

Role of Institutions in Economic Growth of India: A Time-Series Analysis

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Abstract

The study empirically examines the role of institutional quality in shaping India's economic growth over the period 1996–2023. Using annual time-series data, the analysis investigates the long-run and short-run relationships between GDP per capita and key governance indicators control of corruption, political stability, and voice and accountability alongside selected macroeconomic variables, namely health expenditure, trade openness, and foreign direct investment inflows. The Autoregressive Distributed Lag (ARDL) bounds testing approach is employed to test for cointegration among the variables, followed by estimation of long-run coefficients and an error correction model to capture short-run dynamics. The results confirm the existence of a stable long-run relationship between institutional quality and economic growth in India. Control of corruption and voice and accountability emerge as robust and statistically significant drivers of long-run per capita income growth, underscoring the importance of transparent and accountable governance structures. Political stability exhibits a positive but relatively weaker influence. Among the macroeconomic variables, health expenditure and trade openness contribute positively to long-run growth, while foreign direct investment is found to be statistically insignificant in the long run and negative in the short run. The error correction term indicates a rapid adjustment towards long-run equilibrium following short-term shocks. Robustness checks using Fully Modified Ordinary Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) corroborate the main findings. Overall, the study highlights that sustained economic growth in India is closely linked to improvements in institutional quality, particularly in reducing corruption and strengthening democratic accountability, alongside investments in human capital and openness to trade.

Keywords: Institutions, ARDL, economic growth, FDI inflows, health expenditure, trade openness.

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1. INTRODUCTION

Simon Kuznets defined economic growth as a sustained increase in an economy's capacity to produce a diverse range of goods and services, driven by technological progress and the institutional adjustments that accompany it. Economic growth remains a central concern in economics due to its strong association with improvements in income levels, employment, and living standards. Understanding the factors that drive long-term growth has therefore been a core objective of economic theory and policy.

Early growth theories focused primarily on capital accumulation, savings, investment, and competitive market behaviour. Over time, the scope of growth analysis expanded to include human capital formation, technological innovation, and learning processes. More recently, growing attention has been paid to non-economic determinants of growth,

particularly institutions, which shape incentives, reduce uncertainty, and influence economic behaviour.

The New Institutional Economics emphasizes the role of institutions as the “rules of the game” governing economic, political, and social interactions (North, 1990). Formal institutions, such as laws, regulations, and property rights, help reduce transaction costs and enforce contracts, while informal institutions social norms, customs, and values shape behaviour and facilitate cooperation. A large body of empirical evidence suggests that countries with stronger, more accountable institutions tend to experience higher and more sustained economic growth, whereas weak institutional frameworks are associated with lower growth and greater economic uncertainty.

India offers an important context for examining the institutions–growth nexus due to its evolving

institutional framework. While the country possesses established formal institutions, including a democratic political system and an independent judiciary, informal institutions rooted in social and cultural norms continue to play a significant role in shaping economic outcomes. This interaction makes India a compelling case for analysing how institutional quality affects economic growth in a developing economy.

This study empirically examines the relationship between institutional quality and economic growth in India by focusing on key governance indicators alongside macroeconomic variables. By doing so, it contributes to the literature on institutional determinants of growth and provides policy-relevant insights into the role of governance in sustaining long-term economic development.

2. REVIEW OF LITERATURE

This section reviews the theoretical and empirical literature linking institutions and economic growth, charting the evolution of thought from classical institutionalism to contemporary studies. It begins with the conceptual foundations laid by Old and New Institutional Economics, then examines global evidence on how institutional quality affects growth, and finally discusses historical path-dependence in institutional development and empirical findings from India's context. Throughout, the review highlights how strong, inclusive institutions emerge as "deep determinants" of long-run development, while also identifying gaps – especially in the Indian context – that motivate the present study.

2.1 Conceptual foundations: from OIE to NIE

Institutional economics evolved in two broad waves. Early Old Institutional Economics (OIE) scholars like Thorstein Veblen and John R. Commons argued that economic behaviour is deeply embedded in social norms, legal contexts, and evolutionary processes, challenging the atomistic, static assumptions of classical economics (Veblen, 1898; Commons, 1931). Veblen, for example, critiqued the neoclassical "hedonistic calculus" of a rational actor, calling for an evolutionary science of economics that considers historical and cultural context. He proposes that economics should focus on cumulative causation and the co-evolution of institutions and behavior, rather than assuming equilibrium and utility maximization. Commons likewise emphasized collective action and legal institutions, viewing transactions (not isolated individuals) as the fundamental unit of economic analysis. This OIE perspective underscored that informal norms and power structures shape economic outcomes, laying a foundation for later theories.

