

Econometric Analysis of Growth Inclusiveness in India: Evidence from Cross-Sectional Data



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Abstract Development economics witnessed several paradigm shifts, and these shifts happened over a period of time. The current shift from pro-poor growth to inclusive growth is dominating the contemporary economic discourse across the world. Broad-based growth can enhance the accessibility of poor to the newly created economic opportunities sharply different from the concept of pro-poor growth which has transferred the benefits of growth to the poor. Economists called this—“alternate growth strategy”—as inclusive growth. This marked a paradigm shift in development economics in recent times. Though there are few cross-country studies which compared the inclusive growth outcomes across different countries, there is little evidence of detailed investigation within a particular country. Further, the existing literature does not offer ways and means through which the inclusive growth outcome can be measured. It has, thus, remained an unresolved issue. The evolution of inclusive growth debate in the last couple of decades brought new challenges like the inconclusive definition of the term inclusive growth, complexities in the identification of the key drivers of inclusive growth, lack of systematic approach for construction of inclusive growth framework and lack of measurement of inclusive growth. With the above backdrop, this study endeavours to explore the multidimensional aspects of inclusive growth in the Indian context. An empirical verification of growth inclusiveness has been studied using multiple regression analysis with cross-sectional data for the years 2001 and 2011 for 15 major Indian states incorporating 20 socio-economic variables. The result shows that a number of macro-economic variables are the drivers of inclusive growth. These include monthly per capita consumption expenditure, employment, poverty, per capita electricity consumption, life expectancy, infant mortality rate, access to bank, share of women in total employment, share of girls in school education and the share of own tax to state GDP and have empirical significance in explaining growth inclusiveness in the Indian context.

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The world has witnessed several shifts in development economics during the pace of economic growth and economic development which attracted the attention of global researchers to arrive at different growth strategies to guide the development agenda for many underdeveloped and developing economies including India. The current shift from pro-poor growth to inclusive growth is redefining the development agenda and policy responses from different countries which are at different stages of economic growth and development. While pro-poor growth strongly advocated the trickle-down effect of economic growth, inclusive growth mandate not only propagated the creation of new economic opportunities but also making the poor to participate in the growth process. The collapse of Washington Consensus (WC) ended the debate of pro-poor growth and culminated in the drafting of Millennium Development Goals (MDGs) by United Nations (2000) with the promise of reducing poverty to half by 2015. Many countries were given specific targets to achieve the MDGs. However, poverty and inequality continue to plague many countries including the fast-growing economies of India and China. If the poor get benefits but do not participate in the growth process, it will widen the inequality. Therefore, the policy makers should focus on reducing the inequality. This triggered new discourse on the need of broad-based growth, creating economic opportunities which can reduce the poverty and increase the capabilities of the poor and enhance their employability skill resulting in productive employment. Broad-based growth can enhance the accessibility of poor to the newly created economic opportunities sharply different from the concept of pro-poor growth which has transferred the benefits of growth to the poor. Economists called this—“alternate growth strategy”—as inclusive growth. This marked a paradigm shift in development economics in recent times. Though there are few cross-country studies which compared the inclusive growth outcomes across different countries, there is little evidence of detailed investigation within a particular country.

The Problem

The existing literature does not offer ways and means through which the inclusive growth outcome can be measured. It has, thus, remained an unresolved issue. There is adequate literature evidence about the shift in development economics from pro-poor growth to inclusive growth particularly in the developing countries like India, China, Brazil and South Africa, and these countries today are the drivers of global economic growth. However, there is a lack of theory building in the conceptual framework of inclusive growth, which gives enough scope for detailed investigation. The evolution of inclusive growth debate in the last couple of decades brought new challenges like the inconclusive definition of the term inclusive growth, complexities in the identification of the key drivers of inclusive growth, lack of systematic approach for construction of inclusive growth framework and lack of measurement

of inclusive growth. With the above backdrop, this paper endeavours to explore the multidimensional aspects of inclusive growth in the Indian context. This paper is organized into four sections. Section 1 deals with the comprehensive review of the existing literature. This is followed by Sect. 2 which deals with the methodology adopted for the study. Section 3 deals with the result and discussion, and finally, Sect. 4 deals with concluding observations.

1 Review of the Literature

1.1 *The Pre-Washington Consensus (PWC)*

This period refers to the late 1960s and the 1970s when the developing countries considered the Soviet and Chinese model of development as an alternative to modernization. The advocates of this development strategy argued for government intervention through large public investment in the key sectors. Lack of capital was perceived as the biggest impediment to development during this period. Rostow's (1962) five stages of economic growth argued for government coordination through public investment. A big push approach was advocated by Rosenstein-Rodan (1943) to deliver economic growth, employment creation, macro-economic stability and a sustainable balance of payment to reduce poverty through trickle-down process. The main reason why poor continue to remain poor is a lack of capital which includes machinery, infrastructure and money. Under these circumstances, development was considered as a process of systematic transformation through modernization and industrialization (Filho 2010).

1.2 *The Washington Consensus (WC)*

This period emerged in the late 1970s and early 1980s. This was a period when economists viewed market openness as solutions to the problems created by unnecessary state intervention in the development process. WC strongly believed that the state was inefficient and, therefore, should be replaced by the efficient market. It has laid the foundation for a strong commitment to the free market and the presumption of government intervention as both inefficient and corrupt, not least through rent seeking (Krueger 1974). It has in fact questioned the misguided policies of the state. It strongly advocated globalization in the developing countries and encouraged World Bank and International Monetary Fund to enforce reforms through structural adjustments and conditionalities imposed on poor countries facing balance of payment disequilibrium (Filho 2010). The development process in the 1980s is very often termed as "lost decade" due to the failure of WC.

