Inclusive Growth and the Efficacy of Macroeconomic Policies in Developing Countries

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DEDICATION

This thesis is dedicated to my loving Dad ***Jaffar Ali*** and Mom ***Fatimah***

For endless love, support, encouragement, prayers and sacrifices

DECLARATION

I, **Zakia Batool** D/O **Jaffar Ali,** Registration No. 160-FE/PhD/S16, student of Ph.D Economics in Faculty of Economics, International Institute of Islamic Economics, International Islamic University, Islamabad, do hereby solemnly declare that the thesis entitled: "**Inclusive Growth and the Efficacy of Macroeconomic Policies in Developing Countries**", submitted by me in partial fulfillment for the award of Ph.D degree in Economics, is my original work, except where otherwise acknowledged in the text, and has not been submitted or published earlier and shall not, in future, be submitted by me for obtaining any degree from this or any other university or institution.

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ABSTRACT

The increasing concern of the economies towards achieving a growth pattern that addresses economic, social, and environmental issues all together draws the attention of policymakers towards achieving inclusive growth. The objective of this study is to analyze the interactive role of fiscal and monetary policy along with financial inclusion on dimensions of inclusive growth as well as on aggregate inclusive growth using a panel data of 51countries for the period 1995-2017. For this purpose, we constructed an index for inclusive growth, its dimensions, and financial inclusion. State-of-the-art panel data estimation methods such as pooled estimation, fixed-effect, and random-effect models are used in this study whereas for robustness checks and to handle the problem of endogeneity FE-IV technique is also used.

Regarding the interactive impact of macroeconomic policies and financial inclusion on the economic dimension, results show that given high government expenditures, expansionary monetary policy adversely affects the economic dimension of inclusive growth because the resulting inflationary pressure causes budget deficit and affects economic stability negatively while financial inclusion by providing monetary ease to the poor improves economic inclusiveness.

Regressions of macroeconomic policies and financial inclusion on the social dimension show that the high levels of government expenditure combined with high levels of money supply improve social inclusion, because at the time of lack of resources money supply, through seigniorage, helps the government to finance social goods. Thus, the effectiveness of money supply in improving social inclusion reduces conditional to the high level of taxes because inflationary pressure created by excess money supply and the distortionary effect of taxation make the socially neglected groups worse-off, whereas an increase in money supply has a large effect on social inclusion given the low levels of financial inclusion and high government expenditures.

While assessing the impact of policies on the environment dimension, this study concludes that money supply affects the environmental dimension positively given low levels of government expenditures and financial inclusion, because at high levels of financial inclusion and government expenditure the scale effects emerge and reduce the positive effect of the money supply. This study also explores the impact of macroeconomic policies and financial inclusion on the aggregated index of inclusive growth and concludes that the effectiveness of monetary policy depends on the level of financial inclusion and fiscal actions. Therefore, while setting the interest rate, central banks have to keep into consideration the effect of fiscal policy on aggregate demand and thus inflation, whereas financial inclusion extends the reach of monetary policy to the financially excluded section of the economy.

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CHAPTER 1
INTRODUCTION

Macroeconomic policies of any economy, whether developed or developing, are intended to meet the targets of economic growth, economic development, and equal distribution of income and poverty reduction. These macroeconomic policies are used simultaneously to achieve economic growth in harmony with the welfare of society. While running on the path of economic growth, many individuals lag in the race due to a lesser amount of opportunities available to them and thus have been thrown into a passive position. In every society, there exist disadvantaged groups who have failed constantly to take part in the development of the economy and reap the benefits of economic growth as well. The increasing concern of the economies towards achieving a growth pattern that addresses the issues of all classes of the society on economic, social, and environmental aspects all together draws the attention of policymakers towards achieving inclusive growth. Therefore, assessment of the impact of macroeconomic policies and other factors such as financial inclusion on inclusive growth is immensely important. This section of the study attempts to draw the attention of the policymakers on why it is important to make economic growth inclusive and what are the probable factors that can be thought to have a role to strike the problem of the study.

1.1 Background

The early development theories post World War II have been focusing more on economic growth because they are of the view that all the resources of the economy should be vested to boost economic growth and that gradually the fruits of this growth process will reach all individuals in the economy. Lewis (1954) introduced a model of dual-sector,

capitalists and subsistence sector, in which he explained that at the initial stages of development, the subsistence sector provides an unlimited supply of labor at low wages that causes the capitalists to have high capital returns and expand their sector to absorb more labor from subsistence sector, thus, this process of reinvesting the profits and increasing employment continues and leads to the self-sustained economy, whereas Kuznet (1955) highlighted that economic growth results in increasing income inequality in poor countries while the opposite happens in developed nations. Such inequality in income distribution in developing economies brings with it economic and social problems and creates restlessness and affects marginal productivity of factors of production, therefore equity lacking growth processes cannot bring in sustainable economic growth. Until the 1990s, the UN development agenda has been incorporating social objectives but it could not get dominancy whereas issues on economic growth and international economics attained the primary attention of the researchers (Fukuda-Parr, 2013).

The trade-off between economic growth and inequality has remained a fundamental issue when it comes to the discussion on the effectiveness of economic policies to achieve the growth objectives of the economy; therefore, there is a dire need to look for ways to make growth more redistributive. The debates on economic development are now widely focusing on inclusive growth as an essential pillar of the development process because inclusive growth involves both participation and benefit-sharing. It ensures the participation of everyone in the economy by providing equal access to opportunities, thereby enabling every participant to reap their share of the growth. In short, inclusive growth ensures a growth pattern that leads the economy on a path of sustainable growth

and reduces unemployment, income inequality, and poverty. Ranieri and Ramos (2013) are of the view that inclusiveness should be an essential part of growth strategies as it guarantees equal opportunities for the masses and protects markets and transitions in employment. Inclusive growth does not target income distribution directly, focusing on productive employment growth. As a result, such an approach to growth leads to equity-oriented long-term economic growth.

On the other hand, economists have long been indulged in the discussion on the effectiveness of macroeconomic policies to have a stable economy. The Great Depression was the most intriguing and complex economic event in the history of America. It caught the attention of researchers and prompted them to think about the effectiveness of fiscal and monetary policy and the need for sound financial institutions to maintain financial stability. It is therefore that quite a few revolutionary theories came into existence after the Great Depression. It is observed that economic and financial crises hit the poor segment of the economy more heavily because the poor segment does not have enough resources to protect themselves from the adverse effects of the crisis. The tools of fiscal policy, that is, taxes and expenditures tend to tone down the adverse effects of the economic and financial shocks (Lee and Park, 2014). Keynesians suggested that government intervention is much needed in times of low output level and high unemployment. The advocates of Keynesianism faced severe criticism in the 1970s when they failed to put forward a feasible solution to handle the growing deficit and debts of developed economies that resulted from oil price shocks while they got revival again in the late 2000s when the fiscal stimulus packages were introduced by many countries to mitigate the adverse effects of the financial crisis of 2007-08 such as a reduction in global

economic activity followed by the great recession and high unemployment. Musgrave (1959) in his study explained that the role of fiscal policy is beyond stabilization since the tools of fiscal policy, that is, taxes and government expenditures can better help to reallocate the economic resources and thus redistributes income. Thus, policies related to taxes, government transfers to households, and subsidies do not contribute to human capital directly but helps in protecting low-income households. On the other hand, monetarists deny the proficient role of fiscal policy and believe in the active role of monetary policy in stabilizing the economy. Friedman (1959), considering market benevolence, argued that by affecting aggregate demand, monetary policy can affect output and employment in the short run if the economy is operating below the full employment level; however, monetary policy is effective in controlling inflation in the long run.

It is observed that, for a long time, advanced economies have set their aims towards achieving inclusive growth. To achieve the target of inclusive growth, advanced economies have been practicing fiscal policy. These economies designed fiscal policy in such a way that it could generate revenue using progressive taxation and redistribute income from rich households to poor using subsidies and transfers, also, these economies have planned social programs in such a way to promote economic activities and thus contribute to economic growth. Kitao (2010) suggests that a temporary cut in income tax raises the workers' incentive to work and their savings and affects the aggregate output positively while on the other hand, it reduces income inequality because in the developing world mostly the tax-payers belong to low or average income groups. An investment made by the government in education and health makes the poor section have

easy access to education and health facilities and affects their productivity, thus these public investments reduce income inequality while at the same time does not make any harm to the growth process. In contrast, the developing economies have been using fiscal instruments just to raise the revenue figures or to facilitate investor class so that a heave in economic growth could be realized.

Alternatively, monetary policy through interest rate mechanism affects consumption and investment level and adjust employment rate to the level that ensures inclusive growth (Chang and Jaffar, 2014; and Adediran et al., 2017). Monetary policy can also help in fostering inclusive growth since the policy has the potential to upgrade the level of investment and prevent the economy from inflationary pressures. Along with other factors, for instance, the institutional factors like the impartiality of monetary authority, monetary policy can also play the role of catalyst in the process of revival of the financial sector. The skyrocketing inflation rates in developing countries are one of the main factors that worsen the distribution of income (Albanesi, 2007). Thus, monetary policy has the prospective to have a positive effect on inclusive growth by maintaining a low level of inflation and reducing the swiftness at which distribution of income gets deteriorated during the economic growth process. A low inflation rate helps in protecting the purchasing power of individuals and thereby supports the poor to maintain their living standards as they do not have any other source to adjust their decreasing real income due to price increase.

A survey conducted by Lopez (2004) confirms that a low level of inflation rate along with macroeconomic stability takes the economy to the road that leads towards sustained economic growth and improved income distribution. A transparent, well-planned, and

well-executed monetary policy can help the economy to meet the targets of macroeconomic stability and maintain a low inflation rate. The interest rate management ability of monetary policy contributes to a smooth interest rate over the economic cycles and thus brings about consistency and sustainability in economic growth. Monetary policy can affect the well-being of economic agents by affecting credit availability. The investment level is much affected by the cost of credit; therefore, a reduction in the cost of credit can cause an increase in output and employment level. In a nutshell, monetary policy, by stabilizing the price level, removes the element of uncertainty and provides an economy a prospect for cumulative long-term growth and employment opportunities.

