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THE LONG-TERM RELATIONSHIP BETWEEN FISCAL DEFICIT AND ECONOMIC GROWTH IN INDIA

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Abstract
This study investigates the long-term link between fiscal deficit and economic growth in the Indian economy, employing annual time-series data from 1991 to 2024, obtained from the Handbook of Statistics on the Indian Economy published by the Reserve Bank of India (RBI). The Augmented Dickey–Fuller (ADF) unit root test is utilized to evaluate the stationarity of the variables. The Autoregressive Distributed Lag (ARDL) bounds testing method is also used to figure out the long-term relationship because the variables have different orders of integration. The empirical data demonstrates that fiscal deficits have a long-term adverse and statistically significant effect on economic growth, indicating that enduring fiscal imbalances may impede India's potential for sustainable economic progress. The findings of this study include significant policy ramifications for macroeconomic stability and fiscal discipline within the Indian economy.

Keywords: ARDL Model, Unit Root Test, India, Time Series Analysis, and RBI Data for the Fiscal Deficit and Economic Growth

I. Introduction

The relationship between fiscal deficit and economic growth is one of the most controversial issues in macroeconomic policy, especially in emerging countries like India. Fiscal deficits are sometimes seen as a way to encourage growth when the economy is not growing, but long-term fiscal imbalances make people wonder about the sustainability of debt, macroeconomic stability, and long-term growth prospects. In the Indian context, this topic has taken on new importance since the COVID-19 pandemic, which needed unprecedented fiscal expansion and a temporary loosening of fiscal rules under the Fiscal Responsibility and Budget Management (FRBM) Act.

India's fiscal situation is affected by global economic shocks, rigid structures in governmental spending, changes in the economy over time, and local policy agendas. Even if counter-cyclical fiscal policy is necessary to keep output constant during recessions, big fiscal deficits that are not well-targeted might eventually make private investment less appealing, raise interest rates, and lower growth potential. So, the problem for policymakers is how to balance the need for short-term growth with the need for long-term budgetary stability.

India has consistently posted substantial fiscal deficits over the past fifty years. Over this time, capital spending as a share of GDP and development spending as a share of total government spending have both gone down. On the other hand, charges that do not help development and are not very effective, such interest payments, subsidies, and administrative costs, have gone up a lot. This changing pattern of public spending raises questions about the quality of fiscal deficits and their ability to promote long-term economic growth.

These problems are considerably more important now that COVID is over. The Indian government exploited the FRBM Act's escape provision, which lets budget deficits go above the prescribed limitations, to decrease the pandemic's bad effects on the economy. This flexibility was important for the economy to get back on track, but it has also led to more debate about whether long-term growth and fiscal prudence could be at risk if fiscal expansion continues. Consequently, it is imperative for scholars and policymakers to grasp the growth ramifications of fiscal deficits in this novel fiscal context.

The empirical investigation on the correlation between fiscal deficit and economic growth has been undertaken in both developed and developing countries; yet, the findings remain inconclusive. Adam and Bevan (2005) say that the effects of fiscal deficits on growth depend on how the government pays for things, how much debt it has, and how it spends its money. Deficits financed through excessive borrowing or inequitable taxation may inhibit productive investment and impede private sector growth. A number of studies, including Keho (2010), Nelson and Singh (1994), Avila (2011), Taylor et al. (2012), Osinubi et al. (2010), Dalyop (2010), Cebula (1995), Fatima et al. (2011), Brender and Drazen (2008), and Ghali (1997), have examined the effects of fiscal deficits on economic growth, inflation, and investment in OECD countries, African economies, and other developing regions.

Nonetheless, the empirical data pertaining to India remains limited and conflicting. Although research such as Gupta et al. (2005) has investigated the relationship between public expenditure and economic growth in emerging economies, there is a scarcity of analyses explicitly targeting India that utilize contemporary data to evaluate both the immediate and prolonged effects of fiscal deficits on economic growth. Additionally, current research predominantly neglects the post-FRBM fiscal framework, the function of institutional fiscal regulations, and the implications of the FRBM Act's flexibility provision in the post-COVID era. This constitutes a notable deficiency in the literature.

