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# Developing an Inclusive Growth Index: Socio-Economic Determinants and Macroeconomic Perspectives for Pakistan

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**ABSTRACT**

*This study developed an inclusive growth index and explored the major determinants of inclusive growth in Pakistan. The index for inclusive growth is constructed using principal component analysis utilizing twenty-four different socio-economic variables grouped under seven dimensions of inclusive growth: economic growth, productive employment, infrastructure endowment, human capabilities, income inequality, gender equity, and governance. Empirical estimation was performed using data from 1980 to 2022. The results show that inflation, domestic investment, and foreign direct investment are significant determinants of inclusive growth in Pakistan*

## 1 Introduction

Inclusive growth is one of the most important policy agendas in the development of literature among researchers and practitioners alike. It deals with poverty alleviation, sustained development, and mass inclusion in decision-making, particularly in the excluded group (Asian Development Bank, 2011). It has been argued that economic growth will not be sufficient to generate sustained improvement in welfare if its benefits are shared unequally among the masses.

Developing economies have witnessed widening inequalities due to their rapid economic growth. In Asia, for instance, the Gross Domestic Product (GDP) grew on average at around 7% from 1990-2012. However, this rapid economic growth deepened the inequality between the rich and poor (Kang, 2015). A higher growth rate is necessary for a country's economic progress, but growth alone is not enough to alleviate poverty (Ali & Son, 2007).

The recognition that economic growth can bypass vulnerable sections of society has fueled the debate on making growth more inclusive for all. Unequal benefits reaped from economic growth perpetuate the concentration of wealth in the hands of those who are already well-off. Mohazzam and Atif (2012)

explained inclusive growth as an association between micro- and macro-economic determinants of growth. Inclusiveness stresses that growth is important for poverty reduction, and equality of opportunity, such as access to markets, resources, and an unbiased environment, is necessary for individuals and businesses. Ianchovichina and Lundstorm (2009) argued that growth is inclusive when sustainable over time. The most frequently used definition proposed by the World Bank (2009) is the absolute reduction in poverty created through productive employment, instead of direct income redistribution schemes.

This concept emerged because of a shift in the development discourse, which earlier considered equity an unavoidable consequence of growth. In later works, it was recognized that growth with equity is not only possible but also an influential component of growth (Ranieri & Ramos, 2013; Shepherd et al., 2020). Against this backdrop, inclusive growth has assumed prominence in the development policy discourse.

In Pakistan, economic growth did not bring the fruit of success for all, as it was generally believed that the benefits would trickle down to the lower class. The main reasons for this were market failure and nepotism. World Bank statistics show that over 50% of Pakistan's population currently lives below $2 a day; therefore, if poverty and income inequality are not simultaneously tackled, then growth may not benefit the lowest strata of the population (Ravallion, 2004; Khan et al., 2019).

This study draws attention to policymakers towards pro-poor growth and determinants of inclusive growth using a composite index based on principal component analysis that incorporates income and non-income measures such as education and health status. The study further tests whether standard economic growth variables influence the inclusive growth index by employing multiple regression models.

The remainder of this paper is organized as follows: Section two discusses recent developments in the literature and section three lays the theoretical framework of the study. Section four gives data sources, data description, and empirical methodology. The empirical findings and their discussion are presented in section five and section six concludes.

## 2 Literature Review

A voluminous study is available in the literature on inclusive growth in English and European studies. However, to the best of the authors' knowledge, there are only a few recent and relevant studies available on the given issue in the case of Pakistan (Ghous et al, 2022; Aslam et al, 2021; Asif et al, 2019; Munir and Ullah, 2018; Ali, 2007; Ali and Son, 2007; Anwar, Khan and Khan, 2019; Zulfiqar et al., 2016; Asghar and Javed, 2011; Timazee and Haroon, 2015; Siegmann and Majid, 2021)

Sissons et al. (2019) found that inclusive growth concerns were largely sidelined in English cities. Devolution agreements play an important role in bringing inclusivity to growth (Ayers et al, 2017; Etherington and Jones 2016; Tomaney 2016).

A recent report on sustainable and inclusive growth in the European Union revealed that the benefits of growth need to be distributed more fairly in societies for macroeconomic growth to be more inclusive and on-ground realities. Ali (2007) estimated inclusive growth by social function and revealed that the foundations for achieving inclusive growth are macroeconomic stability and structural change. (Ananad, Mishra and Peiris, 2013; Munir and Ullah, 2018; Ali and Son, 2007; et al., 2022; Ghulam, 2021b, 2021a, 2024; Gul et al., 2022; Huang et al., 2023; Muhammad et al., 2024; Shabeer, 2022; Shabeer et al., 2024a, 2024b; Shabeer & Rasul, 2024b, 2024a; Wang et al., 2023; Zain et al., 2024; Zubair et al., 2024)).