Along with the active fiscal and monetary policy, a sound financial structure is also needed because a well-developed and easy to access financial system has the potential to make the growth inclusive. For the inclusiveness of growth, the financial system is also required to be inclusive, that is, all the economic agents, whether fall in the category of rich or poor, must have equal and easy access to the financial instruments. A well-developed financial structure enables the economy to have low costs of transaction and information, affects the saving and investment decisions of the economic agents and brings in technological advancements in the economy leading to long-term economic growth (Beck et al., 2010). The poor section of the economy, by having easy access to finance, may have the opportunity to themselves get involved in the investment in production activities, thus resulting in the creation of employment and a way to get out of the circle of poverty. Thus to achieve growth and other macroeconomic targets such as employment and poverty reduction, coordination of fiscal and monetary policy along with a well-organized financial system is essential for any economy.

The problem of inequality and poverty is getting worse in the developing world. Growth in these economies is highly unsustainable with high unemployment and inflation. More than half of the population in the developing nations does not have access to basic facilities like access to safe drinking water and sanitation and others do not have access to health facilities and basic education. Access to financial resources in these economies is also limited. On the other hand, environmental degradation is also becoming a key issue in these countries. A report by UNDP[1] says that households' income inequality is increasing in most of the developing world. In North Africa, Morocco is labeled as a country of wider wealth gap with a 40.3 percent Gini coefficient[2] , and 60 percent of the population is attached to the informal sector that contributed less than one-third in the GDP. For many decades, Asia was idealized by the world for having rapid growth however, in the recent past, this region has been perceived as a region of increasing disparity between haves and have-nots. A report by Forbes (2018) says that the wealth gap of Asia is among the largest in the world. In the case of Vietnam, per day earning of the richest man is more than the sum the poorest man earns in a decade. Whereas a report by Oxfam[3] highlights that, the wealth of the four richest men in the country is more than the wealth owned by 100 million poorest people. In China, one-third of the wealth is owned by one percent of the richest persons whereas only one percent of the total wealth is owned by 25 percent of the poorest[4]. In Pakistan, there is a big difference in the consumption pattern of the rich and the poor, that is, total consumption by the 18 million

[1] United Nations Development Programme (UNDP). (2013). Humanity divided: Confronting inequality in developing countries.

[2] Report by OECD published on 11 July

[3] Oxfam report on Redefining Inclusive Growth in Asia: How APEC can achieve an economy that leaves no one behind, published in February 2017.

[4] A report by Peking University published in 2015.

richest is 1.5 times the total consumption of the 72 million poorest. Also, the Pakistani youth bulge is becoming a ticking time bomb rather than a demographic dividend.

The process of structural transformation is much needed in the developing region but the ongoing trend of robotic technology is turning most of the workforce jobless. UNCTAD[5] says that the effect of using robots as a form of capital will be significantly adverse for developing nations. On the other hand, the process of industrialization requires energy use that leads to environmental degradation. The energy-intensive production methods may lead to high economic growth but at the cost of environmental sustainability[6]. Aoyagi and Ganelli (2015) suggest that fiscal and monetary policy that targets macroeconomic stability, trade-oriented structural reforms, and increasing productivity and employment can help to make growth inclusive. Thus, to accomplish a growth that benefits maximum individuals in developing regions, an active role of monetary and fiscal policy is required, especially for economies with a low level of financial development.

1.2 Research Objectives

Thus, the above discussions motivate to work on the following objectives

a. To construct a comprehensive measure of inclusive growth. Since there is no consensus among researchers on a definite measure of inclusive growth, this study examines different approaches available in the literature and will come up with a comprehensive measure of inclusive growth that includes all the suggested dimensions and indicators in the literature.

[5] United Nations Conference on Trade and Development
[6]Breaking energy "Environmental pollution is inevitable in developing countries" published on 9/23/2014.

b. To analyze the effect of fiscal policy and monetary policy on the economic dimension of inclusive growth.

c. To assess the effect of fiscal policy and monetary policy on the social dimension of inclusive growth.

d. To analyze fiscal policy and monetary policy on the environmental dimension of inclusive growth.

e. To examine the effect of fiscal policy and monetary policy on the aggregated index of inclusive growth.

f. To investigate whether financial inclusion affects the level of effectiveness of monetary policy in promoting inclusive growth.

1.3 Research Questions

This study aims to address the following research questions.

a. How an appropriate measure of inclusive growth can be constructed?

b. What is the effect of fiscal and monetary policy on the economic dimension of inclusive growth?

c. What is the effect of fiscal and monetary policy on the social dimension of inclusive growth?

d. What is the effect of fiscal and monetary policy on the environmental dimension of inclusive growth?

e. What is the effect of fiscal and monetary policy on the aggregated index of inclusive growth?

f. What is the composite impact of monetary policy and financial inclusion on the aggregated index of inclusive growth?

1.4 Scope and Limitations

The foremost objective of this study is to devise a method to construct an index of inclusive growth. Initial studies on the measurement of inclusive growth have been focusing on only economic and social indicators. Since the seventh item on the Millennium Development Goals (MDGs hereafter) is to achieve a sustainable environment and the *2030 Agenda of Sustainable Development* highlights three dimensions to achieve sustainable development, that is, economic, social, and environmental, the studies on inclusive growth have been neglecting the environment part, therefore this study, in addition to economic and social dimension includes environmental dimension for the construction of inclusive growth index so that the agendas of MDGs and Sustainable Development Goals could be met.

This study is an attempt to empirically assess the effect of fiscal instruments (taxes and government expenditures) and monetary policy on inclusive growth in developing countries. There are many studies in the literature that tries to check the effectiveness of the fiscal and monetary policy on either output or income distribution. However, the literature lacks an empirical attempt to assess the coordination of the entire macroeconomic policy variables towards achieving inclusive growth in developing countries, therefore, this study emphasizes mainly to check how the inclusive growth in the developing region is affected by macroeconomic policy variables and tries to find the solution of developing nations' inequality-oriented growth. A well developed and

inclusive financial sector is considered to affect the economy in various aspects. Literature has been stressing the importance of financial inclusion but does not assess the interactive role of financial inclusion and macroeconomic policies. Therefore, this study serves to bridge the gap that exists in the empirical literature and makes an attempt to find the composite impact of financial inclusion and macroeconomic policies on inclusive growth; however, this study is limited to developing countries only.

1.5 Organization of the Study

This chapter aims at introducing the study, its objectives, and its scope and limitations. The remaining work is organized as follows: Chapter 2 reviews existing literature on the subject matter; Chapter 3 includes the details of the model and measurement issues. Chapter 4 focuses on the construction of indices. Chapter 5 presents graphical analysis and descriptive statistics of dependent and independent variables. Chapter 6 discusses the results of models related to the economic dimension of inclusive growth, Chapter 7 is about the results and discussion of the models related to the social dimension of inclusive growth, and Chapter 8 presents the results of the models related to the environmental dimension of inclusive growth. Chapter 9 discusses the results of the analysis of macroeconomic policies and financial inclusion in promoting inclusive growth. Chapter 10 concludes the results and gives policy implications. References are placed at the end of the thesis.

CHAPTER 2

LITERATURE REVIEW

A vast literature is available that shows the attempt of policymakers in suggesting policies to achieve sustainable economic growth. The center of attention of many policymakers and researchers in their studies has been on how to take the economy to the next level of growth however attention of many policymakers in the economies that attained the growth targets shifted to search policies that address the inequality and poverty issues. Growth has remained the imperative part of poverty reduction policies, while redistributive growth is considered to be more effective than distribution-neutral growth. Thus, the concern of economic policymakers has now shifted towards achieving inclusive growth. Inclusive growth is a vast concept. Adedeji et al. (2013) recognize inclusive growth as an idea that is associated with economic and social opportunities available to households and equality in the distribution of these opportunities. Whereas, Ali and Zhuang (2007) give the idea about inclusive growth that it is not just an approach that is limited to redistributive attributes rather it aims at introducing a sustainable growth process in the economy that generates productive employment opportunities to the maximum households and brings in with it social inclusion in the economy that makes the individuals in the economy realize that they are part of the society, creates a sense of belongingness among them and thus all of them have a common identity.

2.1 Introduction

The literary meaning of inclusive growth is related to the pace and pattern of economic growth. Stuart (2011) and Ranieri and Ramos (2013) attempt to define inclusive growth

and are of the view that the notion of inclusive growth revolves around the concept of growth of the economy, poverty, and inequality. The advocates of the inclusive growth approach believe that growth should promote equal distribution and increase human well-being and for this, all needed is an effective policy to reinforce this relationship of growth, distribution, and human well-being. Unequal distribution in income is a root cause of economic instability and creates economic and social unrest. Thus, such economic and social chaos has a strong implication for social solidity and political stability considered necessary for sustainable growth (Berg and Ostry, 2011). Inequality of income is an economic disease that worsens the health of the economy and for that, reason needs to be cured in its early stages. Therefore, equal distribution of income should be at the core of all strategies concerning development and sustainable economic growth. Work is done by Ravallion and Chen (1997) to examine that poverty depends on the distribution of income. And to ensure equal distribution of income, the proponents of the inclusive growth approach put forward the idea that equal access to economic opportunities is a necessary thing to make the participation of every individual in the economy possible. The slogan of inclusiveness of growth is "let's grow together" that is, the benefits of economic growth should be shared equally.

As highlighted by Sen (1992), poverty and inequality are two different concepts that cannot replace each other. Poverty and inequality are in a way or another influence each other. While focusing on the work of Sachs et al. (2004), that examines that in poor countries actual behavior of the economy doesn't fall into line with the Solow model and that the poor economies have an intense tendency to be caught in different forms of poverty traps, Huang and Quibria (2013) draw attention to three types of traps, that is,

low-productivity trap, Malthusian trap and saving trap and suggests that foreign aid can play an effective role to save an economy from falling into these traps and encourage inclusive growth by enhancing human capacity to produce more. Naschold (2002) and White and Anderson (2001) are of the view that poverty and income inequality are linked with economic growth and owing to this association, a little change in the pattern of income distribution is capable of making a noticeable change in poverty level. Smith (1776) in his study explains that inequality causes poverty and these two concepts are interlinked through private property and here the role of government, by protecting the property of the rich class, comes to reinforce inequality in the society.