In the mid-20th century, the New Institutional Economics (NIE) revitalized institutional analysis by incorporating it into mainstream economic theory with formal analytic tools. Ronald Coase and Douglass North were instrumental in this shift. It was Ronald Coase

(1960) who made the crucial connection between institutions, transaction costs, and neo-classical theory. The neo-classical result of efficient markets only obtains when it is costless to transact. Only under the conditions of costless bargaining will the actors reach the solution that maximizes aggregate income regardless of the institutional arrangements. When it is costly to transact then institutions matter. Coase (1937; 1960) highlighted how transaction costs and property rights influence firm organization and market efficiency, insisting that "economics as it ought to be" must account for real-world legal and organizational constraints. North (1986) famously defined institutions as the "rules of the game" both formal rules (like laws, constitutions) and informal norms – that structure incentives and shape human interaction. By reducing uncertainty and transaction costs, good institutions enable more efficient exchanges and better economic performance.

A key insight of NIE is path dependence: institutional choices made at critical historical junctures can lock economies into particular development trajectories. North and others argued that because institutions evolve slowly and incrementally, past institutional frameworks (e.g. colonial legal systems or feudal land arrangements) exert long-lasting effects on present-day economic outcomes. North argues that institutions are not grounded solely in technical or economic efficiency. Rather, they emerge from the interplay of power, individual strategies, and prevailing ideologies. To understand them properly, he suggests adopting the framework of New Institutional Economics (NIE). NIE thus bridges historical context with economic modeling, providing the theoretical basis for focusing on institutional quality measurable attributes like rule of law, state capacity, and governance as a determinant of growth. This study adopts that basis, treating institutional quality as a key explanatory construct.

2.2 Global Empirical Evidence on Institutions and Growth

Over the past few decades, a large body of cross-country empirical research has reinforced the primacy of institutions in economic development. Broadly, countries with inclusive, well-governed institutions that secure property rights, uphold contracts, and check governmental power have achieved significantly higher long-run growth and income levels than those with weak, extractive institutions. Pioneering work by Acemoglu, Johnson, and Robinson (2001) provided a striking demonstration of this pattern: using colonial-era settler mortality as an instrument, they showed that the causal driver of divergent development outcomes was the type of institutions established (inclusive vs. extractive), rather than settlers' health or other geographic factors. In their analysis, former colonies where settlers could safely reside tended to adopt inclusive, property-protecting institutions and are far richer today, whereas colonies with high settler mortality were often saddled with extractive institutions

that have led to persistently lower incomes (the “colonial origins” hypothesis). This influential finding cemented the view that institutional quality is a “deep determinant” of economic performance, more fundamental than geographic endowments or even trade policy in explaining cross-country differences (Acemoglu et al., 2001; 2002). Subsequent studies have corroborated this using various measures and methods: for example, indices of economic freedom and governance effectiveness are strongly associated with higher growth rates. Dawson (1998) finds that countries with greater economic freedoms (e.g. secure property rights, freedom to trade, limited government intervention) not only invest more but experience faster total factor productivity growth, highlighting the role of market-friendly institutions in fostering development. Similarly, contemporary analyses show that improvements in rule of law, regulatory quality, and government effectiveness tend to cause higher income per capita, often with sizable effects on investment and human capital accumulation (Knack & Keefer, 1995; Parsa & Datta, 2022).

2.3 Indian Empirical Evidence

While global research has firmly established the institutions-growth nexus, systematic sub-national analysis within countries are less common. India provides a compelling case of one nation with shared formal institutions (a common constitution and legal framework) but wide variation in institutional quality across states. However, the empirical literature exploring this variation remains relatively nascent. Most studies that do exist confirm that institutional differences matter for development within India, paralleling the global findings. For instance, state-level analysis have found that Indian states with stronger governance and economic institutions tend to enjoy higher income levels and faster growth. Pattanaik and Nayak (2014) show that states scoring higher on economic freedom characterized by smaller government, better legal structure, and flexible market regulations significantly outperform others in per capita GSDP growth.