Projects like CPEC and the China-Pakistan Economic Corridor (CPEC) have a widespread impact on inclusive growth in Pakistan, and Asif et al. (2019) reasoned that the impact of CPEC and the trade volume of Pakistan with China tends to encourage inclusive growth in Pakistan. In addition, a study by Osabohien et al. (2021) on Western African countries concluded that agricultural trade positively

affects inclusive growth, whereas foreign direct investment has an insignificant impact on inclusive growth.

Inclusive growth gained prominence in the development literature due to growing concerns that despite rapid growth, economies were rampant with social ills and income inequality. The distinction between pro-poor growth and inclusive growth lies in the non-income dimension and the participatory aspects of inclusive growth.

Despite various contributions towards inclusive growth in the literature, ambiguity remains in terms of measuring inclusive growth and the selection of adequate variables to be used for the measurement of the index. Measuring inclusive growth requires quantification in the growth process, unlike pro-poor growth, which is usually measured with indicators such as the employment-to-population ratio (Ramos et al., 2013) or the share of workers living below the poverty line (Mckinley, 2010), thus making its measurement challenging for researchers (Chou, & Huque 2016).

The ADB measures a cumulative growth index based on weights and growth scores. The Social opportunity function approach developed by Ali and Son (2007) is another tool based on the Opportunity Index (OI) and Equity Index of Opportunity (EIO) for measuring inclusive growth. Finally, Principal Component Analysis (PCA) has been frequently used to construct an index of growth using a multitude of relevant and correlated factors that encapsulate inclusive growth (Mohazzam & Atif, 2012)

The literature highlights innovation, gender equality, education, health and institutions as measures of inclusive growth. Bresson, Etienne, and Mohnen (2015) examined the role of innovation in growth and income distribution using a panel of OECD and non-OECD countries. The authors constructed the Income Equity Index (IEI) and Social Mobility Index (SMI) as proposed by Ali and Son (2007) to support the argument that growth in their panel of OECD countries was, in fact, inclusive, whereas in non-OECD countries, the results were not so favourable. Asongu & Kodila-Tedika (2015), on the other hand stressed the importance of institutions in economic development for developing countries.

Aslam et al. (2021) also focused on the importance of institutions, along with social inclusion and digital inclusion, by examining a panel of 83 countries. The study results highlighted that institutional quality and inclusive growth have a direct link in the case of higher-income groups of countries, whereas social and digital inclusivity is significant in all three income groups, except for social inclusion in middle-income countries. Adedeji et al. (2013) asserted that growth without access to health and education will not be inclusive in the long run.

Their study revealed that high growth episodes in African countries were also marked by an increase in average opportunities in education and health, thus, necessitating policies directed towards the provision of health and education services to reduce inequality with enhanced growth. Klump and Cabrera (2007) also examined the role of education in achieving pro-poor growth, was also examined by Klump & Cabrera (2007) whose study explained that education increased the incomes of the poor by increasing their knowledge, cognitive skills, nutrition, health, and participation in decision-making and political processes. All these factors increase the productivity and employment opportunities for the poor.

Ali & Son (2007), in their seminal work, examined the access of health and education across different income groups and analyzed how this distribution changed over time using social opportunity function. This study revealed that growth will be inclusive if it increases the function based on the average opportunities available to the population and the equitable distribution of these opportunities. The study concluded that access to primary and secondary education increased, but remained inequitable, as depicted by the upward sloping opportunity curve and EIO.

Another significant determinant of inclusive growth, gender equality, was examined by Zveglich, Jr. & Rodgers (2012). The study showed that gender inequality makes growth less inclusive, as people do not have equal access to opportunities and benefits of the growth process and remain without the fruits of the growth process. The study showed that in China, more educated and married women without children were more likely to be employed, thus showing that economic need is the main driving factor for women to be employed in Asian countries.

Swamy (2010) studied the effect of financial inclusion on inclusive growth in the Indian context was studied by Swamy (2010). The empirical results showed that financial inclusion, savings, credit-to-GDP ratio, and per capita income were significant determinants of inclusive growth.

About Pakistan, very few studies have devoted attention to the subject of inclusive growth. Policymakers have touted growth as a panacea for economic problems; however, evidence suggests that this growth has failed to benefit all segments of the population. Some studies in this regard by researchers such as Asghar & Javed (2011) have concluded that growth has not been inclusive in Pakistan as it was achieved at the expense of equity. Inclusiveness of growth integrates both the efficiency and equity dimensions; therefore, both need to be considered in unison if growth is to be inclusive.

Asghar and Javed (2011) are among the pioneers who discussed growth in the context of inclusiveness. Based on empirical evidence, the authors concluded that although opportunities for education and employment increased over time, they were largely inequitable. Only a few garnered the fruits of growth in the country, and the majority were excluded from the benefits. On the other hand, Tirmazee and Haroon (2015) followed the same approach in examining growth inclusiveness for Pakistan and showed that growth was not inclusive in Pakistan. This study used the social mobility index and income equity index with principal component analysis to validate the results.