1.3 Sustainable Development

The idea of sustainable development was introduced by Brundtland Commission (1987) and popularized by World Bank and United Nation Environment Programme. It has brought the environmental dimension in development thinking on international and national strategies for growth and development. Among the multiple definitions, the ideal one was expressed by World Commission (1987)—sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is “environmentally responsible” and “environmentally friendly”, development that takes present and future considerations with short-term and long-term objectives. Those who enjoy the fruits of economic development should not make future generations worse off by excessively degrading the exhaustible resources and polluting the ecology and environment of the earth. Development should not be limited to growth alone. Rather, it should stand for broader goals of social transformation. The valuing environment is a fundamental step in the direction of stopping damages to the environment. The government should devise regulations and incentives that are required to force the recognition of environmental values in decision-making. Environmental impact assessment is indispensable to nullify the adverse implications of negative externalities produced by fast economic growth.

Meadows et al. (1972) outlined the limits to growth in a report for the Club of Rome’s projects on the predicament of mankind. Their study viewed that if the present growth trends in world population, industrialization, pollution, food production and resource depletion continue unchanged, the limits to growth on this planet will be reached sooner than expected. It is possible to change the pattern of these growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future needs to be incorporated.

1.4 Human Development

The human cost of structural adjustment programmes in the 1980s undertaken in many developing countries under the directions of World Bank and IMF had been extremely harsh. These programmes prompted questions about the human face of adjustment and about whether alternative policy options were available to balance financial budgets while protecting the interest of weakest and most vulnerable sections of the society. The negative externalities of fast economic growth reminded policy makers about the diseconomies of conventional economic growth models.

At this point of time, Mahbub Ul Haq (1995) presented the idea of preparing an annual human development report to the UNDP. Thus came the first Human Development Report. In the year 1990, UNDP published its first Human Development Report (UNDP 1990) with its newly devised Human Development Index (HDI). The main reason for this paradigm shift to human development can be traced to the wrong pic-

ture given by income-based measurement of national progress. Economists, finally, agreed that income cannot be the sole determinant of the progress of the people though it is a dominant one. The first HDR was published on 24 May 1990 in London which addressed some of these issues and explored the relationship between economic growth and human development. Along with per capita income, it also considered health and education in the ranking of countries.

It was a path-breaking moment in development economics since it had challenged the conventional wisdom and reached some important policy conclusions that have redefined development economics subsequently. The human development approach has profoundly influenced the policy makers across the world.

1.5 The Post-Washington Consensus (Post-WC)

Mostly, this period refers to the 1990s. The World Bank scrutinized the WC policies carefully with East Asia's success. The appointment of Joseph Stiglitz as Chief Economist of World Bank promoted the post-WC. Stiglitz et al. (2001) have been the main proponent of new institutional economies. During this period, there was a shift from virtues of the market to institutional settings of economic activity, the significance of market imperfections, the potential outcome of diffusion or changes in institutions, a shift in social inclusion, and distribution of property rights, work pattern, urbanization and family structures. While WC was getting the prices right, the post-WC was getting the institutions right (Filho 2010). There are many factors that contribute to economic stability in the long run such as sound governance, fiscal and debt sustainability, effective institutions, efficient labour market, well-functioning legal system and efficient financial sector (Krueger 2004).

1.6 The Pro-poor Growth (PPG)

The mainstream was compelled to admit that poverty has to be addressed directly through a dedicated set of socio-economic policy tools. Thus, there was a definite shift in the discourse of development economics. The focus on policy reform rather than on growth at any cost contributed to downplaying the trade-off and trickle-down views (Kanbur 2000). There were two distinctive definitions of pro-poor growth (PPG) which are commonly found in the literature. For Kakwani and Pernia (2000), pro-poor growth (PPG) is defined by the increase in the income share of poor people which means that the income of the poor should grow faster than that of non-poor which can ultimately reduce the poverty rate faster than if the income of all the people grows at the same rate. Contrary to this view, Ravallion (2004) focused on the absolute improvement of the living standards of the poor, regardless of changes in inequality. Typically, Ravallion (2004) stressed the pro-poor implications of growth. While Kakwani and Pernia rejected Ravallion's definition of pro-poor growth (PPG),

Ravallion criticized Kakwani and Pernia for the inconsistency of their definition of pro-poor growth (PPG). Three potential sources of pro-poor growth (PPG) were identified by Kraay (2004)—a high rate of growth of average income, a high sensitivity of poverty to growth in average income and a poverty-reducing pattern of growth in relative incomes. In such cases, equity remains only as a tool which may be used to enhance the poverty-alleviating impact of a given set of economic policies. However, poverty reduction can be traced to faster economic growth rather than as an outcome of poverty eradication policies (Filho 2010).

1.7 Millennium Development Goals (MDGs)

In September 2000, leaders of 189 countries met at the United Nations in New York and endorsed the most significant policy initiation—Millennium Declaration, a commitment to work together to build a safer, more prosperous and equitable world. The declaration was translated into a roadmap setting out eight time-bound and measurable goals to be reached by the year 2015, known as the Millennium Development Goals (MDGs) (United Nations 2000). This vision has remained as an overarching development framework of world countries for the past 15 years.

