

## Measurement and Determinants of Inclusive Growth: A Case Study of Pakistan (1990-2012)

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Equality of opportunity is the core of inclusive growth, and the inclusive growth emphasises to create employment and other development opportunities through rapid and sustained economic growth, and to promote social justice and the equality of sharing of growth results by reducing and eliminating inequality of opportunity. The main objective of the study is to measure the inclusive growth first and then empirically examine its determinants. To measure the inclusive growth, we use the methodology developed by Asian Development Bank using weights and scores of different indicators. We develop a unified measure of inclusive growth, which integrates growth, inequality, accessibility and governance into one single measure. Results show that Pakistan is at satisfactory performance level with respect to its performance in growth inclusiveness. Further results of ARDL show that macroeconomic stability and social financial deepening are important determinants to enhance the inclusiveness, and reduce poverty and inequality, while reforms in trade sector are required to increase their efficiency in terms of inclusiveness.

*JEL Classification:* O4

*Keywords:* Inclusive Growth, Poverty Reduction, Income Inequality, Equity, Accessibility, Social Protection

### INTRODUCTION AND LITERATURE REVIEW

In most of the developing nations policy makers are diverting their attention towards the inclusive growth because of increasing inequality levels. According to Osmani, 2008, “the concept of inclusive growth demands for widespread expansion of opportunities so that all segments of the society can benefit from economic expansion”. The idea of inclusive growth has been commonly explained through the employment, poverty and inequality nexus. As for as Pakistan is concerned, there is a decrease in extreme poverty that is about 60 percent, but still many people are living below the poverty line. The official poverty estimates show a persistent decline since 2001-2002 (see Table). Poverty increased during from 1992-1993 to 2001-02, with the exception of 1996-1997, and then declined sharply by 10.6 percentage points after 2001-2002 through 2004-2005—from 34.5 percent in 2001-2002 to 23.9 percent in 2004-2005. In 2005-2006, a further decline of overall poverty in Pakistan by 1.6 percentage points was officially observed. These rapidly declining estimates became highly controversial and

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the Government of Pakistan stopped formally reporting official estimates after 2006. However, the economic survey of 2013-14 reported estimates of poverty headcount for 2007-2008 and 2010-2011 of 17.2 percent in 2007-08, which meant that the proportion of poor had declined a further 5.1 percent between 2005-06 and 2007-08. A further decline of 4.8 percentage points is observed in the official numbers in 2010-11; when the poverty headcount declined further to 12.4 percent [Pakistan (2014)].

Years	Poverty Headcount
1992-93	25.5
1993-94	28.2
1996-97	25.8
1998-99	30.6
2001-02	34.5
2004-05	23.9
2005-06	22.3
2007-08	17.2
2010-11	12.4

Source: Government of Pakistan 2014.

The prevailing inequalities in Pakistan have resulted in 31.5 percent loss in human development which could have been improved otherwise. The economic indicators show that the most of the poor population have not benefitted from growth. Almost all the developing countries which have the interest in inclusive growth are trying to reduce the inequalities. According to Ali and Son (2007) “Inclusive growth ensures fair and equal access to all stratum of society, including disadvantaged and marginalised, to opportunities created”. Any economy is unable to achieve the sustainable development until all the fruits of the growth are not provided to all segments of the society. In the recent years Pakistan has emphasised on improving education and health sectors for productive labour force.

This paper makes two contributions to the inclusive growth debate. First, the paper develops a unified measure of inclusive growth, which integrates growth, inequality, accessibility and social protection into one single measure, followed by the methodology of Asian Development Bank. To the best of our knowledge, this is the first unified measure of inclusive growth applied in Pakistan. Second, the measure is used to study the determinants of inclusive growth in Pakistan.

In many developing countries Inclusive growth has become an important development policy. In literature there are different definitions and measurement concepts of inclusive growth.