Mohazzam and Atif (2012) revealed that economic growth leads to better education, improved health services, and increased employment opportunities in the U.S., showing that the overall impact of economic growth was inclusive, as it generated active human capital and skilled labor. The authors cautioned that if the aim is to make growth inclusive and pro-poor, then the focus of public expenditure should be on Pakistan's health and education sectors.

From the literature review, it can be inferred that although researchers have used a variety of ways to conceptualize inclusive growth, its definition and measurement remain contentious (Chou, & Huque 2016). Some studies have been conducted on inclusive growth, but only a few studies have been carried out in Pakistan on the measurement and determinants of inclusive growth. This study attempts to fill this gap in the literature (Asif et al., 2019; Munir and Ullah, 2018; Ali, 2007; Ali and Son, 2007; Anwar, Khan and Khan, 2019; Zulfiqar et al, 2016; Asghar and Javed, 2011; Timazee and Haroon, 2015; Siegmann and Majid, 2014).

## 3 Theoretical Framework

This section discusses the conceptual framework of socioeconomic indicators, which are used to construct an inclusive growth index for Pakistan. Much has been written about inclusive growth, but there is still no universally accepted definition of inclusive growth, which makes its measurement challenging.

According to the Asian Development Bank's strategy for 2020, two key dimensions of inclusive growth are: (1) achieving sustainable growth and (2) ensuring equal access to opportunities. Some of the crucial variables for achieving inclusive growth are recognized as economic growth, productive employment, economic infrastructure, equity, access to education, health and basic infrastructure utilities, social protection, governance, and strong institutions (Mckinley, 2010; Asian Development Bank, 2011; Alexander, 2015).

Based on these variables, this study constructs an Inclusive Growth Index. Figure 1 shows the theoretical framework of the different dimensions of inclusive growth used in this study.

Figure 1 illustrates the key drivers of inclusive growth. We develop our theoretical framework based on Vellala et al. (2014), who consider economic growth as one of the prerequisites for inclusive growth. In addition to their theoretical model, our model depicts economic growth due to infrastructure development. Economic growth improves employment productivity.

Better and more productive employment opportunities help reduce income inequality, which has a positive impact on human capabilities, as measured by health and education. On the other hand, improved governance would lead to better gender parity, leading to a trickle-down effect of growth in the country, which would further enhance human capabilities. All these effects lead to inclusive growth. Figure 1 explains the key drivers.

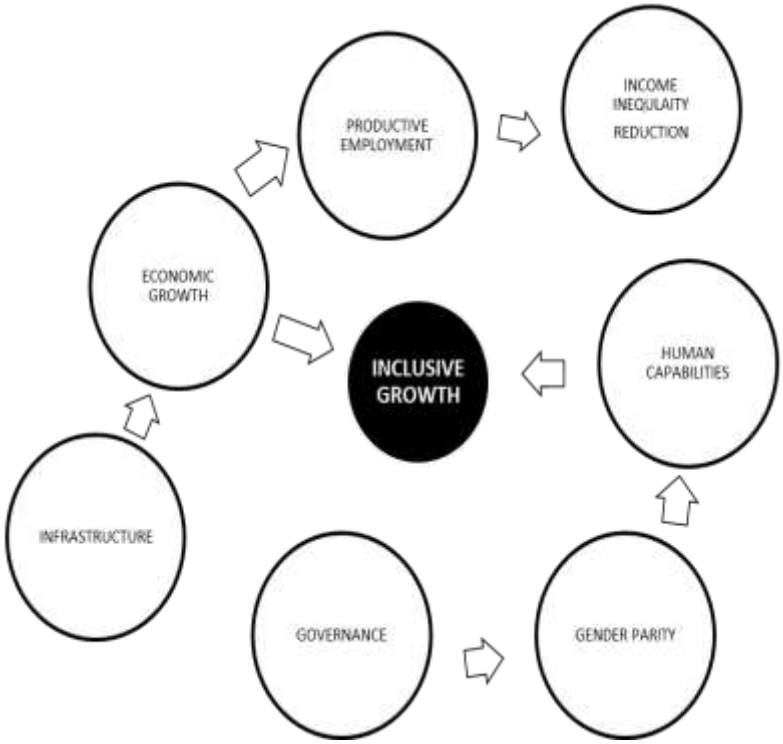


**Figure 1**

**Key Drivers of Inclusive Growth**

The first indicator of inclusive growth is economic growth, measured by GDP per capita growth, agriculture value-added, and industry value-added. Growth in GDP per capita is necessary for the expansion of economic opportunities, and as a result, holds prime importance when discussing the progression of inclusive growth.

In addition, changes in value added in the industry and agriculture sectors to identify trends in the structure of growth changes are also of prime importance. Productive employment is a key indicator of inclusive growth. Economic growth leads to productive employment, which, in this model, encompasses employment in three sectors of the economy: agriculture, industry, and services.