1.8 Inclusive Growth

The debates and discourses on inclusive growth gained momentum in the early 2000s with development thinkers like Kakwani and Pernia (2000), Prahlad (2004), Ali (2007), Ali and Son (2007) exploring alternative development strategy to pro-poor growth (PPG) in development economies. They profoundly argued that pro-poor growth is not sufficient to face the challenges posed by the fast growth global economies like continuing poverty, widespread inequalities and unemployment. They argued that the policy maker should not focus only on sharing the growth benefits to the poor but should also make the poor to participate in the growth process and ensure equal access to the economic opportunities to all, particularly to the poor. United Nations Development Programme (UNDP) has set up an exclusive centre—International Policy Centre for Inclusive Growth (IPC-IG). This shift from pro-poor growth to inclusive growth can be traced to the evidences from the existing literature as given below.

According to Ali (2007), the key drivers of inclusive growth are employment and productivity, improvement in human capabilities and fostering social safety nets. He argued for accelerated inclusive economic growth that leads to significant poverty reduction. Ali and Son (2007) argued that inclusive growth should increase the social opportunity function by increasing the average opportunities available to the people in general and to the poor in particular. The concept of productive employment as a fundamental element in inclusive growth was stressed by Bhalla (2007). According

to Ali and Zhuang (2007), high and sustainable growth which can cause productive employment opportunities will lead to social inclusion. World Bank (2009) stressed that inclusive growth is about raising the pace of growth and enlarging the size of the economy while levelling the playing field for investment and increasing productive employment. Therefore, its focus is on creating sustainable productive employment rather than income redistribution.

Klasen (2010) pointed out that inclusive growth has become a strategic pillar for guiding the policies of Asian Development Bank in its operational strategy. McKinley (2010) identifies that inclusive growth calls for achieving sustainable growth that will create and expand economic opportunities and ensure broader access to these opportunities to all the members of society who participate in and benefit from growth. In reviewing the ADB literature, Raunier and Kanbur (2010a) point out that while there is no consensus on the common definition of inclusive growth or inclusive development, it is very often accompanied by lower income inequality so that the increment of income accrues disproportionately to those with lower incomes (Raunier and Kanbur 2010b). Inclusiveness of growth is the growth elasticity of poverty in the sense that poverty reduction is the overall objective of any policy debate over a period of time (Hann and Thorat 2013). Both income growth and income distribution are equally important for fostering inclusive growth. We need to address the important determinants of inclusive growth. Macro-economic stability, human capital and structural changes are found to be the key determinants of inclusive growth (Anand et al. 2013). Government can calibrate either their spending programmes or their revenue sources to promote inclusive growth or both. (Asian Development Bank 2014a). It also advocated the Nordic model which features extensive fiscal interventions in labour markets while allowing strong labour unions. This model adopted a high level of spending and a mix of taxes (Asian Development Bank 2014b). Robust economic growth is essential for the rapid revenue growth to expand the fiscal space so that governments can focus on developmental spending in the social sector to foster inclusive growth (Anand et al. 2014).

2 Methodology

2.1 *Framework of Analysis*

Multiple regression analysis is used to identify the empirical significance of the selected variables. The selected variables are grouped under six dimensions of inclusive growth—economic, amenities, human development, gender equity and financial inclusion (GEFI), sustainability and governance.

2.2 Estimation Procedure and the Predictive Role of Independent Variables

Procedure for multiple regression has been followed to arrive at the results with the help of E-Views 8 software. The procedure also checked the econometric tests of heteroskedasticity and normality in all the six dimensions of inclusive growth, both for 2001 and 2011. A brief profile of these variables is given below.

1. Economic growth

High real GDP per capita growth alone cannot trigger inclusive growth. However, researchers very often use the per capita income as the indicator. It must be kept in mind that per capita income will not show the qualitative change in the standard of living of the people. The monthly per capita consumption expenditure can be a better indicator which can show the increase in the people's consumption expenditure with the change in the standard of living of the people (Government of India 2013).

2. Employment

Employment generation is one of the macro-economic objectives, and therefore, the cornerstone of inclusive growth theoretical model is the capacity of the economy to generate productive employment to the people (World Bank 2009).

3. Poverty reduction

The ultimate objective of inclusive economic growth is poverty reduction. The Tendulkar Committee report has a concept of inclusive growth (Government of India 2009).

4. Inequality reduction

Inequality reduction is an important objective of macro-economic management. Therefore, inequality reduction is an integral part of the theoretical model for inclusive growth. Measures are needed to reduce the income inequality which will have a positive bearing on the inclusive economic growth (McKinley 2010).

5. Human development

We need to focus on enhancing the human capabilities of the people which can increase the productivity of the people. Macro-economic stability, human capital and structural changes are found to be the key determinants of inclusive growth in the emerging world (Anand et al. 2013). A positive relationship between human development and economic growth exists on both directions. The two-way causality between economic growth and human development is influenced by several factors.

6. **Gender equity**

Many governments across the world have initiated various programmes for achieving the gender equity. Gender equity can foster inclusive growth (McKinley 2010).

7. **Basic socio-economic infrastructure**

Access to safe drinking water, electricity, housing, toilet and transport empowers the capacity of the people to actively participate in the process of economic development.

8. **Financial inclusion**

Financial inclusion is an integral part of the theoretical model for inclusive growth. Ensuring access to financial services and adequate credit is essential for financial inclusion (Rangarajan 2008). Financial sector contributes significantly to inclusive growth due to its impact on growth and income distribution. Financial outcomes influence economic growth and inequality. Better reforms in the financial sector will foster inclusive growth which has been validated in OECD countries (Boris et al. 2015). Raghuram (2014) stresses the 5Ps required for the financial inclusion: product, place, price, protection and profit.

9. **Sustainability dimension**

Inclusive growth needs sustainable economic growth in the long run. Therefore, there is an urgent need for policy intervention to protect the environment.