To address these gaps, this research empirically examines the impact of India's budget deficit on economic growth within a contemporary institutional and macroeconomic context. This study makes three main contributions. First, it fully integrates the post-COVID fiscal landscape and assesses the growth ramifications of fiscal expansion under the FRBM Act's flexibility clause, a dimension that has not been extensively investigated in previous empirical studies. Second, the paper examines both long-term and short-term dynamics utilizing the Autoregressive Distributed Lag (ARDL) bounds testing methodology and the corresponding Error Correction Model (ECM), which are appropriate for small samples and varying orders of integration. Third, the analysis utilizes annual time-series data from 1990–91 to 2019–20, offering contemporary and policy-relevant findings.

In order to close these gaps, this paper empirically investigates how India's budget deficit affects economic growth within a modern institutional and macroeconomic framework. The key contributions of this study are threefold. **First,** it explicitly incorporates the post-COVID fiscal environment and evaluates the growth implications of fiscal expansion under the FRBM Act's flexibility clause an aspect that has not been systematically explored in prior empirical work. **Second,** the study analyses both long-run and short-run dynamics using the Autoregressive Distributed Lag (ARDL) bounds testing approach and the associated Error Correction Model (ECM), which are suitable for small samples and mixed orders of integration.

Third, by employing annual time-series data for the period 1990–91 to 2019–20, the study provides updated and policy-relevant evidence.

This paper contributes to the broader discourse on fiscal sustainability, countercyclical policy formulation, and institutional fiscal regulations in emerging economies by delivering a comprehensive examination of the relationship between fiscal deficit and economic growth in India. Policymakers are expected to derive significant lessons from the findings in the post-pandemic period while formulating growth-oriented yet financially prudent strategies.

Theoretical Relationship between Fiscal Deficit and Economic Growth: Evidence and Policy Implications for India

In macroeconomic policy, the link between fiscal deficits and economic growth is still a big worry, especially for developing countries like India. Fiscal deficits, characterized by government expenditures surpassing revenues, can impact growth dynamics in several ways, with results shaped by the efficiency of public spending, the sustainability of debt, and the quality of institutions. India's recent experience with fiscal austerity, structural reforms, and great economic performance provides a vital empirical foundation for re-evaluating this theoretical connection.

Theoretical Frameworks

The **Ricardian equivalence theory** posits that enduring fiscal deficits do not influence aggregate demand or long-term growth, as rational agents internalize the government's budget limitation and augment private savings in anticipation of forthcoming tax obligations. From this viewpoint, impairments do not influence output (Barro, 1974). However, Ricardian equivalence is probably not very strong in India, where households have trouble getting cash and the capital markets are not perfect. Borrowing to cover deficits could affect economic activity.

In **traditional neoclassical models**, when the government borrows money, it makes more people want to borrow money, which raises interest rates and makes it harder for businesses to invest. In India, a lot of public debt could make the possible benefits of fiscal expansion less likely by raising interest rates and making it less likely that private capital will be created. When deficits are financed through debt instead of productive investment, empirical analyses of Indian states reveal a negative association between gross fiscal deficits and economic growth, hence reinforcing the crowding-out effect at subnational tiers.

Keynesian theory posits that in times of economic downturns; fiscal deficits bolster aggregate demand via government expenditure and tax alleviation. India's countercyclical fiscal strategy helped investment and consumption during recessions like the years after the epidemic. The long-term impacts depend on how well the government can keep its budget balanced, but targeted spending on social safety nets and rural employment programs helped keep things stable.

According to **endogenous growth theory**, deficits can help the economy grow if they are used to pay for investments that increase the economy's productive capacity, such infrastructure, education, and technology. This fits with India's government focus on spending on capital. Recent budget forecasts say that capital expenditures will keep going up quickly, with fiscal consolidation aimed at 4.3–4.5% of GDP in FY27. This kind of public investment can also boost total factor productivity, in addition to supporting long-term growth paths that are in line with endogenous growth mechanisms.

