

# Regional analysis on the relationship between Economic Growth and Democracy: Evidence from India

**Sarbapriya Ray**

Assistant Professor, Department of Commerce, S. S. Mahavidyalaya, Calcutta University, India

**Ishita Aditya Ray**

Assistant Professor, Department of Political Science, B. N. Mahavidyalaya, Burdwan University, India

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## **Abstract:**

There has been ongoing debate on the direction of causality between economic growth and democracy all over the world. We examine the long-run relation between democracy and economic growth via GDP growth for a developing country like India at regional level as well as national level. The present study uses Vector error Correction Model to direct the nature of causality between growth and democracy and we also construct a co-integration model for the Indian economy to examine the relationship between economic growth and democracy. Using co-integration analysis for the period 1980-81 to 2009-10, we seek to identify the relationship between economic growth and democracy. Our empirical results suggest that there is a long run bi-directional causality between economic growth and democracy in India. Moreover, our statistical investigation confirms that democracy affects economic growth positively and vice versa both at regional level as well as aggregate level while considering the entire time frame in a unified snapshot although some indiscriminate negative trend is noticed during pre-reform period where democracy affects economic growth negatively and vice versa.

**Key words:** Co-integration, democracy, economic growth, GDP, India

## **Introduction:**

The relationship between economic growth and democracy is a controversial issue in the literature of comparative politics and political economy. Empirical studies have reached various conclusions, depending upon the sample, data and model utilized. Moreover, there is divergence between certain countries in terms of the relationship between economic growth and democracy. Thus, country specific models have critical importance to shed light on these deviations between those different countries. Scholars have long suspected that regime type plays an important role in influencing economic growth but there is little consensus in the statistical literature as to whether

the effects are positive or negative. This article sheds new light on this debate by incorporating the insight of regional studies into the statistical debate. There is a long standing presumption that democracy takes roots and survives where level of economic development and education is high and debate is still going on all over the world regarding direction of causality between democracy and economic growth. There is a great deal of literature dealing with the relationship between democracy and economic development. It can cautiously be argued that the possibly bidirectional relationship between democracy and economic development via growth is one of the most popular topics both in comparative politics and political economy.

Democracy as a national political system gained wide acceptance in the past half century as the percentage of the world population living under elected governments with universal suffrage rose from 31% to 58.3%. Between 1980 and 2000, 81 countries took significant steps toward democracy. Despite this impressive progress, some 60 countries are still ruled by authoritarian regimes. Moreover, numerous newly democratized nations reverted to authoritarian regimes. Others have seen their progress toward democracy stall in a limbo of semi-democracy. Democratic structures benefit countries in numerous ways. They promote rule of law, open society, freedom of choice, and stable politics, which discourages corruption and extremist policies. Democratic nations, according to a 2002 UN report, are also better at managing conflicts, avoiding catastrophes, and dealing with major public health crises. With few exceptions, developed nations are also democratic states.

An unresolved issue is whether democracy promotes economic growth better than other systems. For the developing world, this question is critical as economic growth is typically portrayed as the path to prosperity. In newly developing democratic countries, citizens' demand will rapidly escalate and generate high levels of government spending. This reduces the surplus available for investment, with a consequent negative effect on economic growth. Yet, if democracy fails to deliver higher economic growth than authoritarian regimes, the implicit short-term policy goal for poor developing countries is that they should concentrate on activities that promote economic growth until they achieve a degree of affluence. The arguments that democracy has positive effects is more recent but it is also compelling. If politicians fails to manage the economy as citizens wish, the electoral mechanism gives citizens the ability to evict these politicians. This provides a powerful check against executives who utilize their power to enrich themselves and their cronies.

However, scholars have not reached consensus about either the causal direction of the relationship or the empirical results reached regarding the relationship between economic growth and democracy. While some works find that the causal relationship flows from economic growth to democracy, others contend that democratic countries are more conducive to economic development. Other strands in the literature argue that there is no significant relationship, or there is a negative relationship rather than a positive relationship, between economic growth and democracy for both directions. “Inconsistent modeling arguments” and “selection bias” are among the explanations cited for the ambiguous results in the literature (Brunetti, 1997; Przeworski and Limongi, 1993). In addition to these factors, cultural variations based on regional differences are also important factors (Helliwell, 1994; Krieckhaus, 2006). In other words, geographical dynamics that condition the relationship between economic growth and democracy distinguish the case of Africa from Asia or Asia from the Western world. Moreover it is rather possible to see deviations concerning democracy-economic growth nexus for different countries (Heo and Tan, 2001).

However, very little research has been done so far in India which emphasizes this politico-economic issue. Since the existence and direction of the above-mentioned relationship is still in question, we contend that an empirical investigation of India as a case might shed light on these unanswered questions. The study attempts to examine the long-term relationship between economic growth and democracy in India over the period 1980-81 to 2009-10 by using co-integration analysis based on Johansen methodology.

The rest of the paper is organized as follows: section 2 depicts present scenario of India’s political economy, section 3 discusses theoretical foundation behind democracy- growth nexus, and existing literature is reviewed in section 4. Section 5 presents the methodology and result has been analyzed in section 6. Ultimately, Section7 presents conclusions.