Indicators for infrastructure include mobile subscriptions, electric power consumption (KWH per capita), road density, telephone, and railway lines. The provision of adequate infrastructure networks is essential for sustainable economic development and inclusive growth. There are four major means of transport in Pakistan: railways, Pakistan's international airways, roads, ports, and shipping (Saeed, 2010).

Road infrastructure is a catalyst for employment, growth, and economic activities. Therefore, it is an important element of the government's poverty reduction strategy. Similarly, an effective railway system facilitates trade, reduces transportation costs, and promotes rural development and national integration among commuters. About mobile subscription, the number of subscribers has increased in recent years owing to advancements in the telecommunications industry.

It is also essential to examine the non-income dimensions of inclusive growth, such as human development outcomes, including good health and education. Access to education and health services is a vital measure of social protection because of the lack of education, poor health sabotage capabilities, and equal opportunities for better jobs.

The education indicators include*d* primary and secondary school enrollment rates and pupil–teacher ratios. The pupil–teacher ratio is a good measure of the overall quality of an education system as it measures teachers' workload, resource allocation in public schools, and the amount of attention a student is likely to receive from the teacher. Health indicators include variables such as life expectancy at birth, mortality rate under five years, and immunization. These variables measure the overall quality of life of a country and serve as an indication of potential returns for investing in human capital.

Gender parity and income equality are also relevant dimensions that make the process of growth inclusive. To measure these areas, indicators such as gender parity are considered in two main areas of social and economic life, namely primary and secondary education and labor force participation, while the Gini Coefficient is used as a measure of income equality. Sex parity was further estimated as the ratio of female-to-male estimates for the indicator.

Governance is another significant indicator of inclusive growth. This study used the Asian Development Bank's initial recommendation for measuring governance, which uses the ratios of revenue and public investment to GDP. Both indicators play an important role in promoting the government's inclusive growth agenda.

The ratio of revenue to GDP is a barometer of government success in mobilizing domestic sources of finance (McKinley, 2010). Similarly, the ratio of public investment to GDP is an indicator of the government's willingness to invest in development. In the case of low-income and lower-middle-income countries, the government needs to increase public investment to provide essential economic and social services.

## 4 Data and Research Methodology

### *4.1.1. Data Source*

The present study employs time series data (1980 to 2022) for the empirical estimation of the model using multiple sources, including various issues of economic surveys of Pakistan, World Development Indicators Database of the World Bank, State Bank of Pakistan, Asian Development Bank, Penn World Tables, and the Handbook of Statistics on Pakistan's economy.

### *4.1.2. Applied Framework*

This section discusses the steps considered for the empirical methodology. The first step in the empirical analysis was the construction of an inclusive growth index via PCA. The constructed index is used in a linear regression model as a dependent variable to explain the standard growth model.

### *4.2.1. Index Construction*

To construct the index, a set of twenty-four socio-economic variables were used. The selected variables were normalized before conducting the empirical analysis. Normalization is the process of adjusting the values measured on different scales to a notionally common scale (usually prior to averaging). The normalization method employed in this study was standardized using z-scores.

Standardization converts the variables to a common scale with a mean of zero and a standard deviation of one. The z-score was computed as follows:

$$Z_{ij} = \frac{Xij - Mj}{S_j} \quad (1)$$

where $X_{ij}$= value of the $i_{th}$ indicator in the $j_{th}$ region; $M_j$= mean value of the $i_{th}$ indicator; and $S_j$= standard deviation of the $i_{th}$ indicator.

After normalizing the data, PCA was used to construct an inclusive growth index using SPSS software. The following steps were taken in the construction of the index:

*I. Sample Adequacy*

Kaiser–Meyer–Olkin (KMO) is a measure of sampling adequacy. It compares the magnitude of the correlation coefficient to the partial correlation coefficient to determine whether the data are likely to coalesce into components. For each item, KMO statistics were computed, and their sum was the overall KMO statistic. The KMO value varies between 0 and 1, with higher values indicating better results.

The Kaiser-Meyer measure of sampling adequacy given by

$$KMO_j = \frac{\sum_{i \neq j} r_{ij}^{\,2}}{\sum_{i \neq j} r_{ij}^{\,2} + \sum_{i \neq j} \mu_{i\,j}^{\,2}} \quad (2)$$

The correlation matrix is R= [ $r_{ij}$ ], and the partial correlation matrix is U= [$\mu_{ij}$]

*I. Correlation Matrix*

To apply PCA, the variables must be correlated. Bartlett's test compares a correlation matrix with an identity matrix. It is used to test the null hypothesis that the individual indicators in a correlation matrix are uncorrelated.

A degree of correlation is expected to exist among the variables if the null hypothesis is rejected. The statistics are based on a chi-square transformation of the determinant of the correlation matrix.