From **a structuralist point of view**, deficits can make it easier to make big changes in infrastructure, industry, and social sectors. In India, changes to the GST and improvements to infrastructure have been very important for making local markets bigger and more competitive. Also, giving money on purpose to digital public infrastructure shows how public spending can lead to structural transformation.

India's Recent Macroeconomic Context

Even if India is having trouble with its finances, international organizations give a complicated image of the country's economic potential. The IMF has boosted its projection for India's GDP growth to 7.3% for FY26. This is because the economy is doing well and domestic demand is strong. The World Bank thinks that in FY26, the economy will rise by roughly 7.2%. India is also trying to reduce its fiscal consolidation. It wants its fiscal deficit to be between 4.3–4.5% of GDP in FY27 while still spending a lot on capital projects. The IMF Article IV evaluations recognize these efforts, but they also point out the trade-off between growth and consolidation and recommend continuing to raise taxes and spend money wisely to strengthen fiscal buffers. India's total government debt is still large, but steady development and good fiscal management should help bring it down. IMF consultations underscore the need for continued structural adjustments, like better tax administration and more efficient public investment, to keep the economy stable and growing. The policy mix stresses a well-planned approach that balances spending that boosts growth with cutting the deficit in order to keep India's target of consistent 7-8% GDP growth.

The theoretical literature posits that the economic growth effects of fiscal deficits are uncertain and dependent on the characteristics of deficit financing and expenditure composition:

In situations with deep capital markets, households may not feel the consequences of future tax burdens (Ricardian equivalence) or may only feel them weakly. But there are bad repercussions when deficits push out private investment or show that expenditure is not very productive. Also, there are good benefits when deficit funding helps with counter-cyclical stabilization or investment in productive and structural change.

Empirical evidence and institutional forecasts indicate that disciplined fiscal frameworks in India might capitalize on the growth potential of fiscal deficits without jeopardizing macroeconomic stability, provided they are complemented by strategic investments in infrastructure and human resources. The connection between India's budget deficits and economic growth is a mix of different theories and real-world policy choices that do not always agree with each other. Well-planned public investment funded by deficits can increase productive capacity and keep expansion going, but too many deficits can make it harder for private investors to spend by crowding them out. Recent predictions from the IMF and World Bank say that India's commitment to structural reforms, strategic capital spending, and fiscal consolidation is still important for achieving long-term and fair growth.

Economic Output and Capital Formation: Evidence from India's Capital Expenditure Push

The connection between capital formation and economic production is a key idea in growth economics. In India, where the government is still focused on public capital spending, this idea has taken on new meaning. When gross fixed capital formation (GFCF) increases the amount of physical assets like machinery, infrastructure, and technology, it makes it easier for an economy to produce things. The huge rise in public capital investment since the epidemic has been one of the key reasons why India's economy has grown in the medium to long term.

India's CapEx-led growth plan focuses on building up infrastructure for power, transportation, logistics, digital connection, and urban development. These investments increase labor productivity by making industrial processes more efficient and reducing supply-side constraints. The IMF (2023) says that investing in public infrastructure can lead to big output multipliers in developing market economies like India, especially where there is extra capacity and private investment is encouraged. This is in line with India's experience, where state capital spending has "packed in" private investment instead of pushing it out.

The World Bank (2024) says that India's infrastructure drive decreases transaction costs, promotes market integration, and strengthens regional connectivity. All of these things lead to long-term productivity improvements as well as short-term output increases. Better ports, highways, freight corridors, and digital public infrastructure have made it easier for enterprises to get to markets and cut logistical costs. This has made the link between capital creation and economic production stronger.

Additionally, the composition of capital formation has grown in significance. By increasing total factor productivity, India's increasing investment in robust and productive infrastructure as opposed to revenue expenditure supports endogenous growth mechanisms. According to IMF assessments, strong growth may be sustained while preserving macroeconomic stability if continued capital accumulation is paired with institutional reforms and budgetary restraint. Therefore, in the Indian context, capital formation serves as a crucial conduit via which fiscal policy affects structural change and economic production.