## **2. India’s political economy scenario during our study period, 1980-81to2009-10**

Since about 1980, India’s political economy started moving in new directions. Unfortunately, India still remains a country of numerous poor, illiterate and unhealthy people. Significant pockets of violence also continue to dot the political landscape. One only has to recall the decade of the 1970s to underline some key features of the “old” India. During that decade, the then Prime Minister, Mrs.Indira Gandhi accentuated Nehru’s socialism in a populist direction, committed the

Indian state to poverty alleviation, mobilized the poor, and centralized power in her government. Opposition forces undertook their own mobilization against Indira Gandhi. Political polarization produced a series of rapid political changes in the late 1970s: the proclamation and the rescinding of a national Emergency, Indira Gandhi's electoral defeat, the inability of opposition forces to provide stable government, and the return of Indira Gandhi to power. Populism and instability hurt economic growth, leading to a lack luster decade for the economy. Indira Gandhi's rhetorical commitment to the poor was also not translated into meaningful outcomes; a sluggish economy and an organizational inability to intervene on behalf of the poor remained major obstacles. As national elections were concluded in 2009, some striking features of a new Indian political economy were evident, though important continuities with old India also remained. Following four (1971-2009) decades of nearly steady and rapid economic growth, the elections were normal and peaceful. Competing political parties largely agreed on the basic approach to the economy: a commitment to economic growth and indigenous capitalism; modest global opening; and some commitment to the poor. No major political party argued for socialism.

A firmly rooted democracy, a shared commitment to growth and national capitalism, and fairly rapid economic growth are key features of India's new political economy. This, however, is not the full picture. Four decades of economic growth have been accompanied by growing inequalities. The gains for the poor have also been only modest; their dissatisfactions often spill into a variety of political arenas. It remains unclear whether future economic growth will be more inclusive than in the recent past. A rhetorical commitment to the poor and an inability to translate this commitment into real gains for the poor thus remain shared features of the old and the new Indian political economy. Nevertheless, even on the issue of poverty, there are some important differences between then and now. A sluggish economy and organizational inabilities were major obstacles to helping the poor in the pre-1980 period. In the new context of a buoyant economy, resources to help the poor ought to be available. What is now doubtful is the depth of the commitment of India's pro-business leaders to the poor. Even if this commitment turns real, however, as in the past, the state's capacity to reach to the poor continues to be limited; improving this capacity will remain a pre-condition of successful state intervention on behalf of the poor.

Ever since independence, a highly interventionist state has been very much in command of the economy. Since the state structures the life chances of many, power in Indian democracy is contested vigorously, from the top to the bottom. The winners in turn use their positions and

power just as vigorously, at times in the interest of the general good, but just as often for narrow, self-serving ends. The recent economic liberalization has reduced the role of the state in Indian society, but only somewhat. The state still sets the basic direction of the economy, controls enormous resources, and access to the state continues to attract the energies of numerous Indians. Any full understanding of contemporary Indian political economy then must begin with an analysis of economically relevant political changes in the nature of the Indian state.

By the early 1980s, the world was changing, with pro-market ideas and practices in ascendance. Within India too, socialism was getting discredited as failures of anti-poverty programs and of public sector enterprises accumulated. When Rajiv Gandhi came to power, he and his technocratic team used the occasion to make a clean break from socialism, opening room for Indian capital to flourish. The loudly announced liberalization of 1991 opened the Indian economy to global forces, but only incrementally. The pace and scope of economic opening in India has been carefully orchestrated by India's nationalist rulers; the goal has been to preserve the well being of indigenous business groups. More than that, the Indian state in recent years has become an active supporter of Indian business groups, protecting their interests here, subsidizing them there, and promoting public-private partnerships in yet other arenas. If Indian state has taken the lead in constructing a state-business ruling alliance, Indian business groups have hardly been mere passive recipients of manna from above. Power and influence of Indian business has grown enormously in recent decades, a power that business groups have used to mold state behavior. This power is both diffuse and well organized.

### **3. Theoretical Foundation of the relationship between democracy and economic growth:**

Many studies attempt to hypothesize the confusing relationship between democracy and economic development. A great deal of cross-sectional research investigates the relationship between economic development and democracy: Does economic development cause democracy, or does democracy cause economic development? Multiple theoretical explanations have been proposed. Some of these observe that one variable directly impacts the other; others identify an indirect relationship between the two variables, positing instead that other intervening or conditioning variables affect the relationship. In this section, we try to demonstrate the abovementioned direct and indirect association for both the relationship flowing from economic growth to democracy, and from democracy to economic growth. The literature on the possible association of economic growth and democracy is as old as political economics itself. Drawing from modernization theories, assumptions about the robustness of the relationship between