It is very important to distinguish the terms of inclusive growth and pro-poor growth. Saad-Filho (2010) presented a detailed work on how the idea of inclusive growth emerged and what are the circumstances that forced the economists to deviate their thoughts from the traditional view of growth to a broad-based idea of inclusive growth. Klasen (2010) is of the view that strategies of pro-poor growth involve policies that focus only on people living below the poverty line whereas inclusive growth benefits the maximum of households irrespective of which class they belong to. The idea of inclusive growth is more focused on making sure that there is no socially or economically excluded group in the economy. According to OECD (2006) report, pro-poor growth enables poor households to participate in the growth process and thereby benefit from growth whereas Anand et al. (2014) are of the view that inclusive growth is about a growth process that focuses on the pace of economic growth and its distribution. Growth is not a process that involves only a certain group of individuals and the pattern of the growth should be in a way that its benefits are shared equally by all the participants. Rauniyar and Kanbur

(2010) in their study define inclusive growth as a growth process that is accompanied by a low level of income inequality thus a pro-poor growth can be achieved without its being inclusive because pro-poor growth comes with falling poverty but may result in rising inequality.

Focusing on inclusive growth, McKinley (2010) is of the view that growth of the economy should be sustainable that could create economic opportunities while at the same time guarantee its access to the maximum. Balakrishnan et al. (2013) in their work attempted to analyze the growth pattern of Asia and stress on the fact that not only the present income distribution pattern but also the income inequality in the recent earlier period has a strong bearing on growth outcomes and weakens the ability of income growth to trim down poverty level. While finding out the structural elements of inclusive growth, they find education, employment in industry, and financial inclusion as key determinants and suggest increasing government spending on education, health, and services to increase social safety nets.

Highlighting the importance of social dimension, Dumitrescu (2016) discuss the possibility of achieving inclusive growth on account of the *Europe 2020* Strategy (European Commission, 2010) that highlights that 75% of the labor force will be employed to meet the EU goal of reducing poverty and social exclusion. To meet the goal of increased employment, Dumitrescu (2016) emphasizes that education, Research and Development, and the energy sector can play a vital role in creating new job opportunities. While assessing *Europe 2020 Strategy* to reduce inequality in the region Bogliacino (2014) examines that unfairness in the labor market is accountable for increasing income inequality in the economy and a much-needed thing to bring equal

opportunity and thus equality in the labor market is to have a strong educational system. Along with education, the other strategies that are helpful to eradicate the level of inequality involve producing human capital by focusing on education and health, providing financial facilities to the maximum, and making advancements in the industrial sector. Bogliacino (2014) also brings to light that the financial crisis is among the major reasons that enhance income inequality and increasing asset prices and deficits fuel up the financial crisis.

While analyzing the causes of gender inequality and income inequality in the developing regions of Asia, Niimi (2009) used Millennium Development Goal (MDG 3) proposed indicators, that include access to education and health across gender, the participation of females in the labor market and their political participation. It has been observed in the paper that although women in Asian developing regions are now having access to educational institutions their rate of participation in political and economic activities is debatable. Thus, overall, the gender gap exists particularly in the South Asian Region and the factors that contribute to the existence and widened gap are the economic, social, and cultural. Based on empirical evidence, Niimi (2009) argues that in countries where households are facing economic hardships gender inequality tends to be far above the ground and therefore he suggests that to increase the degree of inclusiveness, these social, cultural, and institutional hindrances needs to be removed and polices should be designed to generate more economic opportunities and improve women's capabilities.

Several studies have been conducted by the Asian Development Bank (ADB hereafter) to emphasize the notion of inclusive growth and its measurement and suggested numerous policies and strategies that can affect inclusive growth. ADB (2013) describes inclusive

growth as the economic growth of a country that is sustainable and gives rise to wider access to socio-economic opportunities to individuals across regions.

2.2 Measurement of Inclusive Growth Index

The literature discusses various methods to measure inclusive growth since the difference in the views of researchers has been observed in the past studies while defining inclusive growth. Ali and Son (2007a) attempted to measure inclusive growth for the economy of the Philippines and construct a social opportunity function (SOF hereafter). The inclusiveness of economic growth is supposed to be directly proportional to SOF. This function depends on two key factors, that is, the availability of opportunities and the distribution of these opportunities among the population. These opportunities include access to education, health, employment, and basic infrastructure, therefore an index for each of the opportunities has been created. However, the measurement of opportunity indices developed by Ali and Son (2007a) uses a similar approach that was introduced by Bonferroni (1941) to construct an index of income inequality. It is mentioned in their study that the index developed by Ali and Son (2007a) is different from the human development index developed by UNDP because the former focuses on the availability and equity of opportunities that lead to human well-being while the latter is focused on the product of well-being.

While attempting to create an appropriate measurement of inclusive growth, Silber and Son (2010) explain the association between the Bonferroni index and the index of inclusive growth. Bonferroni index is primarily used to measure inequality of income and it is more welfare-oriented since it assigns the highest weight to income transfers from

the rich to the poorest class. Bonferroni approach can be extended to measure higher weight to those who have fewer chances of having access to public services and other opportunities that causes an improvement in human well-being. Bonferroni approach helps analyze equal access to opportunities across individuals belonging to different income categories therefore; it is a better approach to assess inclusive growth.

Unlike the inclusive growth measure developed by Ali and Son (2007b), Anand et al. (2013) construct a unified index of inclusive growth based on the social mobility curve which depends on income growth and income distribution. By linking both the micro and macro aspects of growth and inequality, this index attempts to capture the pace as well as the distributional aspect of income growth. Since inclusive growth is a concept not only confined to income level, McKinley (2010) uses a diagnostic approach for the assessment of inclusive growth and mentioned four indicators of inclusive growth, namely access to employment and infrastructure, equity and poverty, human capability, and social protection. The composite index of inclusive growth has been constructed by assigning weights to the indicators, where, 50, 25, 15, and 10 percent weights are assigned to employment and access to infrastructure, poverty and inequality, human capabilities, and social protection respectively.

Based on the study of Mckinley (2010), Udah and Ebi (2016) enlisted seven dimensions of inclusive growth, namely, economic growth, employment, infrastructure, poverty, gender equity, human capabilities, and social protection and the weights assigned to them are 25, 15, 10, 15, 5, 20 and 10 respectively. Using the rankings of the growth of these indicators and the weights assigned to them, the score for each of the indicators has been calculated and the sum of these scores gives the index for inclusive growth, the value of

which ranges from 0 to 10, where the value greater than 5 indicates a satisfactory degree of inclusiveness.

In an attempt to measure and evaluate inclusive growth in China, Min and Xiaolin (2012) assume that economic growth is inclusive if its sustainability is guaranteed while at the same time growth causes a decline in poverty and inequality and improves access to opportunities and social security and thus constructed an inclusive growth index. Relying on the experts' opinion, weights were assigned to economic growth, job opportunities, income inequality, poverty, health and education, and basic social security. Ramos et al. (2013) are of the view that the three indicators of inclusive growth are poverty, inequality, and employment, and based on these three indicators and using the technique of min-max normalization an index has been constructed which is simply the average of the normalizations. The range of the scale is 0 to 1 where the value closer to zero indicates a high degree of inclusiveness and a value closer to 1 shows a low degree of inclusiveness. While providing a framework for the measurement of inclusive growth, Foster (2015) defines inclusive growth as a growth process which has the potential to simultaneously achieve other targets, for example, reduction in inequality and poverty and thus, discusses three measures of inclusive growth namely absolute, relative and benchmark measure. The study also claims that three types of inclusiveness exist, that is, vertical, horizontal, and dimensional. Vertical inclusive growth apprehends poverty and inequality, horizontal inclusive growth apprehends differential impacts across groups while dimensional inclusive growth takes in for questioning the impact of growth on different dimensions of well-being.

Based on the inequality-adjusted-Human development index developed UNDP Report (2011), Huang and Quibria (2013) calculate inclusive growth as a growth rate of inequality-adjusted-HDI (IHDI hereafter). The authors believe that inclusive growth is a growth process that ensures participation with benefit-sharing because an unjust economic growth will be perceived if all the economic agents participate but not all of them share the benefit whereas if a benefit is shared without participation then it will be a welfare phenomenon. The calculation of IHDI revolves around life expectancy, education, and income indices. These indices are adjusted for inequality and the geometric mean of these three indices gives IHDI.

Mlachila et al. (2017) calculate an index for quality growth (QGI hereafter) and argued that good quality growth inevitably leads towards inclusive growth. A growth is known to be of good quality if it is sustainable, rises welfare level, and creates employment opportunities. The authors argue that their index emphasizes both the growth and welfare aspects and therefore QGI is different from HDI since HDI focuses on income levels whereas QGI focuses more on the nature of the economic growth. It is also different from the index of social progress developed by Stern et al. (2014) because it focuses more on social indicators than the growth facets. QGI assigns equal weights for growth and welfare. The four growth indicators are strength (measured by the change in per capita real GDP), stability (inverse of the coefficient of variation growth level), sectoral composition (measured by subtracting Herfindahl-Hirschman index from one), and demand composition (net external demand as a percentage of GDP) whereas the two social outcome indicators are health (measured by life expectancy and reverse of mortality rate) and education (measured by primary school completion rate).

A report by Boarini et al. (2015) presents a framework to define measure, and analyze the impact of different policies on economic growth. This report defines inclusive growth as growth that causes an increase in multifaceted living standards of representative households, in other words, it is mainly increase in the standards of living. The index of standards of living is an aggregation of income and non-income dimensions, that is, employment and longevity. Thus, inclusive growth leads to an increase in human well-being by causing unemployment to fall and improving the health conditions of households. The weights to these dimensions are assigned using meta-data analysis. The index is believed to reflect people's preferences because it takes into account the objective dimensions of welfare whereas the weights assigned are subjective. Wan & Zhuang (2015) published a survey report on inclusive growth in which three aspects of inclusive growth have been discussed, that are economic, social, and environmental. The environmental dimension includes sanitation facilities, water sources, greenhouse gas emissions, forest areas, and consumption of fossil-fuel. The linear-scoring method was used to score the components and simple arithmetic mean has been employed to aggregate the components.