The paper is divided into **five sections** to organize the inquiry. The study's background, the theoretical connections between fiscal deficit and economic growth, pertinent empirical data and policy implications for India, the country's recent macroeconomic context, and the relationship between economic growth and capital formation with special reference to India's capital expenditure push, are all covered in **Section I**, as previously mentioned. The data sources, variable definitions, and econometric methods used are detailed in **Section II**. The empirical results and discussion are presented in **Section III**. **Section IV** concludes the study by summarizing the key insights and proposing policy recommendations based on the empirical evidence. In order to guide future policy orientations, the study aims to provide a more comprehensive understanding of the relationships between fiscal deficit and economic growth in India. **Lastly,** because the analysis is based only on aggregate annual time-series data, the study admits its **limitations**.

II. Data and Methodology

Data Sources and Variable Definition

This study utilizes annual time-series data spanning from 1991-1992 to 2023-2024 and relies exclusively on secondary sources. During this time, the Indian economy went through a lot of important structural changes, like the recent growth strategy based on capital spending, periods of fiscal austerity, and reforms after liberalization. Most of the time, data comes from the Reserve Bank of India's (RBI) Handbook of Statistics on the Indian Economy to make sure it is accurate and reliable. The Ministry of Statistics and Programme Implementation (MoSPI) just released the most recent national accounts series. It says that all variables are presented in real terms at prices that stayed the same from 2011 to 2012. The GDP deflator is used to get rid of the effects of inflation and keep comparisons over time consistent.

Real Gross Domestic Product (GDP) at market prices is a good way to measure economic production since it uses modern national accounting procedures and gives a full picture of all economic activities. Gross Domestic Capital Formation (GDCF) is a measure of investments in physical assets like machinery, equipment, and infrastructure. It is expressed as a percentage of GDP. The fiscal deficit (FD) illustrates the government's borrowing needs and financial situation when it is shown as a percentage of GDP.

Econometric Framework

The research employs the Autoregressive Distributed Lag (ARDL) bounds testing methodology for cointegration, as proposed by Pesaran, Shin, and Smith (2001), to analyze the short-term and long-term relationships among economic output, fiscal deficit, and capital formation. The ARDL methodology is particularly appropriate for the present research due to several methodological considerations. The ARDL framework facilitates the estimation of long-run connections regardless of whether the underlying variables are integrated of order I(0)

or **I(1)**, as long as none are integrated of order **I(2)**. The time-series characteristics of the variables are analyzed by Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests to verify adherence to the ARDL prerequisites.

The ARDL technique is appropriate for small and finite sample sizes, providing unbiased and efficient long-run estimates despite probable endogeneity across regressors. The limits testing approach is utilized to evaluate the presence of a stable long-term cointegrating relationship among the variables.

After establishing cointegration, the long-run coefficients are computed in conjunction with the error correction model, which reflects short-run dynamics and the rate of adjustment towards long-run equilibrium. The statistical significance and direction of the error correction term (ECT) indicate convergence to the long-term trajectory after short-term disturbances.

Diagnostic and Stability Tests

A comprehensive array of post-estimation diagnostic testing is conducted to ensure the resilience and reliability of the estimated ARDL model. The tests encompass the Jarque–Bera test for residual normality, the Breusch–Pagan test for heteroskedasticity, the Breusch–Godfrey LM test for serial correlation, and the Ramsey RESET test for functional form misspecification. Furthermore, the CUSUM and CUSUM of Squares (CUSUMSQ) tests are employed to evaluate parameter stability during the sample period.

Model Specification

Based on theoretical considerations and empirical literature, the following functional relationship is specified:

$$\boldsymbol{GDP_t = f(GDCF_t, FD_t)}\text{x}$$

Which can be expressed econometrically as:

$$\boldsymbol{GDP_t = \alpha_0 + \alpha_1 GDCF_t + \alpha_2 FD_t + \varepsilon_t}\text{x}$$

Where:

GDP_t denotes real gross domestic product (economic output), $GDCF_t$ represents gross domestic capital formation as a percentage of GDP, FD_t denotes fiscal deficit as a percentage of GDP, and ε_t is the stochastic error term.