economic growth and democracy are still prevalent in the literature. Dating back to Lipset (1959), economic development via growth has been well documented as one of the most important determinants of democratic transition. Lipset's argument retains validity in more recent studies (Epstein et al., 2006). Theoretical explanations thrive regarding why and how economic growth affects or leads to democracy. The literature suggests that changes consequent to economic development lead to a myriad of social changes and political transitions, eventually leading to democracy. The emergence of the middle classes and increase in educational opportunities are two important intervening variables emphasized in the literature in explaining economic growth (Lipset, 1959; Lipset, 1994). Secondly, rising democratic demands from the working classes is another important factor emphasized in some studies (Huber et al., 1993; Rueschemeyer et al., 1992; Landman and Dellepiane, 2008). Thirdly, transformations in the allocation of "land, income, and capital" (Vanhanen, 1997; Boix, 2003; Boix and Stokes, 2003 cited in Landman and Dellepiane, 2008) are identified as factors consequent to economic development that eventually lead to democracy. Lastly, it should be noted that a political culture conducive to democracy is also cited as consequence of economic development (Putnam et al., 1993)

Another thread of literature deals with the reverse causality flowing from democracy to economic development, offering multiple theoretical explanations. There are two major insights in this literature. The first point of view argues that democracy and growth are compatible; the second standpoint contends that democracy hinders economic growth. Beginning with the first insight, there are multiple causal paths explaining the relationship. While some of these emphasize the direct impact of democracy on economic growth, others argue that there is an indirect impact. One of the most fundamental factors generally underlined in the literature is that political freedoms guarantee property rights and market competition (Leblang, 1996; Riker and Weimer, 1993). Bueno de Mesquita et al. (2001) and Olson (1993) suggest that autocratic regimes are not conducive to economic growth in the long run since they carry the elements of arbitrariness in the sense that autocrats are not subject to any checks and balances in their acts. In contrast, democratic competition is generally associated with transparency in the policy-making process (Wittman, 1989). Democratic institutions compared to any other form of non-democratic institutional framework are another critical factor facilitating economic growth in terms of their performance (North, 1989; North, 1990). The opposing view- that democracy is an obstacle to economic development-is also known as the "Lee thesis" (Sen, 1999). The Lee thesis argues that democracy, by providing political and civil rights, leads to social instability that eventually obscures economic development (Sen, 1999). In line with this approach, O'Donnell (1973)

maintains that in many nations, especially Latin American ones, economic growth could be achieved under the autocratic regimes. Other studies have maintained that demands coming from disadvantaged groups for economic redistribution would harm investment, leading to decline in economic growth (Keech, 1995; Persson and Tabellini, 1994). Similarly, Huntington (1968) emphasized the devastating impact of economic demands coming with political rights granted to the people. There are some more arguments, which build on the negative impact of democracy. While Olson (1982) contends that there is a possible problem of “rent seeking” interest groups, Nordhaus (1975) draws our attention to the economic compromises given in return for short-term “electoral” benefits (Quinn and Woolley, 2001).

#### **4. Review of the existing Literature:**

There are abundant empirical studies, which examine the link between economic development and democracy. While some of these studies focus on the impact of economic growth on democracy, others investigate the effect of democracy on economic growth.

##### **4.1. Impact of economic growth on democracy:**

There are copious empirical works dating back to Dahl (1971) that probe the impact of economic development on democracy. Employing per capita GNP as a proxy for economic development, Dahl (1971) found that “economic development between 700 and 800 1957 US dollars” is typical of polyarchies (Landman, 2003). Examining the association between economic development and democracy for 60 noncommunist countries in 1960, Jackman (1973) used cross-sectional analysis to determine that the curvilinear relationship, emphasizing the idea of a democratic threshold, is more significant than the linear relationship. He found that a certain level of economic development is a necessary condition to sustain democratic development. Subsequent studies endorsed the non-linearity argument in a similar line. However, overall, the relationship between economic development and democracy has been demonstrated as an empirically robust one. Bollen (1983), Bollen and Jackman (1985), Brunk et al. (1987), Burkhart and Lewis-Beck (1994) and Barro (1999) all have shown that economic development is an important determinant of democracy. Despite these empirical claims, counter arguments and ambiguities persist. Helliwell’s (1994) statistical analysis, too, reveals that a strong positive effect of per capita income on the level of democracy; however, his analysis shows that while economic development has positive effects for the OECD countries and Latin America, it has negative effects for Africa and the Middle East. Muller (1995), using cross-national data from a sample of 58 countries, investigated the relationship between economic development and level of democracy with focus

on the impact of income inequality; he reported, “intermediate levels of economic development are associated with the highest levels of income inequality” (Muller, 1995). From this point, he argued that “the independent negative effect of income inequality” explicate the decrease of democracy in “middle-income” nations (Muller, 1995). Glasure et al. (1999), in their analysis of the period 1972-1990, argue that there is a “trade off” between economic development and democracy (Glasure et al., 1999). Glasure et al. (1999) concluded that economic development has a significant negative effect on democratic performance in the developing and underdeveloped semi-periphery and periphery countries, while there is “no linkage” between economic development and democracy for the core developed countries (Glasure et al., 1999). Minier (2001) examined the linkage between income level, as an indicator of economic development, and democracy and underlined that the demand for democracy goes hand in hand with the level of income per capita up to a certain income threshold (about \$5000), after that point it diminishes. Recently, comparing 135 countries between 1950 and 1990, Przeworski and Limongi found that economic growth does not lead to further democratization (or democratic transition), but it does inhibit democratic collapse (Przeworski and Limongi, 1997).