In an attempt to construct an index of inclusive growth for Pakistan, Asghar and Javed (2011) argue that the development of an inclusive growth index will help in assessing the growth process, that is, whether it promotes inequality or reduce it. Employing several micro-level socio-economic indicators, two approaches have been used in this study. The first approach is the opportunity curve approach which helps in assess and rank the opportunities and in the second approach, two indices have been used. The indices used in the second approach are the index for an opportunity (IO) and its equity index (EIO)

and the main objective of this approach is to gauge variations in opportunities and their level of equity over time. Tirmazee and Haroon (2015) also conduct a study to check whether the economic growth of Pakistan is inclusive or not. They are of the view that growth will be inclusive if it tends to reduce poverty simultaneously, thus the study focuses on measuring inclusive growth index using the methodology suggested by Anand et al. (2013) which utilizes social welfare function. The findings of the study verify the existence of a trade-off between growth and income inequality consequently growth of Pakistan's economy is not inclusive. Working on the measurement of unified inclusive growth index, Khan et al. (2016) make use of the methodology suggested by Mckinely (2010) and while taking into consideration different indicators of the dimensions such as economic growth, accessibility to health, and water and sanitation, income inequality and governance assigns different weights to them. Based on their result, Khan et al. (2016) conclude that in the case of Pakistan inclusiveness of growth is at a satisfactory level.

2.3 Fiscal Policy and Inclusive Growth

Since the fiscal policy is related to both economic stability and redistribution of income, fiscal policy tools can be used to achieve inclusive growth. According to Hicks (1939) and Kaldor (1939), the prime objective of tax and transfer policy is redistribution. In their study, Hicks (1939) and Kaldor (1939) are of the view that the main objective of the economy should be to attain steady-state growth, and then a suitable distribution of income can be achieved through distortion neutral taxes and transfers. Whereas, Roy (2014) is of the view that fiscal policy can do more than income distribution by providing an environment that increases economic growth, protects the economy from exogenous shocks, and increases human capital by providing health and education and thus increases

the participation of people in the growth process. Many studies have explored the importance of fiscal policy tools in correcting income distribution and speeding up the economic growth rate. García-Peñalosa (2010) in his study assess that fiscal policy plays a potential role to affect both income distribution and economic growth whereas Muinelo-Gallo and Roca-Sagales (2011) examine that an increase in investment in education and health results in a reduction in income inequality and this public investment does not harm economic growth. While an increase in direct taxes and current expenditure may reduce income inequality but at the cost of a reduction in output.

Many studies have been conducted to examine the role of fiscal policy in ensuring inclusive growth in Asian economies. Heshmati et al. (2014), while analyzing the effect of fiscal policy on income distribution, poverty, and inclusive growth in Asia, suggest that a policy package of tax cuts and spending cuts can reduce income inequality and enhance economic growth. However, Lee and Mason (2012) focused on the lifecycles and the available support system in Asia. The whole life of an individual can be categorized as childhood to young age, working-age, and old age. The consumption exceeds production at a young age and the old age because they are not capable to work at this age and therefore their contribution to production is lowest while the opposite happens in the working age. By financing the children and the old age individuals through transfer payments, the government may help to reduce the income-consumption gap which, in turn, may help to make inclusiveness certain.

The trade-off issue between equality and efficiency has remained part of the discussion on the effectiveness of the fiscal policy. Browning and Johnson (1984) using the micro-data base evaluated the effect of a tax-transfer scheme to correct income distribution on

labor supply and the findings suggest that marginal cost decreasing inequality is high. Estrada et al. (2014) examine that in Asian economies, the trade-off phenomenon of economic growth and income distribution is observed commonly and the growth-oriented strategies make the distribution of growth-benefits unequal and, thus the situation calls for fiscal policy to come into action and correct the distribution of income. Government spending and taxation are used rigorously to remove the deterioration in the distribution of income. Government expenditures tend to improve the distribution more than the taxation because excessive taxation exploits the working class by hitting their incentives negatively thus jeopardizes labor participation and deters inclusive growth. But at the same time, the economy has to face another problem, that is, an increase in expenditures without raising fiscal revenue may threaten fiscal sustainability while maintenance of fiscal sustainability is the key issue in most of the developing countries.

However, Roed and Strom (2002), while analyzing the progressive income tax and the resulting situation in the labor market give the remark that the trade-off issue between income equality and efficiency may be evitable through three forces. Among these three forces, the first is that labor supply is relatively more elastic for low-wage workers as compared to highly-paid workers, thus progressive tax brings in the efficient allocation of the tax burden. Secondly, progressive taxation reduces the level of unemployment by moderating the wage if the labor market is not competitive and thirdly, the progressive tax may increase the demand for less-skilled workers to avoid redistribution of wages. Berg and Ostry (2011) are of the view that high inequality reduces the duration of economic growth while at the same time an inappropriate policy to reduce inequality hampers the growth objectives and may become more harmful to the economy. An

adequately designed policy, for example, subsidies that are targeted to alleviate poverty, and provision of educational facilities to the poor section of the economy carry with it equal economic opportunity and promote employment.

Taxes and transfers both can help to make a noticeable correction in income distribution. Bastagli et al. (2012) advocate that direct income tax and public transfers to poor households make a significant decline in the Gini coefficient. The study has been conducted for 25 OECD-members and it is observed that the averagely Gini index decreases by 15 % due to taxes and transfers. Working on the same line, Joumard et al. (2013) also attempted to explore the effect of tax and transfers on the disposable income gap in the OECD countries and it is examined that tax and transfers are successful instruments to reduce the gap while the magnitude of the effect was different in different countries. However, Cournède et al. (2013) observed that taxes and transfers could not maintain their redistributive role in the past decade and therefore, cannot be efficacious instruments to overcome inequality and poverty.

Government expenditures can do a lot more to protect the poor section of the economy. Cournede et al. (2013) are of the view that a considerable improvement in the distribution of income is possible if the government spending more on pensions. Among the available fiscal policy options, public pensions have greater potential to reduce inequality because of their progressivity (Claus et al., 2012). A lot of studies are available in the literature that highlights the positive role of government expenditures in lifting the economic growth level (Ratner, 1983; Ram, 1986; Mundiale, 1992; Morrison & Schwartz, 1996; Al-Fawwaz, 2016; and Alshahrani and Alsadiq, 2014). Examining the relationship between government expenditure and inclusive growth for the Nigerian economy,

Kolawole (2016) explains that public expenditures are effective to break the poverty cycle. For this to happen, expenditures should be pro-poor, that is, expenditures should be made on infrastructure, education, and health. David and Petri (2013) conduct a study on the economy of Mauritius and realize that though income tax is progressive, but, its effect of redistribution is minimal. However, government expenditures play a vital role in correcting distribution while at the same time affects the economic growth rate positively. Public expenditures can make the economy conducive to grow and flourish if it brings improvement in human and physical capital.

Among different types of taxes, income tax is assumed to have a progressive and redistributive effect (Hoeller et al., 2014). A temporary decrease in income tax puts an immediate effect on the incentive to work and raises savings and thereby causes an increase in aggregate output. Most beneficiaries of tax cuts and tax rebates are low-income households (Kitao, 2010). Thus, the tax affects both economic growth and its distribution. Mertens and Ravn (2013) provide empirical evidence that a significant effect on short-term output can be observed by making a change in corporate and personal income taxes. Akitoby (2013) supports the idea that inequality in income distribution can be reduced if the high-income group is imposed with a tax that is more progressive. However, this increase in income tax may cause individuals to evade taxes.

2.4 Monetary Policy and Inclusive Growth

Literature is full of arguments that monetary policy is effective for the sustenance of economic health. Tools of monetary policy are frequently used to adjust the inflation rate, interest rate, and employment. Bernanke and Gertler (1995) and Mordi and Adebiyi

(2011) attempt to identify the transmission channels by which monetary policy affects the macroeconomic variables such as inflation, growth, the balance of payments, employment, and sustainable development. The transmission channels are interest rates, exchange rates, and asset prices. Adediran et al. (2017) examine the effect of monetary shocks on inclusive growth and confirms that monetary policy can effectively contribute to economic stability. Monetary tools affect interest rates which in turn affects the consumption and investment decisions of individuals. Thus, by affecting the aggregate demand, the adjustment in monetary policy brings in macroeconomic stability. Chang and Jaffar (2014), while analyzing the Korean economy, are of the view that monetary policy, through interest rate mechanism, adjusts employment rate to the level that ensures inclusive growth.

Some studies highlight the importance of monetary instruments in affecting income distribution. Albanesi (2007) and Li and Zou (2002) provide empirical evidence that monetary policy by affecting the inflation rate makes changes in the distribution of income because inflation and income inequality are positively related. It is a general belief that during the process of growth, income inequality increases, monetary policy, therefore, can be used to maintain a stabled inflation rate and consequently monetary policy and inclusive growth are indirectly and positively related. Simplice (2012) works on the same conception and concludes that monetary policy affects growth and income distribution positively thus ensures sustainable and equitable growth in the economy. Monetary policy also affects the availability of funds to consumers and investors and thereby helps in generating employment opportunities and raising the standard of living.

A comprehensive monetary policy can also have the potential to influence an individual's wellbeing. The monetary policy decision regarding cost and credit availability affects welfare. Monetary policy that increases aggregate demand helps in reducing the credit costs and takes the investment to a higher level and thus results in an increase in the output, employment, and individual's wellbeing. Working on the same idea, De Paoli (2009) analyzes the impact of monetary policy on the welfare of small open economies and examine that based on utility, the loss function depends on the output gap, inflation, and real exchange rate and concludes the relative effectiveness of monetary policy in increasing welfare. Aoki (2001) is of the view that if in an economy there are distortions due to price stickiness and import prices truly and immediately reflects changes in the exchange rate, and then to maximize the welfare, the target of monetary policy should be to stabilize producer price index.