10. **Governance**

Appropriate policy changes aimed at reforms can remove the negative shock and can act as a positive shock (Patnaik and Pundit 2016). The government, through pro-active policies, has to make it happen, and this is one of the biggest challenges facing the Indian state (Deshpande 2013). In this study, the share of development expenditure to a total expenditure of the state and the share of own tax to the state domestic product are selected as governance variables (Mundle et al. 2016) to make our analytical framework first of its kind in the Indian context which can fuel future studies as well.

2.3 Data Sets and Data Sources:

This study uses cross-sectional data for two time periods of 2001 and 2011 considering the nature of the census data and data obtained from several rounds of NSSO studies and other sources as given in Table 1.

Table 1 Data sources

| Indicators | Dimension | 2001–02 | 2011–12 |
|---|---------------------------------------|---|---|
| Income—MPCE | Economic | 2004–05—NSSO 60th round | NSSO 68th round July 2011 to June 2012 |
| Poverty | | Planning Commission 2004–05 | Planning Commission 2011–12 |
| Employment | | Census 2001 | NSSO 68th round |
| Inequalities (Gini coefficient) | | Planning Commission | Planning Commission |
| Per capita consumption of electricity | Amenities | Central Electricity Authority, Ministry of Power, GoI | Central Electricity Authority, Ministry of Power, GoI |
| Access to drinking water | | Census 2001 | Census 2011 |
| Access to toilet | | Census 2001 | Census 2011 |
| Pucca houses | | Census 2001 | Census 2011 |
| Transport—road length per 100 sq. km. | | Economic Survey of Maharashtra—2005–06 | Economic Survey of Maharashtra—2012–13 |
| % of women in LWF | Gender equity and financial inclusion | Census 2001 | Census 2011 |
| % of girls in school education | | Census 2001 | Census 2011 |
| % of HH with banking | | Census 2001 | Census 2011 |
| Literacy rate | Human development | Census 2001 | Census 2011 |
| Life expectancy | | Census 2001 | Census 2011 |
| Health—IMR | | SRS Bulletin 2005–06 Home Ministry, GoI | SRS Bulletin Oct. 2012 Home Ministry, GoI |
| % of development expenditure to total expenditure | Governance | Finance Accounts of States and CSO | Finance Accounts of States and CSO |
| % of tax revenue to GSDP | | Finance Accounts of States and CSO | Finance Accounts of States and CSO |
| Crime rate | Sustainability | National Crime Records Bureau, Home Ministry, GoI Report 2001 | National Crime Records Bureau, Home Ministry, GoI Report 2011 |
| Air quality | | Institute for Financial Management and Research (IFMR) | Institute for Financial Management and Research (IFMR) |

2.4 Variables and Their Notations

The different variables, notations and expected sign identified for the analysis are given in Table 2.

Table 2 List of explanatory variables, notations and expected sign

| Dimensions | Independent variables | Dependent variable | Notations | Expected sign |
|---------------------------------------|--|------------------------------------|-----------|---------------|
| Economic | Poverty | Per capita income (PCI) | POV | Negative |
| | Employment | | EMP | Positive |
| | Gini (rural) | | GINIR | Negative |
| | Gini (urban) | | GINIU | Negative |
| Amenities | Per capita electricity consumption | Per capita income (PCI) | PCEC | Positive |
| | Access to drinking water | | DW | Positive |
| | Access to pucca houses | | PHOU | Positive |
| | Access to road | | ROAD | Positive |
| Human development | Literacy rate | Per capita income (PCI) | LIT | Positive |
| | Life expectancy | | LE | Positive |
| Gender equity and financial inclusion | Access to bank | Per capita income (PCI) | Bank | Positive |
| | Women employment | | WE | Positive |
| | Girl's school education | | GSE | Positive |
| Sustainability | Air quality (environmental dimension) | Environment sustainability index | AQ | Positive |
| | Crime rate (social dimension) | | CR | Negative |
| Governance | Development expenditure to total expenditure | Governance performance index (GPI) | DE | Positive |
| | Share of own tax to GSDP | | TAX | Positive |

2.5 Model Specifications Six Models Have Been Framed as Given Below, Both for 2001 and 2011

Table 3 Model specifications

| Dimension/indicators | 2001 | 2011 |
|---------------------------------------|--|--|
| Economics | $Y^* = \alpha + \beta_1 \text{Emp} + \beta_2 \text{Pov} + \beta_3 \text{MPCE} + \beta_4 \text{GINIR} + \beta_5 \text{GINIU} + u$ | $Y = \alpha + \beta_1 \text{Emp} + \beta_2 \text{Pov} + \beta_3 \text{MPCE} + \beta_4 \text{GINIR} + \beta_5 \text{GINIU} + u$ |
| Amenities | $Y^* = \alpha + \beta_1 \text{PCEC} + \beta_2 \text{DW} + \beta_3 \text{PHOU} + \beta_4 \text{Road} + \beta_5 \text{Toilet} + u$ | $Y^* = \alpha + \beta_1 \text{PCEC} + \beta_2 \text{DW} + \beta_3 \text{PHOU} + \beta_4 \text{Road} + \beta_5 \text{Toilet} + u$ |
| Human development | $Y^* = \alpha + \beta_1 \text{Lit} + \beta_2 \text{EL} + \beta_3 \text{IMR} + u$ | $Y^* = \alpha + \beta_1 \text{Lit} + \beta_2 \text{EL} + \beta_3 \text{IMR} + u$ |
| Gender equity and financial inclusion | $Y^* = \alpha + \beta_1 \text{Bank} + \beta_2 \text{WE} + \beta_3 \text{GSE} + u$ | $Y^* = \alpha + \beta_1 \text{Bank} + \beta_2 \text{WE} + \beta_3 \text{GSE} + u$ |
| Governance | $Y^{**} = \alpha + \beta_1 \text{DE} + \beta_2 \text{Tax} + u$ | $Y = \alpha + \beta_1 \text{DE} + \beta_2 \text{Tax} + u$ |
| Sustainability | $Y^{***} = \alpha + \beta_1 \text{CR} + \beta_2 \text{AQ} + u$ | $Y^{***} = \alpha + \beta_1 \text{CR} + \beta_2 \text{AQ} + u$ |

Y^* is the dependent variable—per capita income which is the proxy variable for inclusive growth.