Owing to the sensitivity of this test to the sample size, Knapp and Swoyer (1967) and Tabachnick and Fidell (2001) suggested implementing this test along with the KMO measure.

Bartlett test uses the following formula of chi-square distribution

$$\chi^2 = -\left(n - 1 - \frac{2p+5}{6}\right) \times \ln|R| \quad (3)$$

Where |R| denotes the determinant of the correlation matrix. If the variables are highly correlated, the determinant |R|≈0. where "P" is the number of variables, "n" is the number of observations, and is the natural log of the correlation matrix R.

Under the null hypothesis of no correlation, the Bartlett test follows a chi-square distribution with degrees of freedom: $\left[p\ x\ \left(\frac{p-1}{2}\right)\right]$ (4)

**Table 1**

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| **Kaiser-Meyer-Olkin Measure of Sampling Adequacy** | | 0.788 |
| **Bartlett's Test of Sphericity** | Chi Square | 1610.006 |
| | Df | 276 |
| | Sig. | 0.000 |

The KMO and Bartlett's test results are presented in Table 1. The results indicate that the overall value of KMO is 0.788, and the Bartlett test's p-value is significant, which means that some degree of correlation among variables exists. Therefore, our sample met the assumptions of correlation and sample adequacy, suggesting that principal component analysis is an appropriate technique to make the inclusive growth index.

*II. Extracting Principal Components*

The next step in the model was the extraction of principal components. There were as many components as variables included in the analysis. The correlation matrix variance was repackaged into p-values. Each eigenvalue represents the amount of variance captured by the component. Among the four components, Factor 1 explains a larger amount of variance, as is evident from the total column. After extracting the principal components, we used a scree plot to determine the number of components to be retained, and an eigenvalue greater than 1 was the criterion.

**Table 2**

**Total Variance Explained**

| **Component** | **Initial Eigenvalues** | | |
|---|---|---|---|
| | **Total** | **% of variance** | **Cumulative %** |
| **1** | 15.127 | 63.027 | 63.027 |
| **2** | 2.693 | 11.223 | 74.250 |
| **3** | 1.854 | 7.727 | 81.977 |
| **4** | 1.348 | 5.617 | 87.594 |
| **5** | 0.707 | 2.947 | 90.541 |

Table 2 shows the total variance explained. Only those components for which eigenvalues were greater than 1 are reported above, as they were the most important components. Only four components had eigenvalues greater than one. Together, these four components explained 87.594% of the variability in the data, whereas 63% of the variability was explained by component one only.

*III. Correlation among Components*

A simple correlation was run on the saved component scores to determine the correlations among the variables. It was inferred through the correlation matrix that no relationship existed between the components, thus indicating that the orthogonal rotation strategy could be used.

*IV. Rotation*

Among the five orthogonal rotation methods, we used the varimax rotation technique because the components in our case were uncorrelated.

*V. Factor Scores and Factor Loadings*

The entries in the component matrix were rotated, as the rotated component matrix showed a factor loading for each variable. Higher component loadings suggested the importance of the variable to the component. The combination of positive and negative loadings was interpreted as mixed. In our study, infant mortality rate, life expectancy, primary enrollment, telephone lines, secondary enrollment, electricity consumption, road density, GPI primary, GPI secondary, immunization, railway lines, employment in agriculture and services, revenue to GDP ratio, agriculture value added, health expenditure, mobile subscribers, and gender parity heavily loaded on the first component, while the remaining variables loaded on components two, three and four.

*VI. Non-Standardized Index*

This is the final step in the construction of the composite index. By applying the following formula to the number of components extracted and by generating factor scores, the inclusive growth index was computed as follows:

**NSI=** (individual variance of component 1/total variance) *factor score 1 + (Individual variance of component 2/Total variance)*Factor score 2 + (Individual variance of component 3/Total variance)*Factor score 3 + (Individual variance of component 4/ Total variance)* factor score 4 (5)

**NSI =** (63.027/87.594)*Factor score 1 + (11.223/87.594)*Factor score 2 + (7.727/87.594)*Factor score 3+ (5.617/87.594)*Factor score 4 (6)

Finally, the index is standardized using the following formula:

**Standardized Index** = (NSI – Minimum of Standardized index) / (Maximum of NSI – Minimum of NSI)

*4.1.3. Multiple Linear Regression Model*

After constructing the inclusive growth index, it was used as the dependent variable in the multiple regression model. The explanatory variables used in the model were (i) foreign direct, (ii) financial deepening, (iii) inflation rate (measured from the CPI), and (iv) domestic investment. While foreign direct investment contributes to growth and development by complementing domestic investment and facilitating trade and technology transfer, it could also create inequalities, societal exclusion, and unrest if it is not accompanied by social progress (Deloitte, 2015). Domestic investment is measured by the gross fixed capital formation. It was the acquisition of fixed assets by the government and households of the economy. Financial depth ensures an economy's resilience and capacity to cope with shocks, improves the effectiveness of macroeconomic policies, and supports inclusive growth. Financial depth was measured by domestic credit to the private sector as a percentage of GDP.