Mostly the economic policies have been focused on stabilizing prices in the economy because it lessens economic uncertainty and offers a promising milieu for economic growth and employment over the long term. A lower level of inflation brings with it the protection of purchasing power that helps individuals in maintaining living standards. Jhingan (2004) explains that ceteris paribus, an expansionary monetary strategy, by increasing aggregate demand, puts a direct and positive impact on output growth. Nzekwu (2006) also highlights the importance of monetary policy in adjusting aggregate demand and explains that during the time of excessive demand, when the economy faces the jeopardy of high prices, a monetary restriction can do an inordinate job while monetary expansions are effective in the periods of low demand.

Besides the positive influence on the economy, monetary policy may also have an inadvertent negative impact on inclusive growth. There are so many ways through which the problem of inequality in income may prevail when the policymakers use tight monetary policy to target a low level of the inflation rate. For example, one of the ways is to use monetary policy to reduce output in the short run to create dis-inflations. The reduction in output causes an economic environment with an increased unemployment rate and hits the poor section mostly and causes a huge gap to develop between the haves and have nots and thus put the idea of inclusive growth to an end. Thus, the cost associated with dis-inflation often outweighs the gains (Dholakia and Virinchi, 2017). However, the extent of loss in terms of unemployment and inequality caused by dis-inflation depends on, among many factors, the independence of the central bank. Walsh (1995) provides empirical evidence on the relationship between the independence of the central bank and the cost of dis-inflation and suggests a positive relationship between the two and makes the tradeoff between output-inflation responsible for causing the positive relationship between independence of central bank and cost of dis-inflation.

Many studies prove the existence of a link between the cost of dis-inflation and the speed of adjustment. Taylor (1983) in his study finds that a slow dis-inflation is relatively less costly and explains that wage and price inertia make the speed slow. There are also theoretical arguments suggesting the contrary. Contrary to these findings, Sargent (1983) have an opposite opinion and says that a quick dis-inflation is less costly because a quick regime shifts result in credibility and thereby causes expectations to adjust speedily, whereas, a gradual disinflation creates uncertainty and causes adjustment of expectations difficult. Working on the same idea, Ball (1993) conducts an empirical cross-country

study to relate the extent of sacrifice ratio (the percentage of the total output loss due to change in inflation trend) with the speed of dis-inflation and finds an inverse relationship between the dis-inflation speed and sacrifice ratio.

2.5 Interaction of Monetary and Fiscal Policies

Literature is full of discussions that highlight that fiscal and monetary policies have the potential to correct and address a number of macroeconomic issues. Regarding the effectiveness of policies in boosting up the growth of national income, correcting the distribution pattern and poverty, many of the researchers put their vote for fiscal policy while some others support monetary policy. It is observed that in any economy, it is not possible to rely on only one of the policies to carry out solutions to all economic problems simultaneously. Both the policies go side by side and these policies can affect the consequence of each other. Thus, this is the reason that why many of the researchers have put their efforts into highlighting the interaction of monetary and fiscal policy so that the economies struggling to have a grip on their economic problems could have some insight into the way policies are interlinked and their relative effectiveness.

In a policy framework, changes in fiscal policy are expected to affect inflation and thereby on the interest rate. Therefore, while setting the interest rates, the central bank has to keep into consideration the effect of fiscal policy on aggregate demand and thus inflation. Sprinkel (1963) suggests that to avoid risky economic fluctuations, both monetary and fiscal policy should be used. Wyplosz (1999), Melitz (2000), and von Hagen and Mundschent (2003) provide empirical evidence that monetary and fiscal

policies move opposite to each other, that is, a tight monetary policy is needed in response to expansionary fiscal policy and vice versa.

Sargent and Wallace (1985) explain in their work that monetary policy can work efficiently only if the fiscal policy in that economy is sustainable. In their study, they define two regimes namely, "monetary dominant" and "fiscal dominant". The former, as the name indicates is about the situation where monetary authority can set its policies independently while the latter indicates the independence of fiscal authority in setting budget, deficits, and revenues. In this regime, monetary authority fails in controlling inflation if the real interest rate exceeds the economic growth rate.

On the other hand, Leeper (1991) explains that monetary and fiscal policy can be characterized as active and passive based on inter-temporal constraints faced by the policy authority. Fiscal policy is known as passive policy if the policy authority makes changes in taxes in the response shocks to government debt, however, the policy will be termed as active or forward-looking if the spending and taxation decisions are made independent of the inter-temporal budget constraint. Same in the way, monetary policy is active if it follows the inflation targets autonomously whereas a backward-looking monetary policy focuses on setting interest rates following the fiscal policy objectives. Davig and Leeper (2011) in their study explain how the combination of monetary and fiscal policy affects the economic variables and it has been analyzed that policies switch from active to passive and from passive to an active state. An active monetary and passive fiscal strategy leads to crowd out the private consumption as a result of an increase in government consumption and makes wealth effect negative due to increased future tax while interest rate increases due to monetary action.

To draw attention to the interaction between and monetary and fiscal policy in the emerging countries of the European region, keeping in view the concept of a monetary policy rule by Taylor (1993) and fiscal policy rule used by Davig and Leeper (2005), Cevik et al. (2014) examine that countries like Poland, Hungary, etc. are pursuing both the active and passive monetary rule whereas the Slovak Republic and Slovenia are following the passive monetary rule. Hilbers (2004) put an effort in explaining the direct and indirect means through which fiscal policy can affect the monetary policy. The direct channel is through seigniorage, that is, a loose fiscal policy resulting in fiscal deficits may lure the government to print money to finance deficits. The resulting loose monetary policy fuels up inflationary pressures and thus affects the balance of payments. The government may have the option to finance the deficits through local funding but it can crowd out the private sector and hence economic growth gets suffered while the option of foreign funding may cause balance-of-payments risk. The imposition of indirect taxes also causes inflation to level up and affecting the wage-price spiral affects inflationary expectations. The indirect channel is through the expectation of outsized budget deficits that results in the requirement of large borrowings and hits the stability of financial markets, thus, the monetary regime collapses. Thus, coordination among fiscal and monetary authorities regarding their financial activities is required.

In their study, Baldini and Ribeiro (2008) argue that fiscal policy can affect inflation and money creation is not the only reason. The theory of dynamic inconsistency helps in understanding how the monetary base is affected by fiscal policy. The government wants high inflation to make the real value of unsustainable debt low and to finance its expenditures through the printing of money. Thus, fiscal policy influences the efficacy of

monetary policy by affecting inflation. Mohanty and Scatigna (2003) have the opinion that fiscal policy affects interest rates because high deficits in budget cause interest rates to be high on financial assets. The increasing debts and deficits hamper the growth process and make it difficult for the government to service debts, thus, the credit risk premium rises.

2.6 Index of Financial Inclusion

The literature discusses different methods to develop the index of financial inclusion. It is normally assumed that the financial system is inclusive if the maximum of the individuals living in a society has bank accounts. But this assumption is not logical because having an account does not ensure adequate utilization of the account (Kempson et al., 2004). The meaning of financial inclusion is not limited to the number of accounts owned by people rather it is about the better utilization of these accounts and financial services offered by the financial sector. People may find it difficult to utilize bank accounts due to transportation issues or other psychological barriers. Diniz et al. (2011) conduct a case study on people of Autazes and examined that people find it difficult to use bank accounts as it is expansive and consumes so much time. Seidman et al. (2005) carry out a survey based on a large number of households and concluded that two-thirds of the population having their accounts in banks were using non-bank services.

In an attempt to develop the index of financial inclusion, Sarma (2010), based on the UNDP approach, introduce a multidimensional measure that quantifies the extent of financial inclusion in an economy. The index ranges from zero to one where a zero value indicates perfect financial exclusion whereas a value of one indicates perfect inclusion.

The dimensions used to construct the index were availability of the banking services, banking penetration (number of people having bank accounts), and usage of the banking system. Sarma (2010) modifies the index by financial inclusion by assigning different weights to three dimensions. The weight for banking penetration is 1, and for usage and availability of services 0.5 weight has been assigned. Sarma (2012) modifies the methodology to construct the index whereas dimensions were the same.

By using an axiomatic approach, Chakravarty and Pal (2010) develop a measure of financial inclusion. The axioms considered for financial inclusion are boundedness, global monotonicity, global homogeneity, symmetry, and "global lower difference in gain at higher levels of attainment difference." The study uses eight indicators, namely, geographic branch penetration, demographic branch penetration, Geographic ATM penetration, demographic ATM penetration, credit accounts per capita, credit-income ratio, deposit accounts per capita, deposit-income ratio. The main focus of the study has been to measure the access to financial services and its use. Based on the same methodology as discussed by Sarma (2012), Yorulmaz (2013) puts an effort to construct a multidimensional index to measure the inclusiveness of the financial sector across regions and provinces of Turkey.

AFI (2011) measures financial inclusion and discussed the core set of indicators of financial inclusion. The two important dimensions of financial inclusiveness are access to finance and usage. The indicators of access dimension include "number of access points per 10,000 adults at a national level segmented by type and administrative unit, percentage of administrative units with at least one access point, percentage of the total population living in administrative units with at least one access point." Indicators of the

dimension usage are "percentage of adults with at least one type of regulated deposit account, percentage of adults with at least one type of regulated credit account." A study by Dixit and Ghosh (2013) examines the impact of the inclusive financial sector on inclusive growth and identify several indicators. The indicators are accounts owned by individuals, accounts owned by females, accounts income bottom 40 percent, salaried accounts, accounts to receive payments by the government, accounts for remittances, savings with financial institutions, saving clubs, loan borrowed from financial institutions, a loan from family or friends, debit cards and credit cards. Using data on these indicators a comparison was made to check the extent of inclusion in different countries but the data for only a few countries was available which made the analysis weak one similarly data on loans from family or friends cannot be collected accurately.

In Literature, both the parametric and non-parametric approaches have been used to make the financial inclusion index. In non-parametric methods, subjective weights are assigned whereas in parametric approaches, weights are determined endogenously based on the information of indicators. Mialou et al. (2017) use common factor analysis (CFA hereafter) on only supply-side data. However, Cámara and Tuesta (2014) attempt to develop a multidimensional index of financial inclusion for 82 countries using PCA in two stages, weights were assigned to make an index, whereas the dimensions are access, barriers, and usage. The indicators of access are accounts, savings, and loans; indicators of barriers are distance affordability, documentation, and trust; indicators of usage are ATMs and bank branches per population (adults) and per square kilometer. In this study, PCA was preferred over CFA because PCA does not make assumptions related to the raw

data. Data set from both demand and supply-side have been utilized because using only the supply-side data can overestimate the facts.