Likewise, a recent panel study by Jain (2021) constructed a composite Institutional Quality Index for Indian states (encompassing governance capacity, law and order, and economic efficiency dimensions) and found that improvements in this index are associated with higher state GDP per capita and growth rates, even after controlling for investment and human capital. These results align with earlier observations that states with better rule enforcement, regulatory quality, and public service delivery create a more conducive environment for investment and productivity, thus spurring growth (e.g., the case of Gujarat or Tamil Nadu often cited in policy discussions). Some research also suggests that institutional quality can moderate the effects of other growth determinants: for example, fiscal policy effectiveness appears to depend on institutions – Nirola and Sahu (2019) find that while large government size generally impedes state growth, this negative effect is

significantly weaker in states with higher institutional quality, implying good governance can offset the downsides of big government. Such findings reinforce that improving governance can amplify the returns to development policies and investments at the state level.

At the same time, the Indian evidence highlights complex dynamics and some puzzles. One notable study by Subramanian (2007) examined India’s institutional evolution over several decades and found that, contrary to expectation, many institutional performance indicators stagnated or even deteriorated through periods of high economic growth. For example, measures like bureaucratic efficiency, legal delays, or infrastructure provision saw little sustained improvement, suggesting that India’s growth in the 1990s–2000s was achieved in spite of institutional weaknesses rather than because of institutional transformation. Moreover, Subramanian noted that rapid growth did not automatically catalyze better governance a paradox where growth spurts did not translate into institutional upgrades, nor did weak institutional progress seem to hold back short-term growth spurts. This underscores the possibility of decoupling between growth and institutions in the short to medium run, possibly due to factors like economic reforms unlocking pent-up productivity or private sector adaptation to poor governance.

More recent work provides a nuanced picture: Singh (2020) developed an elaborate Governance Index for Indian states (covering political accountability, state administrative capacity, and fiscal performance) over 1985–2016 and found evidence of institutional convergence poorer states have improved some governance aspects (notably democratic accountability) faster than richer states, narrowing the gap in those dimensions. However, other dimensions such as bureaucratic capacity have lagged or even declined in many regions, revealing a differentiated trend. Using this index, Singh further demonstrated through panel econometric analysis that increases in political accountability (e.g. electoral competitiveness, transparency) have a positive causal impact on state investment rates and per-capita income growth, whereas improvements in certain administrative capacity measures did not show the expected growth payoff. Crucially, his results found no evidence that higher growth leads to better governance in the short run, implying that the causality in India runs primarily from institutions to growth rather than vice versa.

These insights resonate with case-study observations that some Indian states (Kerala, for instance) achieved high social outcomes with modest growth due to strong institutions, whereas others (like some resource-rich states) grew for a time despite weak institutions but eventually faced sustainability challenges. They also highlight that not all institutions matter equally the quality of political and bureaucratic incentives might be more decisive for growth than just

the size of government or formal rules on paper. Methodologically, recent Indian indices rely on transparent transformations and hierarchical aggregation of administrative indicators, often revealing low inter-dimensional correlations a rationale for reporting dimension-wise effects (e.g., accountability vs capacity vs fiscal performance) rather than only a single composite.

3. DATA AND METHODOLOGY

The present study utilizes time-series data spanning from 1996 to 2023 for both the dependent and

independent variables. The dependent variable is Gross Domestic Product Per Capita (GDPPC), which serves as a proxy for India's economic growth. The independent variables include CC (Control of Corruption), PS (Political Stability), VA (Voice and Accountability), HE (Health Expenditure), TP (Trade Openness), and FDI (foreign direct investment) inflows. The details of the independent and dependent variables are presented in Table 1.

Table 1: Description of the Variables

Variables	Symbols	Data Source
Per Capita Gross Domestic Product	GDPPC (In US Dollars)	World Development Indicators, World Bank
Control of Corruption	CC	Worldwide Governance Indicators, World Bank
Political Stability	PS	Worldwide Governance Indicators, World Bank
Voice and Accountability	VA	Worldwide Governance Indicators, World Bank
Health Expenditure	HE (In US Dollars)	World Development Indicators, World Bank
Trade Openness	TP (% GDP)	World Development Indicators, World Bank
Foreign Direct Investment	FDI (In US Dollars)	World Development Indicators, World Bank

Source: Prepared by Author

3.1 Methodological Framework

To examine the influence of the selected independent variables on India's economic growth, the following log-linear regression model has been employed:

$$\ln \text{GDPPC}_t = \beta_0 + \beta_1 \ln \text{CC}_t + \beta_2 \ln \text{PS}_t + \beta_3 \ln \text{VA}_t + \beta_4 \ln \text{HE}_t + \beta_5 \ln \text{TP}_t + \beta_6 \ln \text{FDI}_t + \mu_t \quad (1)$$

In this equation, the subscript t denotes time in years, and μ represents the stochastic error term.