The coefficient of capital formation (α_1), which represents the contribution of investment to increasing productive capacity and output, should be positive. Theoretically, however, the effect of the budget deficit (α_2) is still unclear. Deficit-financed productive spending, especially in infrastructure, can boost economic activity, but large deficits may discourage private investment and raise debt servicing costs. Thus, in the macroeconomic context of India, the overall impact of fiscal deficit on economic growth is evaluated empirically.

III. Results and Discussion: The empirical findings and Discussion are discussed below:

Unit Root Test Results

To prevent spurious regression results, the time-series characteristics of the variables were evaluated before looking at the long-term and short-term correlations between economic growth, fiscal deficit, and capital formation. **Table 1** presents the results of applying the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests on annual data from 1991 to 2024.

The empirical results show that the variables have different integration orders. In particular, it is discovered that the log of the gross domestic product (LGDP) and the log of the gross fiscal deficit (LGFD) are non-stationary in levels but stable after first differencing, suggesting that both series are integrated of order one, **I(1)**. When the series are initially differenced, the null hypothesis of a unit root is definitively rejected at conventional significance levels, confirming their stochastic trend behaviour across the research period, but it cannot be rejected at levels in specifications without intercepts.

On the other hand, it is discovered that the log of gross capital formation (LGCF) is stationary at level, signifying integration of order zero, **I(0).** Under alternate deterministic specifications, the null hypothesis of non-stationarity is rejected by both ADF and PP test statistics at the 5% level or higher. This implies that over the sample period, capital production in India does not follow a sustained stochastic trend and instead displays mean-reverting behaviour.

Overall, none of the series is integrated of order two, **I(2)**, and the unit root test findings verify that the variables are either level-stationary or first-difference stationary. This result meets the prerequisite for using the Autoregressive Distributed Lag (ARDL) bounds testing method for cointegration. The adoption of the ARDL methodology in the ensuing analysis is strongly supported empirically by the existence of mixed integration orders, **I(0)** for LGCF and **I(1)** for LGDP and LGFD.

Table 1: Unit Root Results for variables of central government in India (1991-2024)

Variables (Overall Period)	**ADF Test (t-statistics)**			**Phillips-Perron Test (Adjusted t-statistics)**			**Order of Integration**
	Without intercept	With intercept	With intercept and trend	Without intercept	With intercept	With intercept and trend	
LGDP	-0.837126#	-4.394083*	-4.541951*	-0.662660#	-4.409295*	-4.647826*	I(1)
LGCF	-1.467649	-4.635963	-4.658115	-2.474305**	-4.720977	-4.655702	I(0)
LGFD	-4.937311*	-6.313072*	-5.929487*	-4.673289*	-6.159175*	-6.142983*	I(1)

*1% level of significance. Indicates rejection of H0 Non-Stationary (ADF) & (P-P) at 1%
** 5% level of significance. Indicates rejection of H0 Non-Stationary (ADF) & (P-P) at 5%
*** 10% level of significance. Indicates rejection of H0 Non-Stationary (ADF) & (P-P) at 10%
# statistically insignificant
LGDP= Log of Gross domestic product at factor cost
LGCF= Log of Gross capital formation
LGFD= Log of Gross fiscal deficit

Bounds Testing Approach to Cointegration Results (1991–2024)

Using the ARDL bounds testing approach to cointegration, the existence of a long-run equilibrium link between economic growth, fiscal deficit, and capital formation is investigated. The results of the bounds test are reported in **Table 2**. At the 10% (4.75), 5% (5.29), and 1% (6.14) significance levels, the calculated F-statistic of 12.885 significantly above the upper bound critical values. This shows that the null hypothesis—that there is no long-term cointegration between the variables—is categorically rejected. Strong statistical evidence for a stable and robust long-run association is provided by the F-statistic's size, which is more than double the upper bound at the 1% level.

The high level of statistical significance demonstrates that changes in the fiscal deficit and capital formation together account for long-term changes in economic output during the study

period. Crucially, the cointegration result holds true under an unrestricted intercept and unrestricted trend specification, indicating that the long-term association endures despite structural changes in the Indian economy during the post-liberalization era and is not susceptible to deterministic components. The presence of cointegration implies that deviations from long-run equilibrium are temporary and that the variables adjust toward equilibrium following short-run shocks. This empirical finding provides a sound basis for estimating long-run coefficients and short-run dynamics within an error correction framework, thereby enabling meaningful policy inference.