Anand, *et al.* (2013) found that macroeconomic stability, human capital, and structural modification are providing basis for obtaining inclusive growth of emerging markets over three decades. While, Tripathi (2013) study shows that the 54 populated cities of India have lower inclusive growth and poverty but it is attached with rise in inequality from 2004-05 to 2009-10. Ali and Ahmad (2013) co-integration analysis shows inverse influence of growth on income inequality whereas foreign aid, foreign direct investment and labour force participation rate have positive influence on inequality. A vector error correction model result confirms long run causality for Pakistan from 1972–2007, as the coefficient of error correction term is significantly negative.

Asghar and Javed (2012) found that larger education and employment opportunities are inclusive but distributed inequitably over the time period of 1998 to 2008 for Pakistan. While, Thorat and Dubey (2012) explore that few communities are getting more advantages from poverty reduction strategies and inequality negatively influence poverty reduction in urban areas of India.

Rauniyar and Kanbur (2009) found that by improving infrastructure qualities, social benefits for deserving people, advance agriculture technologies for rural population, making business environment feasible for more fruitful investment to endorse equity and inclusiveness. Habito (2009) explores the significant influence of governance, public expenditures in social services, sectoral composition of GDP growth, and contribution of agriculture to GDP growth on the inclusiveness of economic growth. Lanchovichina and Lundstrom (2009) found that poor education and health, access to capital and credit, infrastructure and government failure are the hurdles to inclusive growth in Zambia. Afterwards, Meschi and Vivarelli (2007) suggest that aggregate trade flows are weakly related with income inequality in a sample of 70 developing countries from 1980 to 1999. Study also supports technological differentials between trading partners are important in shaping the distributive effects of trade openness.

### Measurement of Inclusive Growth

Following the methodology developed by Asian Development Bank [Terry McKinley (2010)] building of inclusive growth index has the following steps:

*First*, select the dimensions and indicators.

Assume the evaluation dimension collection of inclusive growth index is  $U = \{u_1, u_2, u_3, \dots, u_n\}$  evaluation area collection is  $U = \{u_{j1}, u_{j2}, u_{j3}, \dots, u_{jn}\}$  and evaluation index collection is  $U = \{u_{j11}, u_{j21}, u_{j31}, \dots, u_{jim}\}$  where  $j$  refers to evaluation dimension,  $i$  is evaluation area and  $m$  is evaluation indicator.

*Second*, set target weight.

Weight is the proportion of each indicator in the collection, reflecting the importance of each indicator. Assume the weight is  $W$ ,  $W = \{w_1, w_2, w_3, \dots, w_i\}$

*Third*, conduct univariate standardisation.

After building the evaluation indicators, conduct quantitative evaluation of indicators one by one. After that, we have a matrix  $R$ .

$$U_R = \{r_{111}, r_{112}, \dots, r_{11m}\}$$

*Fourth*, weighted sum to have inclusive growth index (IGI)

$$IGI = \sum_{i=1}^m \left( \sum_{j=1}^n U_R * w_j \right) * W_i$$

Where

$U_R$  Standardised single index score

$w_i$  weight of single indicator at this level

$W_i$  Dimensional layer weight

The overall goal of inclusive growth index is set as 100. The closer to 100 the result is, the higher the degree of inclusiveness of economic growth is.

This indicator system includes both positive indicators and reverse indicators, as well as range indicators. The specific methods for dimensionless vary, shown as follows:

### Method of Positive Indicators

$$V_{y,j} = (X_{y,j}/Z_{y,j}) * 100$$

Where  $V_{y,j}$  is the score of  $j$  index in  $y$  year,  $Z_{y,j}$  is the target value of  $j$  index,  $X_{y,j}$  is the actual value of the  $j$  index.

Reverse will hold for negative indicator.

### Weighting and Scoring

A composite index that is based on a scoring methodology and a weighting scheme implicitly involves value judgments. The composite index is constructed on a weighted average score of 0–10, based on country performance on each of its four components. Each of the four components is, in turn, a weighted average of its subcomponents. In general, a score of 1–3 will be regarded as unsatisfactory progress on inclusive growth, a score of 4–7 as satisfactory progress, and a score of 8–10 as superior progress.

### Weight of Inclusive Growth Index

There are four pillars of inclusive growth (1)Economic Growth, Employment, and Infrastructure (2) Inequality, Poverty and General Equity (3) Accessibility (4) Social Protection and Governance. Weight is the proportion of each indicator in the collection, reflecting the importance of each indicator.