Y^{**} is the dependent variable—governance performance index score proxy for inclusive growth.

Y^{***} is the dependent variable—environment sustainable index score proxy for inclusive growth.

Note Emp—employment, Pov—poverty, GINIR—Gini rural, GINIU—Gini urban, PCEC—per capita electricity consumption, DW—access to drinking water, PHOU—access to pucca housing, Road—access to road, Bank—access to banking, WE—percentage of women in total labour force, GSE—percentage of girls in school education, DE—percentage of development expenditure on total expenditure, Tax—percentage of own tax to gross state domestic product (GSDP) of the government, CR—crime rate and AQ—air quality.

3 Results and Discussion

3.1 Evaluating the Regression Models

The regression models are evaluated with the following criteria.

1. The R^2 value should be greater than 0.60 (60%) to ensure that the whole model is fitted strongly. It means that all the independent variables jointly influence the dependent variable. **R^2 shows joint significance within the sample and, therefore, cannot talk about what happens in real world.**

2. Most of the independent variables (at least 50%) should be significant. T statistics is used for this purpose, and the p value should be less than 0.05 (5%).
3. The independent variables should be jointly significant to explain the dependent variable. For this, F statistics is used and the prob. value should be less than 0.05 (5%). ***F statistics shows joint significance within population and, therefore, can talk about what happens in real world.**
4. Sign of the coefficient. It should follow either the established economic theory or expectation or intuition. Since there is no established theory on inclusive growth, this study evaluates the coefficient values with expected sign.
5. Managing residuals to attain good regression model. The following diagnostic tests have been conducted.
 - There should not be serial correlation in the residuals—**Breusch–Godfrey serial correlation LM test is conducted, and the observed probability value should be greater than 0.05 for not rejecting the null hypothesis that **there is no serial correlation.**
 - There should not be heteroskedasticity in the residuals—Breusch–Pagan–Godfrey (BPG) is conducted, and the observed probability value should be greater than 0.05 for not rejecting the null hypothesis that **there is no heteroskedasticity in the residuals.**
 - Residuals should be normally distributed—Jarque–Bera statistic is used. The observed probability value should be greater than 0.05 for not rejecting the null hypothesis that **the residuals follow normal distribution.**

*It means that a model can be accepted if F statistics is significant though R^2 value is less.

**Since this study used cross-sectional data, serial correlation LM test is not required. It is required only if the study is based on time series data to check the autocorrelation.

From the above table, it is clear that a number of macro-economic variables are the drivers of inclusive growth. Income (represented by monthly per capita consumption expenditure—MPCE in this study), employment (EMP), poverty (POV), per capita electricity consumption (PCEC), life expectancy (EL), infant mortality rate (IMR), access to bank (BANK), share of women in total employment (WE), share of girls in school education (GSE) and the share of own tax to state GDP have empirical significance in explaining growth inclusiveness in the Indian context. These are separately discussed under different dimensions of inclusive growth as given below.

3.2 Economic Dimension—2001 and 2011

The following observations emerge from Table 4 with respect to “economic dimension”.

- (1) R^2 value is 0.72 and adjusted R^2 value is 0.61 for the year 2001, which show the significance of the overall fit of the model. For the year 2011, the R^2 value is 0.82 and the adjusted R^2 is 0.73 which show the overall significance of the goodness of the fit of the model.
- (2) “F” test shows the combined significance of all the variables such as employment, poverty, Gini rural and Gini urban for the year 2002 and employment, poverty, MPCE, Gini rural and Gini urban for the year 2011.
- (3) The regression coefficients are given in Table 4—the coefficient of poverty, Gini rural and Gini urban show negative sign as expected. This confirms the general belief that higher inclusive growth reduces poverty and inequality. Poverty is having a negative sign and that of other independent variables are positive as expected.
- (4) Among the independent variables, the P value for poverty is significant for the year 2001 and both poverty and MPCE have significant p value for the year 2011 which supports our argument of inclusive growth and should reduce the poverty over a period of time. However, the p value of other independent variable does not show any statistical significance though together they contribute to the changes in the dependent variable.
- (5) The variance of residuals is homoscedastic, and the residuals follow normal distribution as the p values are greater than 0.05 in both years for both the tests as given in Table 4. This shows the goodness of fit of the model specified in Table 3 against economic dimension both for the years 2001 and 2011.

3.3 *Amenities Dimension—2001 and 2011*

- (1) R^2 value is 0.81 and adjusted R^2 value is 0.73 for the year 2001, which show the significance of the overall fit of the model. For the year 2011, the R^2 value is 0.76 and the adjusted R^2 is 0.63 which show the overall significance of the goodness of the fit of the model.
- (2) “F” test shows the combined significance of all the variables together both for 2001 and 2011.
- (3) The regression coefficient of per capita consumption of electricity is significant at p value of 0.003 for the year 2001 and 0.019 for the year 2011.
- (4) Among the independent variables, the P value for per capita electricity consumption is significant for the years 2001 and 2011 with p values of 0.003 and 0.019, respectively, and there is no statistical significance for other independent variables.
- (5) The variance of residuals is homoscedastic, and the residuals follow normal distribution as the p values are greater than 0.05 in both years for both the tests as given in Table 4.