This study casts serious doubt on significant statistical evidence in support of a relationship between economic development and democratic transition. In other words, it suggests that certain levels of economic development help to sustain existent democracies rather than triggering democratic transition. Recently, Robinson (2006), using an elaborate statistical model, concluded that there is no sign of a causal relationship between economic development and democracy, even though they are highly correlated.

#### 4.2. Impact of democracy on economic growth:

A great deal of empirical studies examines the reverse connection- the impact of democracy on economic growth- since the end of the 1960’s (Kurzman et al., 2002). Leblang (1996), using time series cross-national data from 1960 to 1990, reported that property rights have a positive and statistically significant impact on economic growth. With his work, Leblang (1996) not only theoretically but also empirically demonstrated that countries protecting property rights are more inclined to economic growth than those that do not, and that democratic societies tend to protect property rights in a more efficacious way than other types of governments (Leblang, 1996). Feng (1997) investigated the interactions between democracy, political stability and economic growth, using three-stage least-squares estimation, and including 96 countries between the years 1960 to 1980. Results of this study clearly show that “democracy has a positive indirect effect

upon growth through its impacts on the probabilities of both regime change and constitutional government change from one ruling party to another” (Feng, 1997). In addition, the evidence indicates, “long-run economic growth tends to exert a positive effect upon democracy” (Feng, 1997; Barro, 1997), on the other hand, found that there is a nonlinear relation between democracy and economic development by showing that democracy has an impact on democracy only up to a certain level. After that point, the relation between democracy and growth turns negative. Tavares and Wacziarg (2001) examine the empirical relationship between democracy and economic growth and assume that institutions could have various effects upon growth in several ways. Results of this study “suggest that democracy fosters growth by improving the accumulation of human capital and, less robustly, by lowering income inequality” (Tavares and Wacziarg, 2001). However, in this study, democracy hampers economic growth by “reducing the rate of physical capital accumulation and, less robustly, by raising the ratio of government consumption to GDP” (Tavares and Wacziarg, 2001). Once all of these indirect effects are accounted for, “the overall effect of democracy on economic growth is moderately negative” (Tavares and Wacziarg, 2001). Barro (1996) investigates the effect of democracy on economic growth using approximately 100 countries between the years 1960-1990 and concludes “the overall effect of democracy on economic growth is weakly negative” (Glasure et al., 1999). Similarly, Rodrik (1997) argues that there is not a “determinate relationship between democracy and growth” (Rivera-Batiz, 2002).

## **5. Methodology:**

### **5.1. Data and Variables**

The two main variables of this study are economic growth and democracy. We represent the economic growth rate by using the constant value of Gross Domestic Product (GDP) measured in Indian rupee. Data for constant value GDP was obtained from Central Statistical Organization. To estimate the effect of democracy on economic growth in India, we use the data set which includes the 30 annual observations from 1980-81 to 2009-10 covering 31 major provinces of India (dividing all provinces into 4 major regions-Eastern, western, northern, southern).

Democracy is measured by the ‘Polity’ score from the Polity IV database which provides a 21 point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy) that combines various components of democracy: competitiveness of political participation, regulation of political participation, competitiveness of executive recruitment, openness of recruitment and

constraints on the chief executive. Moreover, it is the only measure available through the entire period of our study (1980-81 to 2009-10).

Using the time period 1980-81-2009-10 for India, this study aims to examine the long-term and causal dynamic relationships between the level of democracy and economic growth.

## 5.2. Econometric specification:

This study aimed to examine the long-term relationship between democracy and GDP growth in India between 1980-81 and 2009-10. Using co-integration and Vector Error Correction Model (VECM) procedures, we investigated the relationship between these two variables. The likely short-term properties of the relationship among economic development and democracy were obtained from the VECM application. Next, unit root, VAR, cointegration and Vector Error Correction Model (VECM) procedures were utilized in turn. The first step for an appropriate analysis is to determine if the data series are stationary or not. Time series data generally tend to be non-stationary, and thus they suffer from unit roots. Due to the non-stationarity, regressions with time series data are very likely to result in spurious results. The problems stemming from spurious regression have been described by Granger and Newbold (1974). In order to ensure the condition of stationarity, a series ought to be integrated to the order of 0 [I(0)]. In this study, tests of stationarity, commonly known as unit root tests, were adopted from Dickey and Fuller (1979, 1981). As the data were analyzed, we discovered that error terms had been correlated in the time series data used in this study.