Dimension Index		Area index		Indicators	
Indicators	Weight	Indicators	Weight	Indicators	Weight
Economic Growth, Employment, and Infrastructure (U <sub>1</sub> )	0.30	Economic growth (U <sub>11</sub> )	0.15	GDP per capita growth rate (U <sub>111</sub> )	0.15
		Employment (U <sub>12</sub> )	0.1	Employment in industrial sector (U <sub>121</sub> )	0.05
				Employment in services sector (U <sub>122</sub> )	0.05
		Infrastructure (U <sub>13</sub> )	.05	Energy use (U <sub>131</sub> )	0.05
Inequality, Poverty and General Equity (U <sub>2</sub> )	0.30	Income inequality (U <sub>21</sub> )	0.1	Gini index (U <sub>211</sub> )	0.1
		Poverty (U <sub>22</sub> )	0.1	Poverty headcount ratio at \$2 a day (PPP) (U <sub>221</sub> )	0.1
				Ratio of female to male labourforce participation rate (U <sub>231</sub> )	0.1
		Gender equity (U <sub>23</sub> )	0.1	Primary school enrollment rate (U <sub>311</sub> )	0.07
Accessibility (U <sub>3</sub> )	0.25	Education (U <sub>31</sub> )	.09	Mortality rate, under-5 (U <sub>321</sub> )	0.07
		Health (U <sub>32</sub> )	.09	Improved water source (U <sub>331</sub> )	0.03
		Access to water, sanitation (U <sub>33</sub> )	.07	Improved sanitation facilities(U <sub>332</sub> )	0.03
Governance (U <sub>4</sub> )	0.15	Governance (U <sub>42</sub> )	.15	Government Effectiveness(U <sub>421</sub> )	0.08
				Corruption perception index (U <sub>422</sub> )	0.07

**Data Sources and Description**

Dimension Index Indicators	Area index Indicators	Indicators	Unit	Source	
Economic Growth, Employment, and Infrastructure	Economic growth	GDP per capita growth rate	Annual %	WDI	
		Employment in industrial sector.	% of total employment	WDI	
	Employment	Employment in services sector	% of total employment	WDI	
	Infrastructure	Energy use	kg of oil equivalent per capita	WDI	
Inequality, Poverty and General Equity	Income inequality	Gini index		WIID	
		Poverty headcount ratio at \$2 a day (PPP)	% of population	WDI	
	Poverty	Ratio of female to male labour force participation rate	%	WDI	
		Gender equity	Primary school enrolment rate	% of all eligible children	GE
Accessibility	Health	Mortality rate, under-5	per 1,000 live births	WDI	
		Access to water, sanitation	Improved water source	% of population with access	WDI
		Improved sanitation facilities	% of population with access	WDI	
Governance	Governance	Government Effectiveness	score (-2.5-2.5)	WDI	
		Corruption perception index	score (0-10)	TI	

*WDI*: World Development Indicators.

*WIID*: World Income Inequality Database.

*GE*: The Global Economy.

*SBP*: State Bank of Pakistan.

*WGI*: World Governance Indicators.

*TI*: Transparency International.

In order to make the inclusive growth index we follow the above mentioned methodology and indicators. The estimated inclusive growth index is given below from the year of 1990 to 2012.

Years	Inclusive Growth Index
1990	41.99086607
1991	31.10589917
1992	38.93098023
1993	31.95072188
1994	46.79391174
1995	48.14598354
1996	48.27021251
1997	34.38311549
1998	35.33617878
1999	50.33384011
2000	50.73424768
2001	36.12871625
2002	43.12325203
2003	51.67598125
2004	52.39837594
2005	53.51583759
2006	54.57861248
2007	54.98029639
2008	40.38851806
2009	55.99545687
2010	41.63392123
2011	53.75695377
2012	52.64293172

### Determinants of Inclusive Growth

An analysis is conducted using annual time series data (1990-2012) to determine whether financial development, globalisation and macroeconomic stability have empirical significance in explaining growth inclusiveness. We thus estimate the following equation, Rahul, Saurabh, and Shanak (2013)

$$g_t = \alpha_0 + \alpha_1 FD_t + \alpha_2 TO_t + \alpha_3 \Delta CPI_t + \varepsilon_t$$

The dependent variable measures inclusive growth. The set of independent variables includes the financial development (measured by credit to private sector), globalisation (measured by trade openness) and macroeconomic stability (measured by inflation rate).