Table 2: Result of bound test

ARDL Model: LGDPF = *f* (LFISD, LGDCF)		
Time period	Maximum lag	F-statistics
Whole period (1991-2022)	4	12.88544
Critical values	Lower Bound I(0)	Upper Bound I(1)
10% level	3.47	4.75
5% level	4.01	5.29
1% level	5.17	6.14

Note: Unrestricted intercept and Unrestricted trend, Asymptotic Critical Value Bounds for F-Statistics by Pesaran et al. (2001)
* and ** denote one and 5% level of significance

Table 3 reports the estimated long-run coefficients obtained from the ARDL (1,4,2,0) model, selected on the basis of the Schwarz Bayesian Criterion (SBC), with LGDPF as the dependent variable. The results provide important insights into the long-run growth effects of fiscal deficit and capital formation in India.

Impact of Fiscal Deficit

At the 1% level, the calculated coefficient of the fiscal deficit (LFD) is statistically significant and negative. In particular, ceteris paribus, a one-unit rise in the fiscal deficit is linked to a roughly 0.041 percent decrease in real GDP. This result offers compelling empirical evidence that long-term economic output is negatively impacted by persistent budget imbalances. The magnitude of the coefficient implies that while the growth-reducing impact of fiscal deficit is moderate, it is economically important and statistically robust, indicating that chronic deficits may crowd out productive investment or create debt-servicing obligations that constrain growth.

Role of Capital Formation

There is no immediate long-term impact of current-period investment on economic output, according to the contemporaneous coefficient of gross domestic capital formation (LGCF), which is positive but statistically negligible. The lagged coefficients of capital formation, however, show a more complex dynamic relationship. In particular, there is a negative and statistically significant coefficient of LGCF lagged by three periods [LGCF(−3)] and a positive and highly significant coefficient of LGCF lagged by four periods [LGCF(−4)]. These findings suggest that capital formation has a non-linear and time-dependent growth impact in India. Gestation delays, adjustment expenses, or inefficient capital use during the early stages of investment could be the cause of the negative coefficient at the third lag. On the other hand,

the positive and substantial coefficient at the fourth lag indicates that after projects mature and are fully operational, capital investments start to produce productivity improvements and positively impact economic growth.

Overall, these findings imply that capital formation influences economic growth with long gestation periods, reinforcing the importance of investment quality and implementation efficiency rather than short-term expenditure increases.

Deterministic Components

The trend coefficient is positive and statistically significant, demonstrating a consistent underlying growth trajectory in India's economy over the research period. Additionally important is the constant term, which captures baseline growth effects that the included regressors are unable to explain.

Model Diagnostics and Stability

A wide range of stability and diagnostic tests corroborate the anticipated long-run coefficients' dependability. Since all test statistics are unable to reject their respective null hypotheses at standard significance levels, residual diagnostics verify the lack of serial correlation, heteroskedasticity, and non-normality. There is no indication of functional form misspecification according to the Ramsey RESET test. Additionally, parameter stability and the lack of structural instability are confirmed by the CUSUM and CUSUM of Squares tests, which stay within the 5% critical bounds throughout the sample time. These findings support trustworthy long-term inference and confirm the estimated model's robustness. Finally:

The long-term negative effects of fiscal deficit on economic production are statistically significant. Growth is impacted by capital formation with notable time lags, emphasizing gestation effects. While mature investments increase output, short-term investments might not result in growth right away. Tests for stability and diagnostics verify the suitability and dependability of the model.