## Robustness Check:

We also employ more predictable methods to check the robustness of our results. The examination procedure conducted in this paper is as follows: first, unit root test at levels and first differences are conducted to determine whether each variable is stationary or non-stationary. To test the stationary of variables, we use the Augmented Dickey Fuller (ADF) test which is mostly used to test for unit root. Following equation checks the stationarity of time series data used in the study:

$$\Delta y_t = \beta_1 + \beta_1 t + \alpha y_{t-1} + \gamma \sum_{t=1}^n \Delta y_{t-1} + \varepsilon_t$$

Where  $\varepsilon_t$  is white noise error term in the model of unit root test, with a null hypothesis that variable has unit root. Once the number of unit roots in the series was decided, the next step before applying Johansen's (1988) co-integration test was to determine an appropriate number of lags to be used in estimation. Second, Eagle-Granger residual based test tests the existence of co integration among the variables-DCI and GDP at constant prices for the economy. Third, if a co integration relationship does not exist, VAR analysis in the first difference is applied, however, if the variables are co integrated, the analysis continues in a cointegration framework.

**Model:**

The paper is based on the following hypotheses for testing the causality and co-integration between GDP and DCI in India (i) whether there is bi-directional causality between GDP growth and Democratic index, (ii) whether there is unidirectional causality between the two variables, (iii) whether there is no causality between GDP and DCI in India (iv) whether there exists a long run relationship between GDP and DCI in India.

Primarily, we have studied the effect of democracy on economic growth and vice versa by two simple regression equations:

$$DCI_i = a + b * GDP_i \dots\dots\dots(1)$$

$$GDP_i = a + b * DCI_i \dots\dots\dots(2)$$

GDP = Gross domestic product.

DCI = Democratic index formed for Indian Republic.

t= time subscript.

The link between Economic growth (measured in terms of GDP growth) and DCI in India can be described using the following model:

$$GDP_t = \alpha + \beta DCI_t + U_t \dots\dots\dots (3)$$

Where

GDP = Gross domestic product.

DCI = Democratic index formed for Indian Republic.

t= time subscript.

The standard Granger causality test (Granger, 1988) seeks to determine whether past values of a variable helps to predict changes in another variable. In the context of this analysis, the Granger method involves the estimation of the following equations:

$$\Delta \text{GDP}_t = \delta_0 + \sum_{i=1}^q \delta_{1i} \Delta \text{GDP}_{t-1} + \sum_{i=1}^q \delta_{2i} \Delta \text{DCI}_{t-1} + \varepsilon_{1t} \dots\dots\dots(4)$$

$$\Delta \text{DCI}_t = \gamma_0 + \sum_{i=1}^r \gamma_{1i} \Delta \text{DCI}_{t-1} + \sum_{i=1}^r \gamma_{2i} \Delta \text{GDP}_{t-1} + \varepsilon_{2t} \dots\dots\dots(5)$$

where,  $\text{GDP}_t$  and  $\text{DCI}_t$  represent gross domestic product and democratic index respectively,  $\varepsilon_{1t}$  and  $\varepsilon_{2t}$  are uncorrelated stationary random process, and subscript  $t$  denotes the time period. Failing to reject:  $H_0: \delta_{21} = \delta_{22} = \dots = \delta_{2q} = 0$  implies that exports do not Granger cause industrial productivity. On the other hand, failing to reject  $H_0: \gamma_{21} = \gamma_{22} = \dots = \gamma_{2r} = 0$  implies that economic growth via GDP do not Granger cause democratic index.

Empirical works based on time series data assume that the underlying time series is stationary. However, many studies have shown that majority of time series variables are nonstationary or integrated of order 1 (Engle and Granger, 1987). The time series properties of the data at hand are therefore studied in the outset. Formal tests will be carried out to find the time series properties of the variables. If the variables are I (1), Engle and Granger (1987) assert that causality must exist in, at least, one direction. The Granger causality test is then augmented with an error correction term (ECT) as shown below:

$$\Delta \text{GDP}_t = \delta_0 + \sum_{i=1}^q \delta_{1i} \Delta \text{GDP}_{t-1} + \sum_{i=1}^q \delta_{2i} \Delta \text{DCI}_{t-1} + \beta_1 Z_{t-1} + \varepsilon_{1t} \dots\dots\dots(6)$$

$$\Delta \text{DCI}_t = \gamma_0 + \sum_{i=1}^r \gamma_{1i} \Delta \text{DCI}_{t-1} + \sum_{i=1}^r \gamma_{2i} \Delta \text{GDP}_{t-1} + \lambda_1 Z_{t-1} + \varepsilon_{2t} \dots\dots\dots(7)$$

where  $Z_{t-1}$  is the ECT obtained from the long run co-integrating relationship between economic growth and democracy. The above error correction model (ECM) implies that possible sources of

causality are two: lagged dynamic regressors and lagged co-integrating vector. Accordingly, by equation (4), exports Granger causes industrial productivity index, if the null of either  $\sum_{i=1}^r \delta_{2i} = 0$  or  $\beta_1 = 0$  is rejected.

On the other hand, by equation (5), GDP index Granger causes democracy index, if  $\lambda_1$  is

significant or  $\sum_{i=1}^r \gamma_{2i}$  are jointly significant. Economic growth and democracy cause each other (i.e. presence of bidirectional causality), if causality exists in both directions.