*4.2.3. Sample Adequacy for a set of variables:*

**Table 3**

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| **Kaiser-Meyer-Olkin Measure of Sampling Adequacy** | | 0.788 |
| **Bartlett's test of Sphericity** | Approx. Chi Square | 1610.006 |

The overall measure of sampling adequacy exceeds the minimum requirement of 0.50, indicating sufficient items for each factor.

| | |
|---|---|
| Df | 276 |
| Sig. | 0.000 |

Table 3 shows KMO and Bartl atisfied the screening criteria for the appropriateness of the factor an lysis. The next step was to determine the number of factors that shou t analysis solution.

The significant value (less than 0.05) shows that the correlation matrix is significantly different from an identity matrix where the correlation is zero between all variables.

**Table 4**

**Extraction Method: Principal Component Analysis**

**Communalities**

| | **Initial** | **Extraction** |
|---|---|---|
| **Health Expenditure** | 1.000 | .873 |
| **Mobile Subscribers** | 1.000 | .907 |
| **Electricity Consumption** | 1.000 | .978 |
| **Road Density** | 1.000 | .989 |
| **GDP Per Capita** | 1.000 | .678 |
| **Employment in Agriculture** | 1.000 | .890 |
| **Employment in industry** | 1.000 | .834 |
| **Employment in Services** | 1.000 | .932 |
| **Agriculture Value Added** | 1.000 | .904 |
| **Industry Value Added** | 1.000 | .762 |
| **Primary Enrollment** | 1.000 | .981 |
| **Secondary Enrollment** | 1.000 | .974 |
| **pupil/teacher Ratio** | 1.000 | .753 |
| **GPI Primary** | 1.000 | .879 |
| **GPI Secondary** | 1.000 | .921 |
| **Railways Line** | 1.000 | .925 |
| **Mortality Rate Infant** | 1.000 | .993 |
| **Life Expectancy** | 1.000 | .988 |
| **Gini Coefficient** | 1.000 | .699 |
| **Education Expenditure** | 1.000 | .901 |
| **Gender parity in labor** | 1.000 | .530 |
| **Immunization** | 1.000 | .888 |
| **Telephone Lines** | 1.000 | .972 |
| **Revenue/GDP** | 1.000 | .874 |

Table 4 lists the importance of each of the twenty-three components. Only the first four components have eigenvalues greater than one; therefore, they are important components to be retained for

further analysis. When the eigenvalue is less than one, the component explains less information than a single item.

Table 5 shows how the variance was divided among the 24 possible components. The latent root criterion for the number of factors to be extracted indicates that only four components with eigenvalues greater than one are extracted. The percentage of co-variation among items was accounted for by each component before and after rotation. The first four components account for 87% of the variance. The table shows that the overall percentage is the same under both conditions, but there is a very different division between them.

**Table 5**

**Extraction Method: Principal Component Analysis**

**Total Variance Explained**

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 15.127 | 63.027 | 63.027 | 15.127 | 63.027 | 63.027 | 13.670 | 56.958 | 56.958 |
| 2 | 2.693 | 11.223 | 74.250 | 2.693 | 11.223 | 74.250 | 3.364 | 14.018 | 70.976 |
| 3 | 1.854 | 7.727 | 81.977 | 1.854 | 7.727 | 81.977 | 2.153 | 8.971 | 79.947 |
| 4 | 1.348 | 5.617 | 87.594 | 1.348 | 5.617 | 87.594 | 1.835 | 7.647 | 87.594 |
| 5 | .707 | 2.947 | 90.541 | | | | | | |

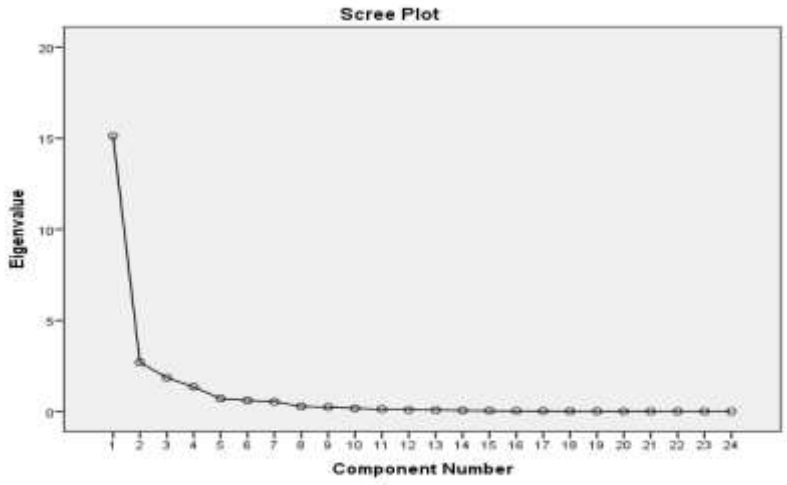


**Figure 2**

**Scree Plot Graph**

Figure 2 shows the scree plot graph, indicating that only the first four components had eigenvalues greater than 1. After the fifth component, the line was almost flat, indicating that each successive component explained only a small amount of the total variance.