Table 3: Estimated long-run coefficient (1991-2024)

Dependent variable is LGDPF ARDL (1,4,2,0) selected based on Schwarz Bayesian Criterion			
Regressor	Coefficient	Standard Error	T-Ratio [Prob]
LFD	-0.041396	0.005833	-4.606534[0.0003]
LGCF	0.040394	0.036476	0.857949[0.4036]
LGCF (-3)	-0.132144	0.023413	-3.017977[0.0082]
LGCF (-4)	0.134232	0.032797	4.966869[0.0001]
Constant(C)	5.554353	1.545256	3.589742[0.0025]
Trend	0.016287	0.071041	2.938055[0.0096]

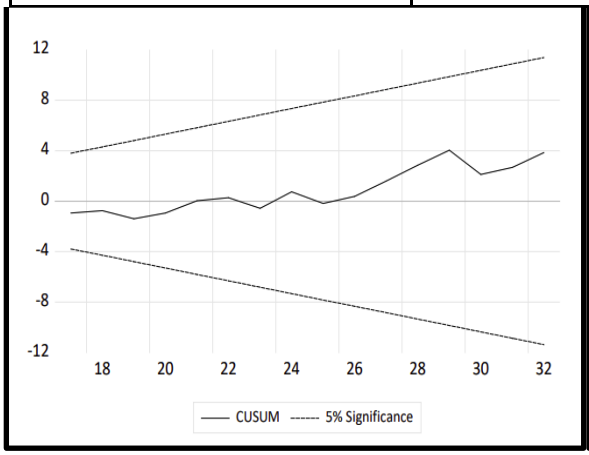
[ ] shows p-value

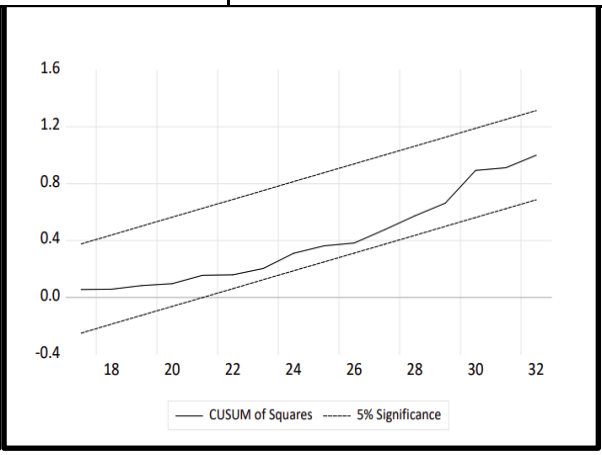
Note *, ** and *** denote 1, 5, and 10% level of significance respectively

Diagnostic test and Stability test:

Residual Diagnostics	**Q Statistics**	All p-values are greater than 0.05, therefore no significance of

		autocorrelation or partial autocorrelation in the model.
	Histogram Normality Test	Jarque-Bera 0.491231[0.782223]
	Serial Correlation	F-statistic: 1.462812[0.2737]
	ARCH Test	F-statistic: 0.858379[0.3631]
Stability Diagnostics	**Ramsey RESET Test**	t-statistic: 0.791022[0.4413] F-statistic: 0.625715[0.4413] Likelihood ratio:1.144298[0.2847]
	CUSUM Test	Critical values are not exceeded the bounds of 5% level of significance. Hence the results reported are valid for reliable interpretation (Fig)
	CUSUM Squares Test	Critical values are not exceeded the bounds of 5% level of significance. Hence the results reported are valid for reliable interpretation (Fig)





[ ] shows p-value, left figure CUSUM Test and right figure CUSUM Squares Test.

Discussion

The empirical results provide robust evidence of a sustained relationship among India's budget deficit, capital formation, and economic growth from 1991 to 2024. The ARDL long-run estimates show that the fiscal deficit has a statistically significant negative effect on economic growth. On the other hand, the effect of capital formation is dynamic and depends on the time

it takes for investments to pay off, which shows that there are periods of time when investments lead to growth.

The negative coefficient of the fiscal deficit supports the neoclassical crowding-out hypothesis. This means that long-term growth may be slowed by persistent fiscal imbalances that raise borrowing costs, discourage private investment, and increase debt-servicing liabilities. This outcome is particularly relevant in the Indian context, considering the persistent income deficits and the growing debt burden on governmental finances. The result aligns with prior Indian studies indicating that fiscal deficits adversely affect growth when predominantly fueled by consumption rather than investment (Bhaduri & Mohan, 2014; Bose et al., 2007). Cross-country data from emerging economies show that large and ongoing budget deficits hurt long-term growth (IMF, 2023; World Bank, 2024).