### 6. Empirical results:

First, we present the descriptive statistics for the above -mentioned two variables-DCI and GDP growth in table-1.

**Table-1: Descriptive Statistics for selected variables from 1980-81 to 2009-10**

Descriptive statistics					
Region/statistics	Mean	Median	Maximum	Minimum	Standard deviation
<b>Eastern region</b>					
Demo. Index.(DCI)	8.47	8.1	9.2	7.9	0.524
GDP(Rs Crore)	224670	152653	775668	22580	216875
<b>Western region</b>					
Demo. Index.(DCI)	8.47	8.1	9.2	7.9	0.524
GDP(Rs Crore)	390923	281278	1264000	32448	371161
<b>Northern region</b>					
Demo. Index.(DCI)	8.47	8.1	9.2	7.9	0.524
GDP(Rs Crore)	597031	404361	2165150	48966	608953
<b>Southern region</b>					
Demo. Index.(DCI)	8.47	8.1	9.2	7.9	0.524
GDP(Rs Crore)	298540	202181	1082570	24483	304495
<b>Aggregate</b>					
Demo. Index.(DCI)	8.47	8.1	9.2	7.9	0.524
GDP(Rs Crore)	15,93,980	13,49,530	34,58,730	6,41,921	836849

**Source: Own estimate.**

Initially, we have tried the regression of GDP Growth on Democratic Index and vice versa , get positive relationship bidirectionally and the results are highly significant.The regression results in

table-2 shows that during the entire time period ,economic growth via GDP growth positively affects democracy and similarly, democracy sets peaceful environment congenial for economic growth signifying that large improvement in democratic environment are beneficial to growth although some erratic negative trends set in during the pre-reform period both at regional level and aggregate level. During the pre reform period(1980-81 to1991-92), democracy clearly constrained growth or vice versa in general which might be mainly due to the fact that societal groups demand excessive redistribution or distracts state officials from their pursuit of economic growth.

**Table-2: Regression results showing impact of Democracy and Economic Growth on each other**

Period /Variables	Pre-reform period (1980-81 to 1991-92)				Post-reform period (1991-92 to2009-10)			Entire period (1980-81 to2009-10)		
		Constant(a)	Trend(b)	R <sup>2</sup>	Consta nt(a)	Trend(b)	R <sup>2</sup>	Consta nt (a)	Trend(b)	R <sup>2</sup>
DCI as dependent variable	Eastern Region	-1.32	8.10 (21.98)	0.22	1.15	0.081 (9.28)	0.83	1.56	0.049 (9.60)	0.76
	Western Region	2.15	-0.00596 (-2.01)	0.20	1.055	0.0847 (8.59)	0.81	1.58	0.044 (8.30)	0.71
	North Region	2.17	-0.0073 (-1.63)	0.21	1.83	0.073 (9.13)	0.83	1.59	0.043 (9.55)	0.76
	South Region	2.16	-0.0073 (-1.66)	0.21	1.23	0.073 (9.008)	0.83	1.61	0.043 (9.43)	0.76
	Aggregate	2.16	-0.0063 (-1.36)	0.16	1.016	0.081 (9.12)	0.83	7.57	0.0056 (8.74)	0.79
GDP as dependent variable	Eastern Region	-1.67	0.140 (2.76)	0.22	3.31	-0.255 (-5.28)	0.68	-21.66	15.67 (9.50)	0.76
	Western Region	80.66	-33.37 (-1.59)	0.20	-7.67	9.60 (8.58)	0.81	-21.86	16.02 (8.38)	0.71
	North Region	71.52	-28.86 (-1.64)	0.21	-11.15	11.38 (9.03)	0.82	-24.95	17.63 (9.48)	0.76
	South Region	70.83	-28.86 (-1.64)	0.21	-11.85	11.38 (9.05)	0.83	-25.65	17.63 (9.48)	0.76
	Aggregate	76.00	-30.60 (-1.56)	0.20	-8.04	10.27 (9.12)	0.83	-21.42	16.33 (8.99)	0.74

**Source: own estimates.**

Unit root test:

The ADF test for unit root was conducted for the variables in the model. The objective of unit root test is to test empirically whether a series contains a unit root .If the series contains a unit root, it means that the series is non-stationary; otherwise the series will be categorized as stationary. Generally, Augmented Dickey-Fuller test is conducted to test the presence of unit root. Before implementing all the tests, economic growth and democracy have been converted into their logarithmic form to capture the rate of change.

The Unit Root test at levels and first differences are presented in table 3. Accordingly, the null hypothesis is that there is a unit root in each variable and each variable is not stationary. Generally, the rule of thumb is that the null hypothesis of unit root should be accepted if ADF statistic is less negative, i.e greater than the critical value. The results in table 3 shows that results are non stationary at their levels since the ADF test results fail to reject the null hypothesis. The test statistics for stationarity of Democracy variable are 5.02, 0.880, -2.41 without constant, with constant and with constant and trend, with their respective p values 1.00, 0.9953 and 0.3705. Similar is the case in case of GDP Growth variables.