### Description and Sources of Variables

Variable	Description
g	Measure of inclusive growth, which integrates growth, inequality, accessibility social protection and stability.
FD	Financial development (measured by credit to private sector as a % of GDP) <i>Source:</i> The Global Economy
TO	Globalisation (measured by trade openness as a % of GDP) <i>Source:</i> World Development Indicators (WDI)
$\Delta CPI$	CPI based inflation (2010=100) <i>Source:</i> World Development Indicators (WDI)

## METHODOLOGY

### Unit Root Test: Augmented Dickey Fuller Test

In order to check the stationarity we use augmented dickey fuller test which is the advanced version of dickey fuller test. If one can reject the null hypothesis that a series possesses a unit root, then the series is stationary at level, or integrated of order zero (I(0)). If one cannot reject the null of a unit root, then the series is difference stationary. We can write the general form of ADF au level and first difference as:

$$\Delta Y_t = \alpha Y_{t-1} + \sum_{i=1}^n \beta \Delta Y_{t-i} + \delta + Y_t + \xi_t$$

$$\Delta \Delta Y = \alpha_1 \Delta Y_{t-1} + \sum_{i=1}^n \beta \Delta \Delta Y_{t-i} + \delta + \gamma_t + \xi_t$$

### ARDL Co-integration

The main advantage of bounds test is that it allows a mixture of I (1) and I (0) variables as regressors, that is, it is not necessary that the order of integration of variables should be same. Therefore, the ARDL technique has the advantage of not requiring a specific identification of the order of the underlying data. We can also use this technique for small or finite sample size [Pesaran, *et al.* (2001)].

The null hypothesis of no co-integrations tested against the alternative by means of the F-test. Pesaran, *et al.* (1996) provides two sets of asymptotic critical values. One set assumes that all variables are I (0) and the other assumes they are all I (1). If the calculated F-statistic is above the upper bound critical value, then we reject the null hypothesis of no co-integration. If it is below the lower bound, then the null cannot be rejected. Finally, if it calculated value is inside the critical value band then the result would be inconclusive. If it is confirmed that there is co- integration then we can estimate long run coefficients and ARDL error correction.

### Descriptive Statistics

Descriptive statistics can be used for the better decision about data reliability. Two important measures are used to check data reliability. One is measure of central tendency and other is the measure of dispersion. Usually mean, median and mode are used as a measure of central tendency and standard deviation, quartile, range and mean deviation are used as a measure of dispersion. Our results show that the mean and median are almost same and there is no evidence of skewness and almost all the variables have low standard deviation which shows low variations and consistency in data.

Variables	Mean	Median	Std. Dev.
FD	23.54783	23.38000	2.147351
G	4.873075	4.814598	0.819452
INF	8.760852	9.083693	3.790116
TO	34.18412	34.01173	2.939877

### Results of Unit Root Test

Null Hypothesis: there is unit root

Variables	Level		1 <sup>st</sup> Difference		Order of Integration
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
g	-3.353121* (-2.715892)	-4.847602* (-3.32418)	-7.576314* (-2.758434)	-6.691587* (-3.374224)	I(0)
	Lag (0)	Lag (0)	Lag (0)	Lag (0)	
FD	-2.637108 (-2.945842)	-2.770642 (-3.54428)	-2.994102* (-2.948404)	-3.831702* (-3.544284)	I(1)
	Lag (1)	Lag (1)	Lag (0)	Lag (0)	
TO	-2.484238 (-2.945842)	-2.601095 (-3.54428)	-6.371947* (-2.948404)	-6.192645* (-3.544284)	I(1)
	Lag (0)	Lag (0)	Lag (0)	Lag (0)	
$\Delta$ CPI	-2.122297 (-2.945842)	-2.095782 (-3.54428)	-5.820432* (-2.94840)	-5.707053* (-3.544284)	I(1)
	Lag (0)	Lag (0)	Lag (0)	Lag (0)	

Note: \*Denotes the rejection of hypothesis at 5 percent level of significance.