The descriptive statistics of the variables were assessed using measures such as the mean, median, and mode to understand their underlying behaviour. The Jarque–Bera test was applied to evaluate the normality of the data. Additionally, correlation analysis was conducted to explore the relationships among the variables.

Unit root test

Prior to analyzing the short- and long-run dynamics among the variables, it is imperative to ascertain the stationarity properties of the time-series data. Failure to address non-stationarity may result in spurious regression outcomes, wherein the estimated relationships among variables appear statistically significant despite being non-existent in reality (Phillips and Perron, 1988). To evaluate the stationarity characteristics of the variables, the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test are employed.

Lag Length Selection

The ARDL model incorporates lagged values of both the dependent and independent variables. Prior to estimating the ARDL specification, the optimal lag length must be identified using criteria such as the

Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), Hannan–Quinn (HQ) Criterion, among others. The lag structure that minimises the chosen information criterion is selected as the optimal lag.

The ARDL model

The ARDL model framework has been chosen to examine both the short-run and long-run relationships between GDP and the selected independent variables. ARDL model can only be estimated if all variables are either stationary at level [I(0)] or at first difference [I(1)], and none should be integrated at the second difference [I(2)], as the ARDL model cannot be applied in the presence of I(2) variables (Nkoro and Uko, 2016).

The ARDL Bounds Test, as proposed by Pesaran and Shin (1999) and Pesaran et al. (2001), is applied to determine the existence of a long-run relationship among the variables. If a long-run relationship is confirmed, the long-run coefficients are subsequently estimated. This is followed by the estimation of the Error Correction Model (ECM), which captures the short-run dynamics of the relationship. The ECM also indicates whether the system tends to return to its long-run equilibrium following short-term deviations, or if it diverges, leading to long-run disequilibrium.

To estimate the coefficients of the ARDL (Autoregressive Distributed Lag) model, the following equation has been employed:

$$\Delta \ln \text{GDPPC}_t = \alpha_0 + \delta_1 \ln \text{GDPPC}_{t-1} + \delta_2 \ln \text{CC}_{t-1} + \delta_3 \ln \text{PS}_{t-1} + \delta_4 \ln \text{VA}_{t-1} + \delta_5 \ln \text{HE}_{t-1} + \delta_6 \ln \text{TP}_{t-1} + \delta_7 \ln \text{FDI}_{t-1} + \sum_{i=1}^{p-1} \theta_i \Delta \ln \text{GDPPC}_{t-i} + \sum_{j=0}^{q_1-1} \beta_{1j} \Delta \ln \text{CC}_{t-j} +$$

$$\begin{aligned} & \sum_{j=0}^{q_2-1} \beta_{2j} \Delta \ln PS_{t-j} + \sum_{j=0}^{q_3-1} \beta_{3j} \Delta \ln VA_{t-j} \\ & + \sum_{j=0}^{q_4-1} \beta_{4j} \Delta \ln HE_{t-j} + \sum_{j=0}^{q_5-1} \beta_{5j} \Delta \ln TP_{t-j} + \\ & \sum_{j=0}^{q_6-1} \beta_{6j} \Delta \ln FDI_{t-j} + e_t \end{aligned} \tag{2}$$

Here, δ_1 to δ_7 are the long run coefficients of the model. The ARDL model of order $(p, q_1, q_2, q_3, q_4, q_5, q_6)$ represents the number of lags selected for the log-transformed values of the respective variables, where p refers to the lag length of the dependent variable, and q_1 to q_6 denote the lag lengths of the independent variables.

ARDL Bounds test is used to check for the presence of long run association between GDPPC and the independent variables. The null and alternative hypothesis are:

H_0 : No long run relationship exists ($\delta_1 = \delta_2 = \delta_3 = \dots = \delta_7 = 0$)

H_1 : Long Run relationship exists (At least one $\delta_i \neq 0$)