**Table 6**

**Extraction Method: Principal Component Analysis**

| **Component Matrix** | | | | |
|---|---|---|---|---|
| | **Component** | | | |
| | **1** | **2** | **3** | **4** |
| **Mortality Rate Infant** | -.994 | | | |
| **Life Expectancy** | .989 | | | |
| **Primary Enrollment** | .988 | | | |
| **Telephone lines** | .985 | | | |
| **Secondary Enrolment** | .971 | | | |
| **Electricity Consumption** | .967 | | | |
| **Road Density** | .946 | | | |
| **GPI Primary** | .933 | | | |
| **GPI Secondary** | .931 | | | |
| **Immunization** | .921 | | | |
| **Railway lines** | -.888 | | | |
| **Employment In Agriculture** | -.887 | | | |
| **Employment In services** | .844 | | | |
| **Revenue/GDP** | -.831 | | | |
| **Agriculture Value Added** | -.817 | | | |
| **Health Expenditure** | -.795 | | | |
| **Mobile Subscribers** | .707 | | | |
| **Gender Parity In Labor** | .678 | | | |
| **Employment In industry** | | -.753 | | |
| **pupil/teacher Ratio** | | -.711 | | |
| **GDP Per Capita** | | | -.650 | |
| **Industry Value Added** | | .521 | -.644 | |
| **Gini Coefficient** | | | .550 | |
| **Education Expenditure** | | | | .699 |

Table 6 presents the component landings, which are the correlations between the component and variables.

**Table 7**

**Extraction Methods: principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization (Rotation converged in 6 iterations)**

| **Rotated Component Matrix[a]** | | | | |
|---|---|---|---|---|
| | **Component** | | | |
| | **1** | **2** | **3** | **4** |
| **Road Density** | .986 | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Electricity Consumption** | .974 | | | | |
| **Mortality rate Infant** | -.952 | | | | |
| **Employment In services** | .952 | | | | |
| **Life Expectancy** | .951 | | | | |
| **Primary Enrollment** | .948 | | | | |
| **Immunization** | .929 | | | | |
| **Employment In Agriculture** | -.925 | | | | |
| **Telephone lines** | .924 | | | | |
| **GPI Secondary** | .897 | | | | |
| **GPI Primary** | .896 | | | | |
| **Agriculture Value Added** | -.895 | | | | |
| **Secondary Enrollment** | .884 | | | | |
| **Railway lines** | -.776 | | | | |
| **Revenue/GDP** | -.687 | | | | .514 |
| **Health Expenditure** | -.658 | | | | .568 |
| **Gender Parity In Labor** | .580 | | | | |
| **Indstry Value Added** | | -.865 | | | |
| **Mobile Subscribers** | | .805 | | | |
| **pupil/teacher Ratio** | | .677 | .523 | | |
| **Employment In industry** | | | .807 | | |
| **Gini Coefficient** | | | -.705 | | |
| **GDP Per Capita** | | | .636 | | |
| **Education Expenditure** | | | | | .916 |

Table 7 presents the rotated factor loadings. The rotated component matrix shows the item or variable loads on the variable after rotation. This rotated matrix sorted the 24 inclusive growth indicators into four overlapping groups of items. Items are sorted in such a way that those that have the highest loadings (correlation is taken in absolute value) from Principal Component 1 (17 items in this component) are listed first and sorted in descending order of factor weights. The next three items that have their highest loadings from principal component two are listed in the same way from the highest loading to the lowest. Principal component three contains three items that are loaded highly on it. Finally, the last item loaded heavily on principal component four.

*4.1.4. Regression Model*

The 'k' variable linear regression model can be written as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_k X_k + \mu \qquad (7)$$

where y is inclusive growth, X1 is foreign direct investment, X2 is Investment (gross fixed capital formation), X3 is financial deepening (domestic credit to the private sector), and X4 is inflation.

## 5 Empirical Results

The results of the study summarized in Table 8 show that standard economic growth determinants, inflation, and domestic and foreign direct investment were statistically significant determinants of inclusive growth. These findings are consistent with those reported by Ali et al. (2012), Azam and Khattak (2009), and Anand et al. (2013). Financial deepening, measured by domestic credit to the private sector, has a negative impact on inclusive growth, although the impact is not statistically significant. A negative and significant coefficient of inflation implies that monetary policy aimed at macroeconomic stabilization supports inclusive growth (Ayoagi & Ganelli, 2015). In terms of globalization, foreign direct investment fostered inclusive growth. The overall regression model was statistically significant at the 1% level.