In contrast, the function of capital formation exhibits non-linear and deferred effects. The fact that capital formation is very low right now means that investing does not immediately lead to more production. The significant negative coefficient at the third lag and the strong positive coefficient at the fourth lag show that there are delays in implementation, costs of making changes, and effects of learning that come with large-scale spending. This pattern is consistent with endogenous growth theory and empirical data from nations that depend significantly on infrastructure, wherein returns on investment materialize only after projects attain operational maturity. Similar delayed investment effects have been observed in other developing economies (Calderón & Servén, 2014) and in India (Dash & Sahoo, 2010).

The significant positive trend term supports the idea that the Indian economy is growing because of structural reforms, demographic advantages, and productivity gains. However, the results show that this growth path can be weakened by long-term fiscal imbalances if they do not lead to effective capital formation.

IV. Conclusion and Policy Suggestions

The estimated coefficient of fiscal deficit suggests that, when all other variables are held constant, a one percent rise in the fiscal deficit eventually results in a real GDP drop of about 0.04%. Even while the elasticity seems low, considering the ongoing fiscal deficits, its cumulative impact over time is substantial from an economic standpoint. This implies that even modest gains in budgetary restraint can result in significant dividends for long-term growth.

According to the lagged coefficients of capital creation, it takes around four years for investment returns to materialize. Investment projects positively contribute to output growth once they mature, as indicated by the positive elasticity at the fourth lag. The necessity for a medium- to long-term evaluation framework for capital spending is highlighted by the possibility that short-term evaluations of public investment may understate its actual growth impact. This study uses annual data from 1991–2024 within an ARDL framework to empirically investigate the short- and long-term relationships between India's fiscal deficit, capital formation, and economic growth. The findings offer solid proof of a consistent, long-term cointegrating link between the variables. While capital formation promotes growth through delayed but positive effects that represent gestation and productivity realization mechanisms, fiscal deficit is demonstrated to have a statistically significant negative impact on long-term economic growth.

The dynamics of error correction verify that short-term shocks cause the economy to correct toward equilibrium and that long-term equilibrium deviations are transient. The consistency of these results is confirmed by robustness tests using different estimators. All things considered, the results show a strong and statistically significant long-term correlation between fiscal deficit and economic growth, demonstrating that ongoing fiscal imbalances can significantly impede India's economic progress by discouraging private investment and driving up

borrowing rates. Crucially, the findings show that carefully controlled fiscal deficits can promote rather than impede growth when they are allocated to worthwhile capital expenditure. This shows how important the FRBM framework is in India. It encourages fiscal restraint and debt sustainability, which fits well with the government's new CapEx-led growth strategy, which puts more emphasis on investing in technology, infrastructure, and logistics. When used together, these steps can find a balance between the need for growth and fiscal restraint. This will make sure that deficit financing encourages long-term, profitable investment while keeping the economy stable. These insights provide clear guidance for policymakers aiming to enhance growth outcomes through the optimization of public finance composition and management.

V. Limitations and future scope of the study

Even though this study gives strong evidence of the long-term link between India's fiscal deficit and economic growth, it has some limits. First, utilizing aggregate annual time-series data may hide big differences in fiscal policy between sectors and types of spending, especially between spending on consumption and spending on productive capital. Second, the ARDL framework presumes parameter stability across the entire period (1991–2024), encompassing diverse integration orders and limited samples. The anticipated correlations may be influenced by unrecognized structural breaks resulting from India's evolving fiscal policies, including the FRBM framework, the introduction of the GST, and fiscal expansions triggered by pandemics. Third, the study examines only a limited set of macroeconomic variables, neglecting other factors that may influence growth, such as inflation, monetary policy, external sector dynamics, and institutional quality. Finally, even when a stable long-term link has been made, the possibility of reverse causation makes it impossible to draw a clear conclusion about causality. Future research may employ state-level panel data, causal econometric techniques, or structural break models to address these issues.

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