If the calculated F-statistic exceeds the upper bound critical value, the null hypothesis is rejected, indicating the presence of a long-run relationship among the variables. Conversely, if the F-statistic falls below the lower bound critical value, the null hypothesis cannot be rejected, suggesting that no long-run relationship exists. The following equation is used to estimate the short-run coefficients of the model within the Error Correction Model (ECM) framework:

$$\begin{aligned} \Delta \ln GDPPC_t = & \alpha_1 + \sum_{j=0}^{q_1-1} \beta_{1j} \Delta \ln CC_{t-j} + \sum_{j=0}^{q_2-1} \beta_{2j} \Delta \ln PS_{t-j} \\ & + \sum_{j=0}^{q_3-1} \beta_{3j} \Delta \ln VA_{t-j} + \sum_{j=0}^{q_4-1} \beta_{4j} \Delta \ln HE_{t-j} \\ & + \sum_{j=0}^{q_5-1} \beta_{5j} \Delta \ln TP_{t-j} + \sum_{j=0}^{q_6-1} \beta_{6j} \Delta \ln FDI_{t-j} + \gamma ECT_{t-1} + \varepsilon_t \end{aligned} \tag{3}$$

In this equation, ECT_{t-1} represents lagged value of the error correction term, while γ denotes the speed of adjustment. A significant and negative value of γ

indicates the rate which the model will approach towards equilibrium in the long run, post short-run shocks.

Residual and Diagnostic Tests

Following the estimation of long-run and short-run coefficients, several residual diagnostic tests are conducted to assess the robustness of the model. The Breusch–Godfrey LM test is employed to detect serial correlation in the residuals, while the Jarque–Bera test is used to examine their normality. Heteroskedasticity is evaluated using the Breusch–Pagan–Godfrey test.

Model stability is assessed through the CUSUM and CUSUM of Squares tests. Additionally, the Ramsey Regression Equation Specification Error Test (RESET) is carried out to verify the correctness of the model specification.”

Robustness Check

To examine the robustness of the long-run relationship between institutional quality, macroeconomic factors, and GDP per capita, the study employs Fully Modified Ordinary Least Squares (FMOLS) and Canonical Cointegrating Regression (CCR) techniques. These estimators correct for endogeneity, serial correlation, and small-sample bias in cointegrated systems, thereby providing reliable long-run coefficient estimates.

4. RESULTS AND DISCUSSIONS

This section presents the analysis of the results and discusses the outcomes obtained.

Descriptive Statistics and Correlation Analysis

Table 2 presents the summarized information about the descriptive statistics of the variables under study and the linear correlation between different pairs of variables, all expressed in the natural logarithms.

Table 2: Descriptive Statistics and Correlation Matrix

Panel A: Descriptive Statistics							
	LNGDPPC	LNCC	LNPS	LNVA	LNHE	LNTP	LNFDI
Mean	7.082086	3.744863	2.718634	4.078757	-8.273716	3.654794	0.264466
Median	7.085449	3.768449	2.740092	4.097577	-8.404923	3.736771	0.405388
Maximum	7.727934	3.906661	3.180410	4.158883	-7.229734	4.021661	1.286619
Minimum	6.483651	3.570800	2.202237	3.897424	-9.129894	3.087832	-0.749412
Std. Dev.	0.391366	0.090381	0.243783	0.066871	0.603450	0.291559	0.518215
Skewness	0.015240	-0.325253	-0.133052	-1.538893	0.393084	-0.677771	-0.189380
Kurtosis	1.676377	2.144398	2.398862	4.338034	1.782004	2.157415	2.139055
Jarque-Bera Probability	2.045057	1.347747	0.504209	13.14028	2.451837	2.972019	1.032133
	0.359684	0.509730	0.777163	0.001402	0.293488	0.226274	0.596864
Sum	198.2984	104.8562	76.12175	114.2052	-231.6641	102.3342	7.405060
Sum Sq. Dev.	4.135519	0.220555	1.604609	0.120737	9.832116	2.295172	7.250767
Observations	28	28	28	28	28	28	28

Panel B: Correlation Matrix

Correlation	LNGDPPC	LNCC	LNPS	LNVA	LNHE	LNTTP	LNFDI
LNGDPPC	1.000000						
LNCC	0.017768	1.000000					
LNPS	0.318534	0.486347	1.000000				
LNVA	-0.709056	-0.235392	-0.647850	1.000000			
LNHE	0.973389	0.071337	0.419095	-0.792383	1.000000		
LNTTP	0.707918	-0.358968	-0.150349	-0.335017	0.571115	1.000000	
LNFDI	0.544611	-0.125616	-0.058897	-0.226225	0.446423	0.723768	1.000000

Source: Prepared by Author

Table 2 reports skewness values of most variables to be approximately symmetric, with moderate deviations for LNVA (-1.539) and LNTTP (-0.678). Kurtosis values are generally close to the normal benchmark, except for LNVA, which is leptokurtic (4.338). The Jarque–Bera test indicates that all variables are normally distributed ($p > 0.05$) except LNVA ($p = 0.0014$), which deviates from normality. The results show that GDP per capita is strongly positively correlated with health expenditure, trade openness, and foreign direct investments, but negatively correlated with voice and accountability. is mostly negatively related to

other variables, especially LNHE (-0.792) and LNPS (-0.648). LNTTP and LNFDI are strongly positively correlated (0.724).