Many economists try to check the level of financial inclusion at the regional level. Revathy and Maheswar (2015) make a great attempt to analyze the extent of inclusion among females in the rural area of the Tirunelveli district, an Indian state. Financial inclusion has been evaluated through four different sources that are, banks, insurance, post offices, and self-help groups. Based on primary data, this study concludes that the level of inclusion of females is very low, while an active involvement by females in availing financial services can assure better economic empowerment. Bhuvana and Vasantha (2016) identify the dimensions of inclusive finance in Tamil Nadu. This study is conducted particularly for rural areas and the dimensions are branch penetration, credit Penetration, deposit Penetration, and model of the business correspondent. It was examined that maximum of the districts of Tamil Nadu has an average or higher level of inclusion.

2.7 Financial Inclusion and Inclusive Growth

Financial barriers are considered to be one of the main factors that cause an increase in poverty. Removal of financial barriers can help the poor section of the economy to get out of the poverty trap (Demirgüç-Kunt et al., 2007), thus an inclusive financial system is much needed for an economy to remove poverty. According to the IMF, financial inclusion is a system that makes sure the availability and accessibility of financial services to all individuals, mainly to the deprived section of the economy. An inclusive financial system can be pro-growth as well as pro-job. Leyshon and Thrift (1995) stressed

on the fact that financial exclusion makes access to the financial system difficult for poor and socially neglected groups. Kakwani and Pernia (2000), Beck et al. (2004), and Clarke et al. (2003) provide evidence that an inclusive financial system plays a vital role in reducing poverty and income inequality and hence promotes inclusive growth. Easy access to financial services makes the poor able to shield themselves against unfavorable shocks and thus helps to increase their welfare.

The financial system helps the economy to build up a strong base for economic growth. By making it possible for all individuals living in an economy to have easy access to financial services, the financial system enables the maximum of the individuals to participate in the growth process. Individuals, due to financial services, can have more economic opportunities and choices at their disposal, thus, resource allocation improves. Banerjee & Newman (1993) explain that availability and easy access to financial resources enable the maximum number of individuals to have access to education and promote self-employment. Thus, economic growth increases, human development improves and poverty alleviates. The growth of an economy cannot be inclusive if its financial system is not inclusive (Chakrabarty, 2011). Hannig & Jansen (2010) provide evidence that the development of the financial sector has a significant impact on poverty reduction and make economic growth equitable. Jahan and McDonald (2011) are of the view that financial development makes economic growth faster and improves income distribution. The financial depth gauged by private credit as a percentage of GDP and access to finance determined by the number of bank branches is observed to benefit the rich initially but as the financial sector progresses inequality reduces at a sharp rate. Burgess and Pande (2005) observe that with an increase in access to financial services in

rural India, output increased and poverty declined. On the other hand, a work by Mylenko (2009) finds that in the times of global crises, access to finance worsened in many economies.

Schumpeter (1911) stressed the fact that the development of the banking and financial sector brings with it technological advancements by providing funds to the entrepreneurs who are motivated enough to introduce innovative products in the market. Hicks (1969) highlighted the importance of the financial sector in spurring the process of urbanization since the developed financial system facilitates capital mobilization to the masses. Levine (1997) conjectures that the development of the financial sector plays a vital role in long term economic growth. Countries having strong and active banking and stock markets experience a faster growth rate. An accessible financial system reduces the cost of transaction and information and thus affects investment decisions and technological innovations.

It is observed that developed countries have an inclusive financial system, whereas developing countries have a financial system that is less inclusive. According to a report by World Bank Group (2013) on financial inclusion, half of the world's adults do not have formal bank accounts while the maximum of them belong to developing countries. Kendall et al. (2010) examine that in developed countries, 81 percent of the population have their bank accounts while in developing countries only 28 percent have their accounts with commercial banks. Cull et al. (2013) also conducted a study and provide empirical evidence that out of the world's total adult population, half is unbanked and more of this unbanked population belongs to developing countries. However, financial inclusion in these countries has been measured through the number of individuals having

accounts, savings, and borrowings from formal institutions. Demirguc-Kunt and Klapper (2013) work on demand-side data and discuss the usage and also barriers to financial indicators and observe that seven countries of developing Asia comprise approximately 92 percent of the total unbanked people and Pakistan is one of them.

This section of literature reviews highlights that inclusive financial structure helps the economies to make their economic grounds strong and makes the growth inclusive by providing funds to maximum individuals, helps them to make investment decisions, and increases the opportunity for low income and socially neglected groups to participate in and get their share from the growth process.

Gap Analysis

Keeping in view the above literature on inclusive growth, the present study concludes that since 2007, many researchers have endeavored to conduct studies to formulate an appropriate measure of inclusive growth but still they couldn't come up with a measure on which most of the researchers could agree. Since inclusive growth is a broad concept that covers different dimensions of the economy, we need to go an extra mile in this study to formulate an index of inclusive growth that addresses the growth and inequality issues by considering the economic, social, and environmental dimensions of the economy. As far as the factors that ensure the inclusive growth are concerned, the literature suggests that fiscal variables such as tax and expenditure and monetary policy variables such as money supply and interest rate are effective in making the growth inclusive but most of the literature ignores to highlight the role of macroeconomic policies on different dimensions of inclusive growth. It is also observed that studies in the

past have been carried out to gauge the composite impact of fiscal and monetary policy on economic growth but the combined impact of these policies on inclusive growth and its dimensions is the area that is missing in the literature. Moreover, while searching for the determinants of inclusive growth, many studies have analyzed that countries with a strong financial sector tend to have effective monetary policy and growth that is more inclusive. Therefore, this study evaluates whether financial inclusion can affect the level of effectiveness of the monetary policy. Thus, this study endeavors to bridge the above-mentioned gaps in the literature.

CHAPTER 3

METHODOLOGY AND DATA

This chapter explains the methods used in this study to achieve the objectives that are stated in the introduction section. Section 3.1 of this chapter explains how the concept and the need for inclusive growth emerged and what areas should we cover in inclusive growth. Section 3.2 is about the measurement approach for an inclusive growth index where suitable dimensions of inclusive growth with their indicators have been suggested based on discussions in section 3.1. Section 3.3 describes how the conventional views regarding macroeconomic policies and the existence of inclusive financial structure help to achieve inclusive growth and thus theoretical framework has been developed. The construction of the index of financial inclusion is discussed in section 3.4 while section 3.5 is about the construction technique of composite index and section 3.6 explains the empirical technique to analyze the impact of macroeconomic policies and inclusive finance on inclusive growth. Section 3.7 discusses the description of variables.

3.1 Conceptualizing Inclusive Growth

The issues related to growth, income inequality, and poverty have remained part of many economic and development discussions, however, the idea of inclusive growth emerged about a decade ago. The early post-world war theories, for example, Solow (1956) and Kuznets (1955), were primarily focused on growth process and efficiency while equity issues, such as income inequality and poverty, were given secondary importance that would be dealt with in the later stages. The growth model developed by Solow (1956) while highlighting the significance of technological change discusses the relationship

between growth, income inequality, and poverty and through the trickledown effect expects a spontaneous fall in poverty. Solow's model explains that poor countries grow faster and have a tendency to converge with the rich world. But this argument of convergence of poor economies and the appearance of the equality-oriented growth process in the world was criticized heavily in the 1970s when most of the economies belonging to the poor core of the world failed to converge with the developed world and no improvements in income distribution have been observed.

Chenery et al. (1974) drew the attention of the policymakers towards redistribution and highlighted that poor sections of the economy are not able to get their share equitably from growth due to deficiency of capital. Over the time, it was realized that growth led by capital-intensive processes lead the economy towards the unequal distribution of income and wealth therefore focus of the World Bank shifted towards encouraging labor-intensive production techniques and to enhance the productivity of the labor, policies regarding education, health, and other related services were suggested. The great recession of the 1970s followed by the debt crisis of 1980s, when most of the developed nations increased the rate of interest on the lent money to mitigate the effects of the recession in their country caused an increase in the debt burden of many developing countries with Latin America an increase of more than 1000 percent in the debt level, resulted in the emergence of the Washington Consensus (Britannica, 2012).

To overcome the debt burden, IMF and other financial institutions suggested structural reforms to these countries but instead of cutting the subsidies given to enterprises, many of the developing nations opted for the strategy of reducing expenditures on development expenditures such as education, health, and infrastructure that, in turn, resulted in low

economic growth and high unemployment. Thus, in 1989, Washington-based institutions designed a policy package that mostly favored the monetarists' approach. The main idea was to promote free trade, macroeconomic stability, and the free market. The market-led strategies were believed to enhance the growth and the benefits of growth will trickle down to all but this didn't happen in real, whereas the financial institutions blamed the poor implementation of the countries for the failure. However, the post-Washington Consensus emerged and Stiglitz and other proponents of institutional economics came into sight. The advocates of the Post-Washington Consensus reject the neo-classical approach of the free market and highlighted the importance of institutional reforms to make economic activities and growth process smooth. They also believed that poverty reduction is possible if the growth of employment is accompanied by economic growth.

The opponents of the Post-Washington consensus argue that the role of institutions has been exaggerated and the development-oriented institutional reforms are difficult to be implemented in poor economies with weak institutions. The late 1990s focused on the idea of pro-poor growth and realized that the problem of inequality and poverty is the root cause of political, social, and economic restlessness and therefore needs to be addressed directly rather than leaving poverty reduction on the mercy of growth achievements. Kakwani and Pernia (2000) defined Pro-poor growth as a rise in the share of the poor in total income. The proponents of Pro-Poor Growth are of the view that there should be rapid growth and at the same time greater equity.