This is also confirmed by the value of Mackinnon associated one sided P values in each variable. Therefore, a further test for unit root using the first difference was conducted to determine the order of integration of the time series. The results indicate that the first difference of the variables are on a stationary process and hence both real GDP and DCI are integrated of order 1 i.e I(1). Therefore, nonstationarity can not be rejected at 5% or 10% level of significance.

**Table: 3 Unit Root Test for Stationarity**

Country	Variable	Augmented Dickey Fuller Test			
		Test statistic			
		Observations	Without constant	With constant	With constant and trend
Indian Democratic Republic	<u>Democracy Levels</u>	30	5.02(1)	0.880(0.9953)	-2.41(0.3705)
	First diff	29	-3.57(0.0098)*	-4.62(0.00012)	-4.79(0.00045)
	<u>Economic growth Levels</u>	30	3.05(0.999)	2.587(1)	0.856(0.9998)
	First diff	29	-3.27(0.0059)	-3.32(0.0062)	-4.53(0.0032)

**Software used: Gretl**

**# Both real GDP and DCI are integrated of order 1 i.e I(1) for all three alternatives.**

**\* Figures in the parenthesis indicates asymptotic p-value .**

The next step was determining an appropriate number of lags to be used in estimation, since the choice of lag length is crucial in the Johansen procedure. Table 4 below reports the appropriate lag length selected in accordance with Akaike Information Criterion (AIC), Schwarz information criterion (BIC) and Hannan-Quinn information criterion (HQC). As reported in Table 4, while Akaike Information Criterion (AIC) and Hannan-Quinn information criterion (HQC) suggest that the appropriate lag length for the model is “2”, Schwarz information criterion (BIC), on the other hand, suggests that the appropriate lag length is “1”. In addition to the above-mentioned procedures, we also applied a number of diagnostic tests to the residuals of the model. We employed the Jarque- Bera normality test to make sure that none of these violated the standard assumptions of the model. When the number of lag length was decided to be “1”, it was detected that there would be deviations from normality and stability. Thus, lag length was determined as “2” which appeared to be more conducive to our model.

**Table :4 Selection of appropriate lag length**

Lags	loglik	p(LR)	AIC	BIC	HQC
1	-395.14299		21.112789	21.371355*	21.204785
2	-389.49217	0.02338	21.025904*	21.456848	21.179230*

**Software used: Gretl**

VAR system, maximum lag order 2. The asterisks above indicate the best (that is, minimized) values of the respective information criteria, AIC = Akaike criterion, BIC = Schwartz Bayesian criterion and HQC = Hannan-Quinn criterion.

To test normality, we checked the skewness and the kurtosis of the model. We employed the Jarque-Bera test as a check. The residuals of the variables, as can be seen from Table 5, in the model were characterized by skewness -0.187 and 0.584; kurtosis 0.498 and -0.731; the Jarque-Bera test statistics are 3.13 and 2.66 with probability 0.2086 and 0.2636 for DCI and GDP respectively. Therefore, normality conditions in our model were satisfied and it did not reject the null hypothesis of normality.

**Table:5 -Normality test**

Component	skewness	kurtosis	Jarque-Bera test	
			Test statistics	P value
DCI	-0.187	0.498	3.1338	0.208691
GDP	-0.584	-0.731	2.66686	0.263572

**Software used: Gretl**

Test for co integration:

Now, Johansen's cointegration test is adopted to examine whether the two variables-GDP and DCI are cointegrated or not. In table 6, trace test confirms that there exists one cointegration relation between GDP and DCI for the entire economy. The relationship also confirms that in the long run, DCI has a significant impact on GDP Growth. The evidence of co integration indicates that prevalence of democracy will influence economic growth when it is included in a package of variables. When cointegration exists, Eagle –Granger theorem establishes the encompassing power of ECM over other forms of dynamic specifications.

The tight linkage between co integration and error correction model stems from the Granger representation theorem. According to this theorem, two or more integrated time series that are

cointegrated have an error correction representation and two or more time series that are error correcting are cointegrated (Eagle and Granger,1987). An error-correction model is a dynamic model in which "the movement of the variables in any periods is related to the previous period's gap from long-run equilibrium."

**Table 6: Johansen Co integration test**

Rank	Eigenvalue	Trace test	p-value	Lmax test	p-value	Hypothesized No of CE(s)
0	0.24066	15.774	[0.0438]	10.737	[0.0789]	None*
1	0.12116	5.0371	[0.5248]	5.0371	[0.5248]	At most 1

**\*significantly different from zero indicating rejection of null hypothesis at 5%level of significance.**

To test the existence of co-integration between our targeted variables that either it is survive or not, we assume null hypothesis that there exists no co-integration between variables. According to test results in table6, the p values of trace and maximum Eigen statistics are 0.0438( $p < 0.05$ ) and 0.0789( $p < 0.10$ ) respectively. Thus, the null hypothesis that there are no cointegrating equations can be denied. Trace and maximum Eigen value tests jointly illustrate that there is at most one cointegrating equation when the significance level is 5% and 10% respectively.Hence we reject our null hypothesis in the favor of alternative hypothesis and conclude that there is existence of co-integration between our focused variables.