Unit Root Test

The results of the ADF and PP tests are summarized in Table 3. The results reveal that all variables become stationary after first differencing. None of the variables are stationary at the second difference. As the variables are integrated of order I(0) or I(1), the ARDL estimation technique is deemed suitable for this analysis.

Table 3: ADF Test and PP Test Results for stationarity check

Variable	Augmented Dickey-Fuller Test				PP test			
	With Intercept		With Intercept and Trend		With Intercept		With Intercept and Trend	
	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference
lnGDPPC	0.9753	0.0007*	0.2173	0.0043*	0.9771	0.0007*	0.2173	0.0045*
lnCC	0.1864	0.0001*	0.4553	0.0010*	0.1458	0.0001*	0.3818	0.0009*
lnPS	0.1479	0.0000*	0.1896	0.0001*	0.1529	0.0000*	0.2017	0.0000*
lnVA	0.9220	0.0096*	0.9103	0.0392*	0.8733	0.0101*	0.8416	0.0415*
lnHE	0.9943	0.0229*	0.9086	0.0607	0.9882	0.0211*	0.8544	0.0656
lnTP	0.2840	0.0026*	0.8831	0.0058*	0.2840	0.0026*	0.8831	0.0060*
lnFDI	0.2455	0.0002*	0.7422	0.0852	0.2463	0.0002*	0.7379	0.0010*

Note: * indicates the rejection of null hypothesis of unit root at 5% level of significance

Source: Prepared by Author

Optimal Lag Length

Table No.4 presents the outcomes of the various criteria, based on which, the appropriate lag length for the variables is finalized.

Table 4: Lag Length Selection Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	107.2489	NA	1.06e-12	-7.711454	-7.372736	-7.613915
1	286.3089	247.9292*	5.51e-17	-17.71607	-15.00632*	-16.93576
2	353.1108	56.52469	3.77e-17*	-19.08545*	-14.00467	-17.62237*

Note: * indicates lag order selected by the respective criterions

Since out of the five selection criteria, three namely the AIC (Akaike Information Criterion), FPE (Final Prediction Error), and HQ (Hannan-Quinn) suggest that a lag length of 2 is optimal. Hence, based on the majority rule, the lag length of 2 is chosen for further analysis.

ARDL Bounds Test

To check the long-run relationship between economic growth and the independent variables, ARDL Bounds test is applied and its outcomes are displayed in Table 5.

Table 5: Test for Cointegration: Bounds Test

Test Statistics	Value	K
F-Statistic	11.66106	6
Critical Value Bound		
Significance	I(0)	I(1)
10%	2.33	3.25
5%	2.63	3.62
2.5%	2.9	3.94
1%	3.27	4.39

Source: Prepared by author

Since the computed F-statistic (11.66106) exceeds the upper bound critical values at all four significance levels, the null hypothesis of no long-run association among the variables is rejected. Therefore, the results of the Bounds test confirm the existence of a long-run relationship between GDPPC and selected independent variables.

ARDL Long run form Estimation and ECM

Having established the presence of a long-run relationship, estimation of the long-run and short-run coefficients of the variables under study is carried out. Table 6 presents the relevant coefficients of the estimated ARDL model and the Error Correction Model.

Table 6: Estimates of Long Run and Short Run Form of ARDL Model (1,1,0,0,1,1,2)

Panel A: Long Run Coefficient			
Variable	Coefficient	t-Statistic	Prob.
lnCC	0.5060	5.6455	0.0001
lnPS	0.0756	2.3705	0.0354
lnVA	0.9056	6.8375	0.0000
lnHE	0.1403	2.2299	0.0456
lnTP	0.2060	3.3834	0.0054
lnFDI	-0.0078	-0.4919	0.6316
Panel B: Short Run Coefficient: Error Correction Model			
Variable	Coefficient	t-Statistic	Prob.
C	1.0179	12.9599	0.0000
D(lnCC)	0.1259	4.9005	0.0004
D(lnFDI)	-0.0384	-6.9310	0.0000
D(lnFDI(-1))	-0.0262	-4.3653	0.0009
D(lnHE)	-0.1220	-2.9517	0.0121
D(lnTP)	0.0433	1.7792	0.1005
CointEq(-1)*	-0.8030	-12.1534	0.0000