The debate on pro-poor growth and suitable policies to ensure it led the researchers to talk about the new concept of inclusive growth in the late 2000s. Ianchovichina & Lundstrom (2009) explained the notion of inclusiveness in terms of the provision of

equal opportunity to all to participate in the growth process. Inclusive growth is an idea that is different from the concept of pro-poor growth because the former focuses on growth that benefits all the individuals of the society from the poor to the rich while the latter focuses on benefiting individuals living below the poverty line. Grosse et al. (2008), McKinley (2010), Klasen (2010), and Rauniyar and Kanbur (2010) in their studies talked about the non-income dimensions of inclusive growth. The current study follows the work of McKinley (2010), in which an inclusive growth index has been constructed using weights to different income and non-income indicators of inclusive growth. The indicators of inclusive growth used in his study are divided into four main categories, that are, 1) growth, productive employment, and infrastructure; 2) poverty and equity; 3) human capabilities and 4) social protections. Some of the indicators of these four categories indicate the participation of people in the growth process whereas some of the indicators indicate the equality of outcome.

3.2 Measurement Approach for Inclusive Growth

The existing literature suggests methods to measure or construct the index of inclusive growth. Each of these methods has its pros and cons so one of the objectives of this study is to construct an appropriate index of inclusive growth for developing countries. Before the construction of any index, the priori step is to understand the concept and then and find the appropriate indicators that are strong candidates to quantify the concept. Following the understating of the concept of inclusive growth in section 3.1, this section discusses an appropriate method and its rationale to develop an inclusive growth index (IGI). The methods and factors used to construct IGI in the past have already been

discussed in the literature review section. A summary of frequently used indicators is given in Table 3.1.

Table 3.1: Frequently Used Indicators of Inclusive Growth

S. No	Indicators	Source
1	a) Employment opportunities & productivity b) Education & health c) Social-safety nets & targeted interventions	Ali & Son (2007b)
2	a) Income growth b) Income distribution	Annand et al. (2013)
3	a) Access to employment & infrastructure b) Equity & poverty c) Human capabilities d) Social protection	McKinely (2010)
4	a) Economic growth b) Employment c) Infrastructure d) Poverty e) Gender equity f) Human capability g) Social protection	Enang & Bassey (2016)
5	a) Economic growth b) Job opportunities c) Income inequality d) Poverty e) Health & education f) Social security	Min & Xiaolin (2012)
6	a) Poverty b) Inequality c) Employment	Ramos et al. (2013)
7	a) Economic growth b) Poverty c) Income distribution	Foster (2015)
8	a) Income b) Life expectancy c) Education	Haung & Quibria (2014)

9	a) Indicators of economic growth b) Welfare indicators (Health & Education)	Tapsoba & Tapsoba (2014)
10	a) Income b) employment c) Longevity	Boarini et al. (2015)
11	a) Employment b) Education	Asghar & Javed (2011)
12	a) Income b) Income inequality	Tirmazee & Haroon (2015)
13	a) Economic dimensions b) Social dimensions c) Environmental dimension	Wan & Zhuang (2015)

3.2.1 Dimensions of Inclusive Growth

Keeping in view the concept and mechanism of inclusive growth, the current study devices three dimensions of inclusive growth, that is, economic, social, and environmental dimensions. IGI (Inclusive Growth Index) is a complex and composite index that looks at all aspects of growth. This study is an attempt to construct an index in such a way that it could cover all the possible dimensions of growth that are crucial for making economic growth inclusive. Literature highlights that most literature has been focusing on economic and social dimensions only for inclusive growth but Wan & Zhuang (2015) considered the entire three dimensions of inclusive growth. The measures of dimensions taken in this study are different from the indicators discussed in Wan & Zhuang (2015). The details of indicators of these dimensions are as under in Table 3.2.

Table 3.2: Dimensions and Indicators Used to Measure Inclusive Growth

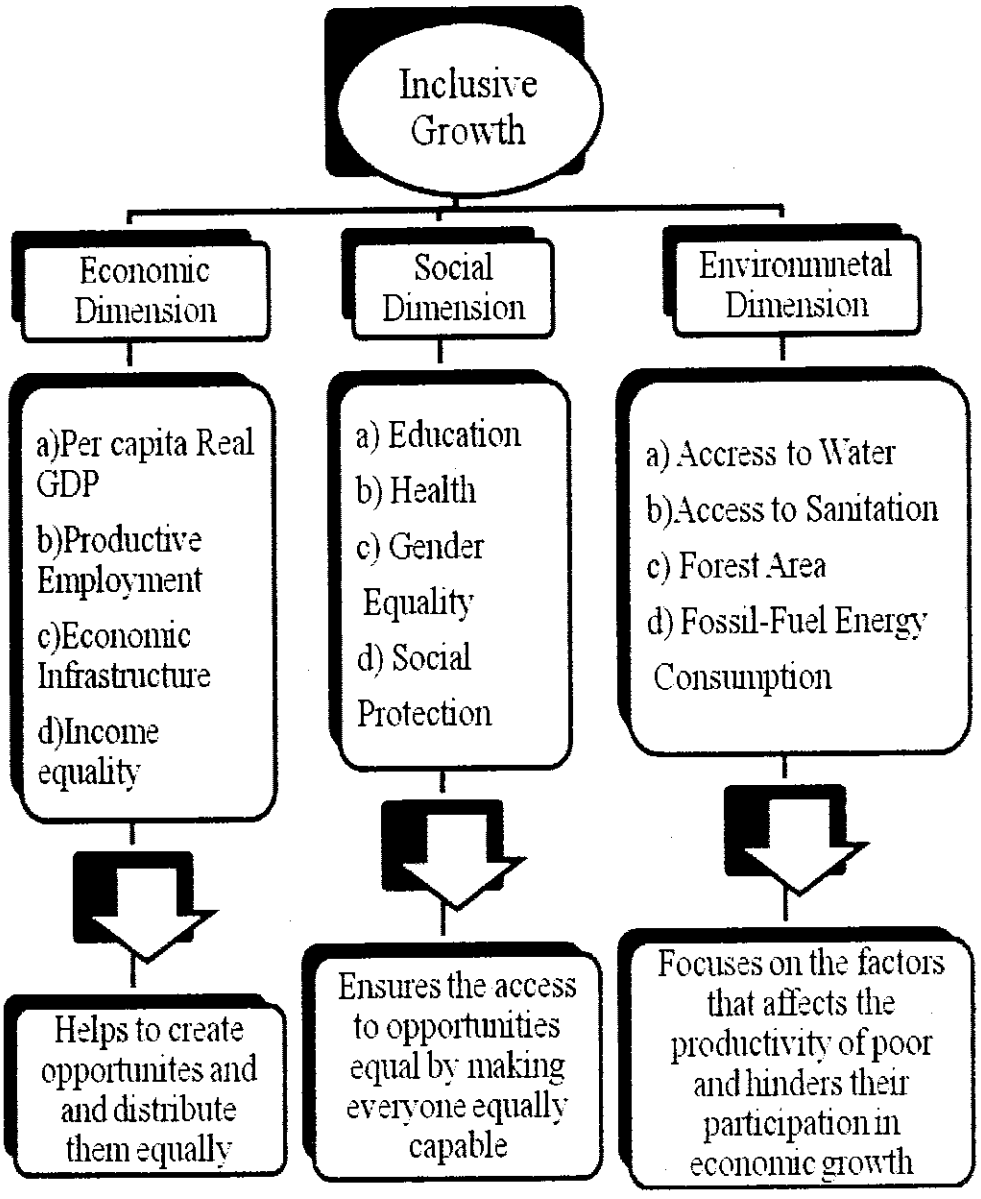
S. No	Dimension	Indicators
1.	Economic dimension	a) Growth of per capita income b) Productive employment c) Income distribution d) Infrastructure
2.	Social dimension	a) Education b) Health c) Social security d) Gender equity
3.	Environment dimension	a) Sanitation b) Water sources c) Forest area d) Consumption of fossil-fuel energy

Source: Authors' view

Figure 3.1 gives a better understanding of how the dimensions of inclusiveness lead to greater access to opportunities and growth benefits by individuals. The economic dimension helps to create opportunities for all to participate in the growth process by providing infrastructure and productive employment. It also takes into account the distributional aspects of growth benefits. the social dimension helps the socially neglected and marginalized group to have access to opportunity by making them equally capable. However, the environmental dimension considers the environmental factors such as safe drinking water, sanitation and pure air, lack of which may affect the productivity of unprivileged group and ultimately hinders their participation in the growth process.

Thus taken into account the above discussed dimensions, our inclusive growth index covers all the possible aspects that promote the active participation of the masses in economic activities.

Figure 3.1: Dimensions of Inclusive Growth



Source: Author's construction

3.2.1.1 Economic Dimension

The economic dimension includes the growth of per capita income, employment rate, reduction in income inequality, infrastructure. Many researchers emphasize that inclusiveness of growth indicates the creation and access to economic opportunities (Ali and Son, 2007b; Adedeji, Du and Opoku-Afari, 2013 and Pal, 2014). The growth rate of per capita income is a basic component that helps in advancing inclusive growth because it is the root of the expansion of economic opportunities.

The second measure of the economic dimension is the employment rate. Growth will be inclusive if the maximum of the individuals living in an economy has the opportunity to participate in the growth process. Jobless economic growth is nothing but a threat to a society having increasing population growth because it makes the economic situations hard-hitting for the poor and thus makes them helpless to fight against poverty. Therefore, the growth of the economy needs to be paired with job creation. GDP growth rate in low and middle-income countries was 4.9 percent with an unemployment rate of 5.4 percent while specific to South Asia the figures for GDP growth rate and unemployment have been 6.48 and 3.72 respectively in 2017 according to WDI. In the case of Pakistan, with an increasing fertility rate, the economy of Pakistan is facing the problem of youth bulge[7]. This cohort of youth, if remained unemployed, will become a bomb that will hit the political and social stability of the economy massively. Thus, the rate of employment is supposed to be tied up with the population rate.

[7] The Dawn, "The Pakistani youth bulge: A ticking time bomb", June 25, 2017.

The third indicator of the economic dimension is income distribution. The literature is rich in studies that evidenced the trade-off between economic growth and inequality of income (Benhabib, 2003; Qiao et al., 2002). While some economists including Barro (2000) and Keskin (2017) highlighted that impact of income inequality on growth is depressing in low-income countries while the case is the opposite in rich countries thus the relation depends on the economic status of the country. This in a way or other link between growth and income distribution provoked economists to think about inclusive growth. Thus, growth will be inclusive if it improves income distribution. The fourth indicator of the economic dimension is infrastructure. The participation of individuals in the growth process and the distribution of growth benefits to mass require a well-established infrastructure of the economy.