Table 4 Summary of the results in econometric analysis

| Ind. vari | 2001 | | | | | | | | | | 2011 | | | | | | | | | |
|--|---------------------|---------|----------------|-------------------|--------|---------|--------|---------------------|---------|----------------|-------------------|--------|---------|--------|--|--|--|--|--|--|
| | Regression coeff | P value | R ² | Ad R ² | F-Test | HT/BPGT | NT/JBT | Regression coeff | P value | R ² | Ad R ² | F Test | HT/BPGT | NT/JBT | | | | | | |
| POV | -496.827 | 0.0013 | 0.72 | 0.61 | 0.006 | 0.45 | 0.48 | -27.74 | 0.9600 | 0.82 | 0.73 | 0.003 | 0.13 | 0.78 | | | | | | |
| EMP | 212.9137 | 0.400 | | | | | | 1172.45 | 0.0800 | | | | | | | | | | | |
| MPCE | MC | - | | | | | | 26.10 | 0.0024 | | | | | | | | | | | |
| GINIR | -89574.8 | 0.1196 | | | | | | -1250.36 | 0.3999 | | | | | | | | | | | |
| GINIU | -30458.08 | 0.2699 | | | | | | -55383.10 | 0.6051 | | | | | | | | | | | |
| PCEC | 24.06 | 0.003 | 0.81 | 0.73 | 0.001 | 0.67 | 0.61 | 35.67 | 0.0190 | 0.76 | 0.63 | 0.011 | 0.28 | 0.95 | | | | | | |
| PHOU | 4.558 | 0.9589 | | | | | | 329.27 | 0.5080 | | | | | | | | | | | |
| DW | 29.23 | 0.7074 | | | | | | 31.12 | 0.9400 | | | | | | | | | | | |
| ROAD | 16.59 | 0.3067 | | | | | | 42.68 | 0.4990 | | | | | | | | | | | |
| TOILET | MC | - | | | | 0.61 | 0.47 | 220.72 | 0.5043 | 0.68 | 0.60 | 0.003 | 0.08 | 0.77 | | | | | | |
| Lit | 57.6 | 0.71 | 0.69 | 0.60 | 0.003 | | | 280.46 | 0.7800 | | | | | | | | | | | |
| EL | 2203.78 | 0.005 | | | | | | 570.71 | 0.3800 | | | | | | | | | | | |
| IMR | -283.841 | 0.058 | | | | | | -7434.08 | 0.0100 | | | | | | | | | | | |
| BANK | 426.91 | 0.003 | 0.65 | 0.55 | 0.007 | 0.12 | 0.57 | 1209.91 | 0.0440 | 0.44 | 0.29 | 0.080 | 0.18 | 0.78 | | | | | | |
| WE | 328.07 | 0.085 | | | | | | 249.69 | 0.4990 | | | | | | | | | | | |
| GSE | 119.58 | 0.085 | | | | | | 259.86 | 0.1620 | | | | | | | | | | | |
| <i>Dependent variable: environment sustainability index value (proxy for inclusive growth)</i> | | | | | | | | | | | | | | | | | | | | |
| AQ | 21.49 | 0.003 | 0.53 | 0.45 | 0.0105 | 0.38 | 0.66 | 26.45 | 0.002 | 0.56 | 0.48 | 0.007 | 0.72 | 0.56 | | | | | | |
| CR | -0.83 | 0.531 | | | | | | -0.906 | 0.564 | | | | | | | | | | | |
| <i>Dependent variable: governance performance index value (proxy for inclusive growth)</i> | | | | | | | | | | | | | | | | | | | | |
| DE | -0.0017 | 0.68 | 0.51 | 0.43 | 0.0130 | 0.16 | 0.84 | -0.00057 | 0.884 | 0.42 | 0.32 | 0.037 | 0.93 | 0.72 | | | | | | |
| TAX | 0.06 | 0.012 | | | | | | 0.0567 | 0.012 | | | | | | | | | | | |

Note MC: multicollinearity HT/BPGT: heteroskedasticity test/Breusch-Pagan-Godfrey test NT/JBT: normality test/Jarque-Bera test

3.4 Human Development Dimension—2001 and 2011

- (1) R^2 value is 0.69 and adjusted R^2 value is 0.60 for the year 2001, which show the significance of the overall fit of the model. For the year 2011, the R^2 value is 0.68 and the adjusted R^2 is 0.68 which show the overall significance of the goodness of the fit of the model.
- (2) “F” test shows the combined significance of all the variables together both for 2001 and 2011 with probability value of 0.003 for both the years.
- (3) The regression coefficient of the independent variables shows positive sign for literacy rate and expected life and negative sign for infant mortality rate as expected.
- (4) Among the independent variables, the P value for expected life is significant for the year 2001 with p value of 0.005 for the year 2001. The P value of infant mortality rate is significant for the year 2011 with the p value of 0.01.
- (5) The variance of residuals is homoscedastic, and the residuals follow normal distribution as the p values are greater than 0.05 in both years for both the tests as given in Table 4.