Note: * p-value incompatible with t-Bounds distribution

Panel A of Table 6 presents the long-run estimates of the ARDL model, indicating that control of corruption (lnCC) has a positive and statistically significant effect on GDP per capita, suggesting that improved institutional quality enhances economic efficiency and long-term income levels. Political stability (lnPS) also exerts a positive and significant influence, implying that a stable political environment fosters investor confidence and supports sustained economic growth. The coefficient of voice and accountability (lnVA) is positive and highly significant, highlighting the role of democratic governance and institutional transparency in promoting long-run economic well-being. Health expenditure (lnHE) shows a positive and statistically significant relationship with GDP per capita, underscoring the importance of health investment in strengthening human capital and productivity over time. Likewise, trade openness (lnTP) positively and significantly affects GDP per capita, indicating that greater integration with global markets

facilitates efficiency gains and long-term income growth. In contrast, foreign direct investment (lnFDI) exhibits a negative but statistically insignificant coefficient, suggesting that FDI inflows have not made a meaningful contribution to per capita income growth during the study period, possibly due to limited spillover effects or structural constraints.

Panel B of Table 6 reports the short-run dynamics from the Error Correction Model, where the constant term is positive and statistically significant, indicating a strong baseline level of short-term economic activity. Control of corruption (D(lnCC)) exerts a positive and highly significant effect on GDP per capita, suggesting that short-term improvements in governance immediately enhance economic confidence and efficiency. In contrast, foreign direct investment (D(lnFDI)) and its lagged term display negative and statistically significant coefficients, implying that FDI inflows adversely affect GDP per capita in the short run,

possibly due to adjustment costs, volatility, or limited immediate spillover effects. Health expenditure (D(lnHE)) shows a negative and significant short-run impact, indicating that increased health spending may initially impose fiscal burdens before generating productivity gains. Trade openness (D(lnTP)) has a positive but statistically insignificant coefficient, suggesting that short-term trade fluctuations do not directly influence per capita income. The error correction term (CointEq-1) is negative and highly significant, confirming long-run equilibrium and indicating that

approximately 80.3 per cent of short-run disequilibrium in GDP per capita is corrected within one period, reflecting a rapid adjustment process following short-term shocks.

Diagnostic Tests

Several diagnostic tests have been applied to test the robustness i.e. the reliability and consistency of the estimated model. Additionally, CUSUM and CUSUMSQ tests have been conducted to ensure the model's stability quotient.

Table 7: Summary of applied Diagnostic Tests

Test	Test Statistic	Probability	Results
Jarque- Bera test (normality test)	0.0969	0.9526	Residuals are normally distributed
Breusch-Godfrey Serial Correlation LM test	0.4821	0.6312	No serial correlation exists
Breusch-Pagan-Godfrey (Heteroskedasticity)	12.6633	0.4741	No presence of Heteroskedasticity
Ramsey RESET Test	0.0058	0.9405	No specification error

Table 7 presents the summary of the diagnostic tests. It confirms that estimated model is accurate and free of serial correlation and heteroskedasticity. Also, residuals are normally distributed. Further, the test statistic under Ramsey RESET test suggest that no specification bias exist in the model which means that the model is correctly specified.