For further estimation we now consider the order of integration (or stationary) of each series using the Augmented Dickey Fuller (ADF) unit root tests. The results show that some variables are stationary at level while some are at first difference. So we apply ARDL model which deals with both I(0) and I(1).

**Results of ARDL Test:**

$$\Delta g_t = \beta_0 + \beta_1 g_{(t-1)} + \beta_2 FD_{(t-1)} + \beta_3 TO_{(t-1)} + \beta_4 \Delta CPI_{(t-1)} + \gamma_1 \sum_{i=1}^n \Delta g_{(t-i)} + \gamma_2 \sum_{i=0}^n \Delta FD_{(t-i)} + \gamma_3 \sum_{i=0}^n \Delta TO_{(t-i)} + \gamma_4 \sum_{i=0}^n \Delta \Delta CPI_{(t-i)} + u_t$$

In the above ARDL equation variables in level show the long run relationship whereas variables in differenced form show the short run relationship. For the estimation of the above equation in first step, we choose the lag length of first differenced variables. We take only two lags due to the problem of degree of freedom. We use ordinary least square method to estimate the above equation. On long run coefficients we apply bound test through S coefficient restriction test. We test the null hypothesis of no long run relationship against the alternative.

$$H_0 : \beta_1 = 0, \beta_2 = 0, \beta_3 = 0, \beta_4 = 0$$

$$H_1 : \beta_1 \neq 0, \beta_2 \neq 0, \beta_3 \neq 0, \beta_4 \neq 0$$

**Wald Test:**

<b>Null Hypothesis:</b>	C(2)=0		
	C(3)=0		
	C(4)=0		
	C(5)=0		
<b>F-statistic</b>	<b>3.536812</b>	Probabiliy	0.022561
<b>Chi-square</b>	23.42163	Probabiliy	0.004957

Tabulated value of F-statistics lower bond I(0)=2.62 and upper bond I(1)=3.79 at 5 percent level of significance.

As calculated value of f-statistics is greater than the upper bound critical value so we reject the null hypothesis of no long run relationship against the alternative.

**Estimated Long Run Coefficients**

ARDL(0,1,1,0,1) selected based on R-BAR Squared Criterion

Variable	Coefficient	Std. Error	T-Ratio
C	6.791486	2.087559	3.253314
FD	0.625241	0.229625	2.722876
TO	0.585101	0.248826	2.351448
INF	-0.216720	0.109458	-1.979937

Note: \*shows the significance at S5 percent while \*\* shows significance at 10 percent.



Financial deepening, measured by the credit to private sector, has a positive and very significant impact on inclusiveness which shows the importance of financial deepening for the inclusive growth. Basically the improvements in the financial sector make easy access to loan for investment. In previous findings such as Levine (2005) financial development is positively linked to growth.

Globalisation or international integration, measured by trade openness, plays its role through positive externality. Trade facilitates the adaptation and movement of both workers and firms towards sectors with growing demand, and the incorporation of new technologies with the objective of promoting productivity and employment growth. Globalisation generates a virtuous circle between the reduction of structural differences and growth that improves the wellbeing of a majority and reduces inequality. Our results show that there is positive and significant relation between globalisation and inclusive growth.

Macroeconomic stability is represented by inflation. There is a negative link between inflation and inclusiveness, higher inflation is associated with less poverty reduction, through lower average welfare growth as well as with an adverse contribution to distributional effects. In particular, poor households are usually more affected by food price inflation as they need to spend disproportionately more on food, and substitution possibilities are limited. Therefore, they are generally more affected by inflation, Rahul, Saurabh, and Shanak (2012), Rahul, Saurabh, and Shanak (2013), Rahul, Saurabh, and Shanak (2014), Elena and Macro (2007).