**Table 7:Long-run Matrix (alpha \* beta')**

	LnDEMO	LnGDP
LnDEMO	-0.41429	0.049043
LnGDP	0.45374	-0.030899

The normalized long run matrix in table 6 shows that there is a positive correlation on a long run relationship between GDP growth and democracy.

The error correction method is preferred method for estimation when two integrated time series are statistically related or cointegrated since the error correction model can be formally derived from the properties of integrated time series. The error correction model is particularly powerful since it allows an analyst to estimate both short run and long run effects of explanatory time

series variables .In this study, error correction model (ECM) is estimated to determine the direction of casuality between GDP growth and democracy.

**Table: 8 Vector Error Correction Model (VECM system, lag order 2)**

	d_LnDEMO	d_LnGDP
d_LnDEMO_1	-0.437483	0.185985
d_LnGDP_1	0.0284674	-0.391731
d_LnDEMO_2	-0.190683	0.286744
d_LnGDP_2	-0.0175673	-0.220909
ECT <sub>(-1)</sub>	-0.0098177	-0.090327

The coefficients of ECT (-1) contribute the adjustment of GROWTH and DEMO for long-run equilibrium between economic growth and democracy. According to Table 8, the coefficient of the error correction term is negative and statistically significant. In the event of a one-unit deviation from long-run GDP growth, there is a correction of approximately 0.98% in the subsequent time period.

From the result, it appears that the error correction terms in both equations are well defined, that is their associated coefficients are negative and statistically significant at 5% levels, which indicate a feedback of approximately 0.98 percent (for DEMO equation) of the previous year’s disequilibrium and a feed back of approximately 9.03 per cent (for the GDP equation) of then previous year’s disequilibrium. The speed with which the model converges to equilibrium is shown by the ECM coefficients. The equation of interest in this study is the GDP equation. The results show that the coefficient of ECM (-1) is -0.0903. It is properly signed and highly significant indicating that the adjustment is in the right direction to restore the long-run relationship. The magnitude of the ECM (-1) is lower in the DEMO equation (-0.0098) than in the GDP equation, this indicates that the speed of adjustment is quite low in the DEMO equation.

The coefficient of ECM is the error correction or disequilibrium correction – coefficient. If the ECM coefficient is greater than zero, it means there is a “surplus” of the dependent variable; a reduction is therefore required to restore equilibrium. But if otherwise as in Table 8, increase is required through the independent variable (Patterson, K. 2000) .The significance of ECM also supports the conclusion of co-integration.

## **7. Conclusion**

This study investigates whether there is a relationship between economic growth and democracy in long run. To put it in a more stimulating way, we investigated the linkage between political and economic parameters. Considering the data covering the period 1980-81 to 2009-10, our statistical investigation confirms that democracy affects economic growth positively and vice versa both at regional level as well as aggregate level while considering the entire time frame in a unified snapshot although some indiscriminate negative trend is noticed during pre-reform period where democracy affect economic growth negatively and vice versa .Consistent with expectation,it has been found that democracy has positive influence on long run economic growth during the entire period. Our statistical analysis based on Johansen co-integration estimation methodology also suggests that there exists a significant, relationship between democracy and economic growth. In other words, this analysis shows that economic growth and democracy are co-integrated. Hence, our analysis lends support to the proposition that democracy is an important indicator for economic development in India and there is long run equilibrium between these two variables. This finding also hints that there might be a causality relationship between these two variables. Our findings lend support to the view that growth on an average is more or less stable under democratic regime and there exist bidirectional causality between two.The dynamic relationship estimated in the study indicates that intensified democracy may result in faster growth and on the other hand, economic prosperity makes democratization easier. Future studies may examine the causal direction of these two traits as well as adding other factors besides democracy that have possible impacts on economic development for India.

The results of this study might be a superior orientation for upcoming studies on the nexus between democracy and economic growth. However, it has following restrictions. First, qualitative aspect of data collection by Survey method regarding formation of democracy index ( DCI) and subsequently quantifying it by ourselves may bias the result , thus uniformity of data might be questionable. Second, in short time-series of 30 annual observations from 1980-81 to 2009-10, though acceptable for statistical analysis, the problem of degree of freedom may depict apprehension. Third, in order to pose a generalized conclusion, the study should have required to include more democratic countries into the empirical framework.

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**Annexture table:1**  
**Classification of Region**

Region	Provinces										
Eastern	West Bengal	Bihar	Orissa	Assam	Jhar khand	Tripura	Meghalaya	Naga land	Manipur	Aruna chal	Sikkim
Western	Gujarat	Rajsthan	Madhya Pradesh	Maha rastra	Chattris gar	-	-	-	-	-	-
Northern	UP	Haryana	Punjab	Delhi	Uttara khand	HP	JK	Chandi gar	-	-	-
Southern	Andhra	Tamil nadu	Karnataka	Kerala	Goa	Pandi cheri	Andaman	-	-	-	-