3.5 Gender Equity and Financial Inclusion Dimension—2001 and 2011

- (1) R^2 value is 0.65 and adjusted R^2 value is 0.55 for the year 2001, which show the significance of the overall fit of the model. For the year 2011, the R^2 value is 0.44 and the adjusted R^2 is 0.29 which show the overall significance of the goodness of the fit of the model.
- (2) “F” test shows the combined significance of all the variables together both for 2001 and 2011 with probability values of 0.007 and 0.008 for the year 2011.
- (3) The regression coefficient of the independent variables shows positive sign for all the independent variables as expected.
- (4) Among the independent variables, the P value for access to bank is significant for the year 2001 with p values of 0.003 and 0.044 for the year 2011.
- (5) The variance of residuals is homoscedastic, and the residuals follow normal distribution as the p values are greater than 0.05 in both years for both the tests as given in Table 4.

3.6 Sustainability Dimension—2001 and 2011

- (1) R^2 value is 0.53 and adjusted R^2 value is 0.45 for the year 2001, which show the significance of the overall fit of the model. For the year 2011, the R^2 value

is 0.56 and the adjusted R^2 is 0.48 which show the overall significance of the goodness of the fit of the model.

- (2) “F” test shows the combined significance of all the variables together both for 2001 with probability values of 0.01 and 0.007 for the year 2011.
- (3) As given in Table 4, the regression coefficient of the independent variable crime rate shows negative sign and air quality shows positive sign as expected. This shows that for inclusive growth the crime rate has to be reduced and the air quality has to be increased so that both social and environmental aspects of inclusive growth can be assured.
- (4) Among the independent variables, the P value for air quality is 0.003 which is significant while that for crime rate is not significant.
- (5) The variance of residuals is homoscedastic, and the residuals follow normal distribution as the p values are greater than 0.05 in both years for both the tests as given in Table 4.

3.7 Governance Dimension—2001 and 2011

- (1) R^2 value is 0.51 and adjusted R^2 value is 0.43 for the year 2001, which show the significance of the overall fit of the model. For the year 2011, the R^2 value is 0.42 and the adjusted R^2 is 0.32 which show the overall significance of the goodness of the fit of the model, though the value has slightly been reduced.
- (2) “F” test shows the combined significance of all the variables together both for 2001 with probability values of 0.013 and 0.037 for the year 2011.
- (3) The regression coefficient of the independent variables shows negative sign for share of development expenditure to total expenditure since the more inclusive growth the less the need for development expenditure. But the regression output shows positive sign for share of own tax to GSDP as expected since more inclusive growth will increase the taxable capacity of the people.
- (4) Among the independent variables, the P value for share of own tax to GSDP is 0.012 for both 2001 and 2011 which shows significance level while share of development expenditure to total expenditure does not show any significance level.
- (5) The variance of residuals is homoscedastic, and the residuals follow normal distribution as the p values are greater than 0.05 in both years for both the tests as given in Table 4.

4 Concluding Observations

In a nutshell, the following observations emerge from the multiple regression analysis.

- (1) Among the independent variables in economic dimension, poverty reduction is an important consideration in determining whether a particular state has achieved growth inclusiveness or not for the year 2001 and it is monthly per capita consumption expenditure which is an important consideration in determining whether a particular state has achieved growth inclusiveness or not for the year 2011. This is because poverty reduction strategy initiated by the successive governments yielded the desired result. Faster economic growth and more per capita income paved the way for more consumption expenditure. Therefore, the monthly per capita consumption expenditure became a significant variable causing growth inclusiveness.
- (2) Among the independent variables in amenities dimension, the per capita electricity consumption plays a crucial role in determining whether a particular state has achieved growth inclusiveness or not. It is true both for the years 2001 and 2011.
- (3) Among the independent variables in human development, expected life and infant mortality rate play a crucial role in fostering inclusive growth for the year 2001, and in 2011, it is infant mortality rate which plays a crucial role in determining whether a particular state has achieved inclusive growth or not.
- (4) Among the independent variables in gender equity and financial inclusion dimension, access to bank is a very significant variable in determining whether a particular state has achieved growth inclusiveness or not. It is true both for the years 2001 and 2011.
- (5) In sustainability dimension, it is air quality which determines whether a particular state has achieved growth inclusiveness or not. It is true both for the years 2001 and 2011.
- (6) In governance dimension, it is the share of own tax to gross state domestic product (GSDP), which plays a significant role in fostering inclusive growth both for the years 2001 and 2011. There is a rationale here. When a state achieves inclusive growth, the taxable capacity of the people tends to increase which has been established through statistical significance. Development expenditure shows negative coefficient as the more the inclusive growth the less will be the need for development expenditure.
- (7) The procedure also checked the econometric tests for heteroskedasticity and normality in all the six dimensions of inclusive growth, both for 2001 and 2011 and the results found satisfactory as given in Table 4.

It would be of great interest in advancing the debate on inclusive growth and devise more effective inclusive growth policies in the world in general and in India in particular. More grounded theories are necessary for further advancing the debate on inclusive growth. There are few issues which remain unresolved like the relationship between fiscal redistribution and inclusive growth, the impact of monetary policies in general and inflation in particular on inclusive growth, the impact of technological advancement on growth inclusiveness, the relationship between structural reforms and inclusive growth and the impact of labour market reforms on inclusive growth. Future research on inclusive growth can accommodate these variables for further

strengthening the scope of research in this direction. A detailed study of structural transformation can be useful to understand whether a particular growth episode is inclusive or not. A larger study which can accommodate a broader range of indicators based on state-specific need rather than common indicators, drawn from a wider set of household surveys, would help deepen the understanding and measuring of growth inclusiveness.