#### Short Run Error Correction Model

$$\Delta g_t = \alpha + \beta_1 \sum_{i=1}^n \Delta g_{(t-i)} + \beta_2 \sum_{i=0}^n \Delta FD_{(t-i)} + \beta_3 \sum_{i=0}^n \Delta TO_{(t-i)} + \beta_4 \sum_{i=0}^n \Delta \Delta CPI_{(t-i)} + \lambda ECM_{t-1} + \varepsilon_t$$

In error correction model, variables in differenced form show the short run relationship and ECM is the error correction term which shows the adjustment from previous period to current period.

Dependent Variable is dg			
Regressor	Coefficient	Standard Error	T-Ratio
ecm(-1)	-0.212570	.10253	-2.07324*

Note: \*shows the significance at 5 percent

The error correction term is negative and significant which means that any exogenous shock in one of the variables will lead to convergence towards the equilibrium. An exogenous shock in the inclusive growth will lead to 21 percent movement towards the original equilibrium every year, thus the equilibrium is stable.

#### CONCLUSION

As the eight development goals of the millennium is reduction in poverty to be achieved by 2015, and this can be achieved if everyone gets one's fair and equal income so that he/she may spend to fulfil their biological needs and improve its living standard.

Inclusive growth that focuses on both creating opportunities rapidly and making them accessible to all including the disadvantaged and the bypassed is a necessary but insufficient condition for reducing inequality outcomes. The main objective of the present study is the measurement of inclusive growth using the methodology developed by Asian Development Bank, which integrates growth, inequality, accessibility, and governance into one single measure. Other objective is to empirically examine the determinants of inclusive growth using annual time series data for Pakistan from 1990-2012. First of all we have measured the inclusive growth using weights and scores for each indicator of inclusive growth. The index shows that Pakistan shows a satisfactory progress in inclusive growth. Second, we use the index to examine the determinants of inclusive growth. We use financial development, globalisation and macroeconomic stability in explaining growth inclusiveness. Results of the ARDL show that financial development increases the inclusive growth and makes easy access to loan for investment. Here globalisation affect the inclusive growth through trade openness, results shows that more globalisation through technology leads to the economies of scale and ultimately increases the inclusive growth. Macroeconomic stability is represented by inflation rate; results show that lower level of inflation increases the purchasing power of the poor and their access to basic needs.

We concluded that better financial system ensuring equity, improvement in the skill level to take benefit from international trade, maintaining macroeconomic stability by stabilising the inflation leads to the inclusive growth.

### **Policy Implications**

Findings of the study lead to following policy implications:

Access to finance by the poor is a prerequisite for poverty reduction and sustainable economic development. This study has established that there is a strong need to strengthen policy approach for financing the priority sector in Pakistan as it has had a positive impact on inclusive growth. In view of the strong relationship between priority sector lending and inclusive growth, it is imperative on the policy makers in general and the governments in particular to make efforts to induce the banks and financial institutions in increasing priority sector lending beyond the stipulations laid down.

As trade positively affect the growth inclusiveness but significant at 10 percent so government should adopt the policy that enable poorer people to compete in a globalised world market by increasing their productivity ensuring that poor people, women and other disadvantaged groups can draw benefits from exports.

Stable macroeconomics is important for economic growth, thus indirectly affecting income inequality. Government need to prevent the occurrence of high inflation.

## **APPENDIX:**

### **Five Pillars of Inclusive Growth**

1. Economic Growth, Employment, and Infrastructure
  - **Growth**
  - GDP per capita growth rate

- **Employment**
  - Employment in industrial sector.
  - Employment in services sector
- **Infrastructure**
  - Energy use
- 2. Inequality, Poverty and General Equity
  - **Inequality**
    - Gini index
  - **Poverty**
    - Poverty headcount ratio at \$2 a day (PPP)
  - **General Equity**
    - Ratio of female to male labour force participation rate
- 3. Accessibility
  - **Education**
    - Primary school enrollment rate
  - **Health**
    - Mortality rate, under-5
  - **Access to water and sanitation**
    - Improved water source
    - Improved sanitation facilities
- 4. Governance
  - Government Effectiveness
  - Corruption perception index

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