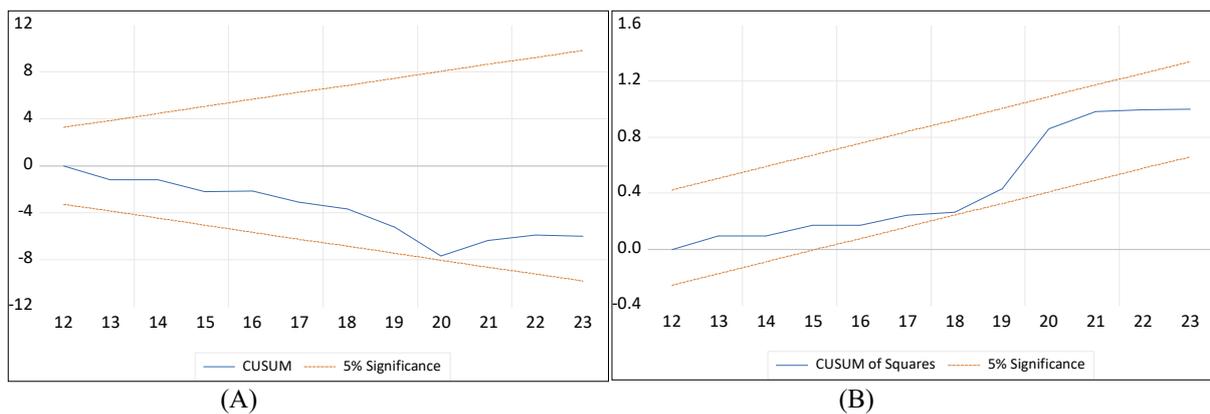


Figure 1: CUSUM and CUSUMSQ Tests

In both graphs (A) and (B) of Figure 1, the plotted lines remain within the 5% critical bounds, indicating that the estimated ARDL model is stable. Graph (A), representing the CUSUM test, and graph (B), representing the CUSUMSQ test, both confirm the absence of any structural instability in the model over the sample period.

Robustness Check

Panel A: Fully Modified Least Squares (FMOLS)			
Variable	Coefficient	t-Statistic	Prob.
lnCC	0.3231	2.4645	0.0229
lnPS	0.0524	0.7873	0.4403
lnVA	0.8303	2.7989	0.0111
lnHE	0.6018	19.842	0.0000
lnTP	0.3938	6.3293	0.0000
lnFDI	-0.0117	-0.4320	0.6704
R-squared	0.9881		
Adjusted R-squared	0.9845		
Panel B: Canonical Cointegrating Regressions (CCR)			
Variable	Coefficient	t-Statistic	Prob.
lnCC	0.3402	2.1726	0.0420
lnPS	0.0562	0.6108	0.5482
lnVA	0.8465	2.4200	0.0252

lnHE	0.6034	19.0379	0.0000
lnTP	0.3938	5.2239	0.0000
lnFDI	-0.0132	-0.4047	0.6899
R-squared	0.9879		
Adjusted R-squared	0.9842		

The FMOLS results show that control of corruption, voice and accountability, trade openness, and health expenditure exert positive and statistically significant effects on GDP per capita, highlighting the long-run importance of governance quality, openness, and human capital development for economic performance. In contrast, political stability and foreign direct investment are found to be statistically insignificant, suggesting limited long-run influence during the study period. The CCR estimates closely corroborate the FMOLS findings, displaying similar coefficient signs and levels of significance, thereby reinforcing the robustness of the long-run relationships. The robustness of the long-run relationship is supported by the high explanatory power of both the FMOLS and CCR models. In the FMOLS estimation, the R-squared and adjusted R-squared values are 0.9881 and 0.9845, respectively, indicating that over 98 per cent of the variation in GDP per capita is explained by the selected explanatory variables. Similarly, the CCR model reports R-squared and adjusted R-squared values of 0.9879 and 0.9843, confirming a comparably strong model fit. The close alignment between R-squared and adjusted R-squared in both estimations suggests model stability and the absence of overfitting.

5. CONCLUSION

The study examines the role of institutional quality in shaping India's economic growth over the period 1996–2023 using an ARDL time-series framework. It incorporates impact of key governance indicators control of corruption, political stability, and voice and accountability along with health expenditure, trade openness, and foreign direct investment on GDP per capita of India. Among institutional factors, control of corruption and voice and accountability emerged as the most robust and economically meaningful determinants of long-run growth. These findings underscore the importance of inclusive, transparent, and accountable governance structures in enhancing economic efficiency, strengthening investor confidence, and sustaining income growth. Political stability exhibits a positive effect in the ARDL long-run estimates, though insufficient without broader improvements in governance quality.

The analysis further reveals that health expenditure and trade openness play a critical role in supporting long-term economic growth. While health spending imposes short-run fiscal pressures, its positive long-run impact highlights the importance of human capital formation in raising productivity and income levels. Similarly, trade openness contributes to growth

over time by facilitating efficiency gains, technological diffusion, and integration with global markets. In contrast, foreign direct investment does not exhibit a significant positive impact on GDP per capita in the long run and is found to exert a negative influence in the short run, indicating limited spillover effects and the presence of structural constraints in the Indian economy. The error correction mechanism indicates a rapid adjustment towards long-run equilibrium, implying that deviations caused by short-term shocks are quickly corrected.

The results suggest that improvements in governance quality particularly in reducing corruption and strengthening democratic accountability are essential for sustaining long-term development. The study highlights the need for institutional reforms that go beyond macroeconomic management and focus on strengthening transparency, accountability, and state capacity to ensure that economic growth is both sustained and inclusive.

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