References

- Ali, I. (2007). Inequality and the imperative for inclusive growth in Asia. *Asian Development Review*, 24(2), 1–16.
- Ali, I., & Son, H. (2007). *Defining and measuring inclusive growth: Asian prescriptions*. ERD Policy brief series No. 48, Asian Development Bank.
- Ali, I., & Zhuang, J. (2007). *Inclusive growth toward a prosperous Asia: Policy implications*. Asian Development Bank ERD Working Paper No. 97.
- Anand, R., Mishra, S., & Peiris, J. S. (2013). *Inclusive growth—Measurement and determinants*. IMF Working Paper 135.
- Anand, R., Tulin, V., & Kumar, N. (2014). *India: Defining and explaining inclusive growth and poverty reduction*. IMF WP 14/63.
- Asian Development Bank. (2014a). *Asian development outlook, 2014: fiscal policy for inclusive growth*. Cornell University ILR School International Publication.
- Asian Development Bank. (2014b). *Fiscal policy and inclusive growth in advanced countries: Their experience and implications for Asia*. Cornell University ILR School International Publication and ADB Working Paper 422.
- Bhalla, S. (2007). Inclusive growth? Focus on employment. *Social Scientist*, 35(7/8), 24–43.
- Brundtland Commission. (1987). *Our common future—Brundtland Report*. United Nation.
- Cournede, B., Denk, O., & Hoeller, P. (2015). *Finance and inclusive growth*. OECD Economic Policy Paper No. 14.
- Deshpande, A. (2013). *Exclusion and inclusive growth*. United Nation Development Programme—UNDP.
- Government of India. (2009). *Report of the Expert Group to Review the Methodology for; Estimation of Poverty*. Planning Commission, New Delhi.
- Government of India. (2013). *Report of the committee for evolving a composite development index of states*. Ministry of Finance, Government of India.
- Haan de, A., & Throat, S. (2013). *Inclusive growth: More than safety nets*. DRC/CRDI SIG, International Development Research Centre, Working Paper-2013/1.
- Kakwani, N., & Pernia, M. E. (2000). What is pro poor growth. *Asian Development Review*, 18(1).
- Kanbur, R. (2000). Income distribution and development. In A. B. Atkinson & F. Bourgingnon (Eds.), *Hand book of income distribution* (Vol. 1). Amsterdam, North Holland.
- Klasen, S. (2010). *Measuring and monitoring inclusive growth: Multiple definitions, open questions, and some constructive proposals*. Asian Development Bank, Sustainable Development Working Paper Series No. 12.
- Kraay, A. (2004). *When is growth pro-poor? Cross country evidence*. International Monetary Fund—IMF Working Paper No. 04/47.
- Krueger, A. (1974). The political economy of the rent seeking society. *American Economic Review*, 64, 291–303.
- Krueger, A. (2004). Meant Well, tried little, failed much: Policy reforms in emerging market economies. <http://www.imf.org/extend/np/speeches/2004/032304a.htm>.
- Martin, R. (2004). *Pro poor growth: A Primer*. World Bank Policy Research Working Paper, 3242.

- McKinley, T. (2010). *Inclusive growth criteria and indicators: An inclusive growth index for diagnosis of country progress*. ADB Sustainable Development WP Series.
- Meadows, H. D., Meadows, L. D., Randers, J., & Behrens, W. W. (1972). *The limits to growth. A report for the club of Rome's project on the predicament of mankind*. New York, USA: Universe Books.
- Mundle, S., Choudhury, S., & Sikdar, S. (2016). *Governance performance of Indian states: 2001–02 and 2011–12*. Working Paper No. 164 m, National Institute of Public Finance and Policy (NIPFP), New Delhi, 03 March, 2016.
- Patnaik, I., & Pundit, M. (2016). *Where is India's growth Headed?* National Institute of Public Finance and Policy, WP No. 159.
- Prahlad, C. K. (2004). *The fortunes at the bottom of the pyramid: Eradicating poverty through profits*. Financial Times/Prentice Hall.
- Raghuram, R. G. (2014). *Finance and opportunity in India 20th Lalit Doshi Memorial Lecture*. Mumbai: Lalit Doshi Memorial Foundation.
- Rangarajan, C. (2008). *Report of the committee on financial inclusion*. Government of India.
- Rauniar, G., & Kanbur, R. (2010). Inclusive Growth and inclusive development: A review and synthesis of Asian development bank literature. *Journal Asian Pacific Economy*, 41(4), 455–469.
- Raunier, G., & Kanbur, R. (2010b). *Inclusive development: Two papers on conceptualization: Application and the ADB perspective*. ADB.
- Rostain Rodan, P. N (1943). Problems of industrialization of Eastern and South Eastern Europe. *Economic Journal*, 53(210/211).
- Rostow, W. W. (1962). *The stages of economic growth: Non communist manifesto*. Cambridge: Cambridge University Press.
- Saad Alfredo, F. (2010). *Growth, poverty and inequality: From Washington consensus to inclusive growth*. Department of Economic and Social Affairs-DESA Working Paper No. 100, United Nations.
- Stiglitz, J. E., & Meier, Gerald M. (2001). *Frontiers of development economics: The future in perspective*. Washington D.C: Oxford University Press. ISSN 9780195215922.
- Ul Haq, M. (1995). *Reflections on human development*. Oxford University Press.
- United Nations. (2000). Resolution adopted by the General Assembly, 55/2, Agenda Item 60(b) United Nations Millennium Declaration, United Nations, New York. <http://undocs.org/A/RES/55/2>.
- United Nations Development Programme-UNDP. (1990). Human Development Report. United Nations Development Programme.
- World Bank. (2009). *What is inclusive growth?* World Bank Note prepared by Elena Ianchovichina (PRMED) and Susanna Landstron (PRMED).
- World Commission. (1987). *World commission on environment and development merged into Brundtland commission*.