From the PMG model, it is observed that for each one percent increase in the debt-to-GDP ratio, the primary balance increases by approximately 0.04 percent, indicating responsible fiscal behavior on the part of Indian states.

The error correction model in the short run further supports the sustainability of fiscal policies. In this respect, the value of ECM, which is -0.5433, is negative and statistically significant; it implies that about 54.33% of any deviation from the long-run equilibrium between debt and primary balance are corrected in each period. The speed at which adjustment takes place points out the dynamic nature

of fiscal sustainability whereby fiscal imbalances are mopped up quickly to attain stability over time. Finally, confirmation of unidirectional causality from debt to the government primary balance is obtained through the Dumitrescu and Hurlin panel Granger causality test. This result is important since it points to effective debt management; a rising debt has a substantial effect on the primary balance, whereas changes in the latter have little direct effect on the levels of debt.

These findings, therefore, bring out the critical issue of fiscal sustainability at the state level. In fact, as India marches toward becoming a developed nation by 2047, there is an emergent need for stability in the fiscal ecosystem to support inclusive long-term growth. This proactive effort by the Indian states, in managing their debt and adjusting fiscal policies accordingly, has been ensuring that Indian states remain on a sustainable fiscal path and contribute to the broader national vision.

Overall we can say that empirical evidence presented in this study is suggestive of the fact that the Indian states are both in the short and long runs fiscally sustainable. This is a very important sustainable fiscal path to attain the ambitious development goals put forth by India-to make sure that state and national governments are adequately positioned to meet future challenges. In fact, India wants to become a *Viksit Bharat* by 2047, so fiscal sustainability at the state level would be one of the cornerstones of achieving this vision.

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