**Table 8**

**Multi-linear regression model results for determinants of Inclusive Growth**

## 5 Conclusion

| Variables | Co-efficient | Std Error | t-Stat | Prob |
|---|---|---|---|---|
| **FDI** | 0.121** | 0.062 | 1.952 | 0.0560 |
| **Investment** | 0.024*** | 0.005 | 4.8 | 0.0002 |
| **Inflation** | -0.018*** | 0.008 | -2.25 | 0.0399 |
| **Financial deepening** | -0.01 | 0.014 | -0.714 | 0.4372 |

The study concludes that inclusive growth is both the outcome and the process, as it ensures that poor people not only participate in the growth process but also reap the benefits of growth equally. The theoretical model provides a framework for policymakers to come up with the right policy mix to lead Pakistan towards inclusive growth. The theoretical framework provided in this study attempts to reduce inequality, invest in human development for better human capabilities, and improve gender equity. This shows that policymakers should focus on policies for enhancing human capacity rather than pro-poor growth policies that focus only on transfers to the poor through subsidies and other ways. The empirical analysis highlighted some of the major determinants of inclusive growth in Pakistan. The results show that inflation and domestic and foreign investments are significant determinants of inclusive growth. Similar to IMF (2007), the study results indicate that foreign direct investment has a significant positive impact on inclusive growth. However, domestic credit to the private sector, indicated by financial deepening, negatively impacts inclusive growth, although the impact is not statistically significant. This is because inclusive growth emphasizes both the distribution and pace of growth. Hence, a monetary policy aimed at macroeconomic stabilization, domestic investment, and globalization in terms of foreign direct investment is effective in promoting inclusive growth.

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**Appendix**

| Dimension | Area of Index | Indicators | Source |
|---|---|---|---|
| *Economic Growth* | GDP per Capita | GDP per capita growth (annual %) | WDI |
| | Agriculture value added | Agriculture value added (% of GDP) | WDI |
| | Industry values added | Industry values added (% of GDP) | WDI |
| *Productive Employment* | Employment in agriculture | Employment in agriculture (% of total employment) | Economic Surveys of Pakistan |
| | Employment in industry | Employment in industry (% of total employment) | Economic Surveys of Pakistan |
| | Employment in services | Employment in Services (% of total employment) | Economic Surveys of Pakistan |
| *Infrastructure* | Mobile subscription | Mobile Cellular Subscriptions (per 100 people) | International Telecommunication union (ITU), WDI |
| | Road Density | Road Density (Km/100 sq km of land area) | For total length of roads is from Economic survey of Pakistan 2013-14 statistical appendix , table 13.1 |
| | Electric power consumption | Electric power consumption Kwh per capita | WDI |
| | Rail Lines | Rail Lines (Total route km) | Economic survey of Pakistan |
| | Telephone Lines | Fixed telephone subscriptions (per 100 people) | International Telecommunication Union, World Telecommunication/ICT Development Report and database. |
| | | Pupil teacher ratio (primary) Head count basis | WDI |

| | | | |
|---|---|---|---|
| ***Health Capabilities*** | Education | Primary school Enrollment (000) numbers | 50 years of Pakistan in statistics. Economic Survey of Pakistan 2008-09 Statistical Appendix, Table 10.2 and Survey 2013-14, Table 10.2. |
| | | Secondary school Enrollment (000) numbers | 50 years of Pakistan in statistics. Economic Survey of Pakistan 2008-09 Statistical Appendix , Table 10.2 and Survey 2013-14 , Table 10.2 |
| | | Government Expenditure on education (% of GDP) | Global economy.com and WDI. |
| | Health | Mortality rate, under five (per 1,000) | WDI |
| | | Life Expectancy at Birth , total (years) | WDI |
| | | Government expenditure on health (% of GDP | Health and nutrition chapter 11 Economic survey of Pakistan 2013-14 Table 11.3 and Hand Book of statistics on Pakistan economy Table 11.9 Expenditure on health pg. 684-86, state bank of Pakistan. |
| ***Gender Parity*** | Gender Participation | Gender Parity in Primary education | Pakistan economic survey various issues |
| | | Gender Parity in secondary education | Pakistan economic survey various issues |
| | | Gender parity in labor force participation. Ratio of female to male labor force participation rate (%) (national estimate) | Pakistan Economic survey various issues |
| ***Inequality*** | Gini Co efficient | Gini Co-efficient | Economic survey of Pakistan 1999-2000 Chapter 4, Table 4.2 page no.49. Chapter 19 'poverty trends, causes and solutions' Table 19.4 Of Akbar Zaidi Book, survey 2002-03 page no.50 and WDI. |
| ***Governance*** | Revenue To GDP ratio | Revenue To GDP ratio | Pakistan Economic Survey various issues |