Inclusiveness of economic growth will reach an appropriate level if it causes the maximum number of individuals to have access to transportation and communication services. Individuals living in far-flung areas are deprived of access to market and other economic opportunities due to poor and costly transportation services whereas the lack of a proper communication system gets in the way of the access to market and other economic information that resultantly discourages their production activities. These individuals will have access to the market only if they have better access to economic infrastructure.

3.2.1.2 Social Dimension

Inclusive growth also focuses on the social welfare of individuals and their access to social goods like education health etc. This dimension emerged because inequality exists

beyond income. According to World Bank (2013), social inclusion is about working on those factors that help the disadvantaged group of the society to improve their ability, dignity, and opportunity so that they could play a part in society, therefore, all the individuals in the economy are required to be provided with resources and services so that they all could be equally capable to ensure social inclusion. The social dimension of inclusiveness of growth includes education, health, social security, gender equity.

It is a well-known fact that a person with an educational degree will have a better earning opportunity than an uneducated person because education and knowledge help in increasing the skills and productivity of the individual and consequently accelerates economic growth. But the availability of educational services is beyond an individual's control. Secondary school enrollment in low and middle-income countries is 62.309 whereas in high-income countries the ratio is 92.7. In Pakistan, 22.6 million children are not enrolled in school. The infrastructure of schools and the quality of education being provided by the government are so pitiable. Many studies have used the school enrollment ratio at the primary and secondary levels to measure access to education. The second indicator of the social dimension is the access of the population to health services. Health creates a positive externality in society and improves the efficiency of the labor force. Therefore, a better health-care system is necessary for both welfare and economic growth. Without the support of the public sector, health services will be affordable to only the rich class (Akram and Khan, 2007). The more the population has access to better health services, the more valued will be the human capital. In this study, inverse of mortality rate is used to measure the condition of health in the economy.

The third measure of the social dimension is social security. Social protection of an extremely poor section of the economy is a necessary element to make society inclusive. The provision of social-safety nets helps in eradicating poverty and makes the opportunities available to the extremely poor. Public social protection expenditure as a percentage of GDP is used as an indicator of social protection. The fourth indicator of social inclusion is gender equity. When it comes to the inclusiveness of growth, there should not be any discrimination among females and males. Inclusiveness requires participation from maximum individuals regardless of their gender and the distribution of the growth benefits also requires to be reached to every person irrespective of their gender. The Report presented by Wan & Zhuang (2015) explored that the gap in education across gender is high in Pakistan as compared to other Asian and Pacific countries. Likewise, there exists a gap in male and women participation in the labor force. There also exists a difference in the income of male and female labor participants. Since inequality across gender mainly arises at their school-going age, that is, if a woman is made deprived of education facilities then automatically her participation and earnings will be affected as well thus index of gender parity (primary school enrollment) is used to measure gender equity.

3.2.1.3 Environment Dimension

The urge to have fast economic growth led many economies to ignore the resulting environmental degradation. It is a generally agreed statement that economic growth and poverty cause the environmental quality to be affected negatively (Costantini and Martini, 2010). World Bank (1992) presented the notion of development-environment nexus that explains the two-way causal relationships between the two. Some studies have

examined that economic development to have a positive impact on upgrading environmental quality in terms of improvements in safe drinking water and sanitation facilities whereas the air pollution and emission of sulfur oxide cause the environment to degrade (Shafik, 1994). Just as the relationship between economic growth and income distribution, there also exist environmental Kuznets curve that explains the inverted U-shaped relationship between degradation of the environment and per capita income, that is, in the initial stages of growth, environment degrades, while higher per capita incomes are accompanied with improved environmental quality (Stern et al. 1996).

On the other hand, environmental conditions also affect economic growth and the low quality of environment prevents many people to contribute to the growth process by affecting their productivity. The poor section of the economy is less resilient to the harmful effects of environmental degradation hence the provision of a safe and green environment to everyone makes individuals get equal opportunities to take part in the growth process. The exposure of the human body to hazardous particles in the water and air is the cause of many diseases and thus decreases their productivity by affecting their health condition. People living in rural areas mostly rely on energy resources that emit carbon dioxide, for example, solid fuels. A report by WHO (2011) emphasizes the matter that in developing countries the cause of young children's mortality and chronic pulmonary diseases among adults is indoor combustion of fuels and be short of access to advanced energy resources. Thus to have sustainable and inclusive economic growth, improvement, and maintenance of environmental quality is very essential.

The indicators of the environment dimension include access to drinking water, sanitation, large forest area, and less consumption of fossil-fuel energy as these will make an

improvement in health conditions and reduce hazardous deaths. Most of the people living in rural areas do not have access to water sources and sanitation facilities and use fossil-fuel energy whereas, with the increase in the rate of urbanization, the forest is shrinking rapidly causing the environment exposed to pollution. The World Bank indicates that in 2017, 90 percent of the population has access to water sources whereas 64 percent population has access to sanitation facilities. In low and middle-income countries around 85 percent have access to electricity whereas in rich countries almost every individual in the economy has access to electricity. The proportion of the population having access to water and sanitation in low and middle-income economies is 90 and 66 percent respectively whereas in rich countries the figure is around 99.5 percent for access to water and sanitation. According to a study by PCRWR[8], 84 percent of the total population in Pakistan is deprived of safe drinking water. The World Bank reports that 1.91 percent of the total land area in Pakistan is left as forest area while the percentage of fossil-fuel consumption has also observed a sheer increasing trend.

3.3 Theoretical Framework to Achieve Inclusive Growth through Macroeconomic Policies and Financial Inclusion

Regarding the effectiveness of macroeconomic policies in achieving the economic targets, Keynesians and Monetarists have been in the long debate. To examine the impact of macroeconomic policies on inclusive growth, there is a need to understand how the dimensions of inclusive growth are driven by the combinations of macroeconomic policy factors. Both the policy and non-policy factors can affect per capita GDP. These factors can be exogenous, for example, geography, climate, etc., and also can be endogenous, for

[8] Pakistan Council of Research in Water Resources (2017)

example, education and health, etc. Mostly these endogenous factors are affected by the policies such as the level of government expenditure on education and health affects the literacy level and health of individuals living in the economy.

Keynesians argue that in a time of recession, monetary policy alone is not sufficient and therefore restoration of aggregate demand is needed to help the economy to overcome the situation. While using the fiscal policy tools to adjust the aggregate demand, it is also important to maintain fiscal balance and trim down the public debt because unsustainable debt and high budget deficits reduce the fiscal capacity to stimulate the economy in the time of recession. Distribution of resources is one of the main concerns of inclusive growth. The way of resource distribution is linked with the provision of equal opportunities to individuals so that they could contribute to the process of production and growth. Policies related to taxation and innovations affect the growth of GDP per capita to a great extent and at the same time affect income and wealth distribution. An increase in tax on income, profits and gain that is progressive in nature and reduction in sales tax that is regressive because the poor section of the economy spends a larger proportion of its income on consumption and save less whereas the opposite happens for the rich reduces the income inequality. Hence, the tax structure and the pattern of government expenditures of an economy affect the level of aggregate demand, output, and distribution.

Similarly, fiscal policy tools can affect other non-economic scopes of inclusive growth as well, for example, the pattern of taxation and government expenditures can be designed to achieve the goals of a green environment or social stability. Green tax causes many industrialists to employ production techniques that cause less harm to the environment.

Lopez et al. (2011) explain that government spending oriented on public and social goods reduces pollution because it leads to human capital that affects environmental quality positively whereas Mohammed et al. (2019) are of the view that government expenditure can affect the environment through three effects, that is, scale, composition and technical and the first effect results in environmental degradation while other two effects put a positive impact on the environment. On the other hand, an investment in the education and health sector by the government increases the productivity of the labor force. These effects of policies have their ultimate effect on economic growth by making the population strong, healthier, and skilled and hence results in positive employment and output consequences. An increased proportion of productive expenditures in total government expenditures leads to social welfare through the provision of social protection, education, and health.

Monetarists highlighted the role of monetary policy in controlling inflation and suggested that changes in the money supply bring long-run changes in price level and nominal income whereas real output and employment changes in the short run. Monetary policy tools also affect the living standards of individuals, for example, interest rate potentially affects the saving-investment decisions and thereby affects the consumption pattern. These changes in the pattern of consumption and investment thus affect the income distribution pattern also. Adjustments made in interest rate, at the same time, bring changes in the aggregate demand, which then affects the production level, employment, and output. Interest rate adjustments also affect the inflation rate while inflation rate and income inequality are positively related (Li and Zou, 2002).

Following Monetarists' view on the potential of monetary policy to affect output and inflation, it is observed that monetary policy through its transmission channels can also affect the social and environmental dimension. Faria (1998) explains that monetary policy can affect the environment by minimizing transaction costs. Based on the *Environmental-Kuznets-Curve* hypothesis, both monetary and fiscal policy can indirectly affect environmental degradation by affecting the level of economic activities and the effect varies according to the income, that is, the effect of these policies on environmental degradation is positive in low-income countries and negative for rich countries. Xiaocang and Yaorong (2007) confirm that monetary policy through the expansion of bank credit causes an increase in physical capital and income while affects the environment negatively whereas Munasinghe and Cruz (1995) explain that macroeconomic policies through the inflation channel affects the poor and cause them to rely on marginal land resulting in deforestation. The increased consumer prices also make access to gas and electricity difficult for the poor thus they use fuelwood and animal dugs as an alternative. On the other, Combes et al. (2015) examine that in developing countries, deforestation and seigniorage being the revenue option for government, a tight monetary policy through a reduction in seigniorage can have a negative effect on environmental quality by increasing the rate of deforestation to cover missing revenues. Monetary policy through interest rate channel can also affect social and environmental dimensions of inclusive growth by affecting the investment in basic human rights, such as education, health, access to drinking water, and sanitation.

Along with stable macroeconomic policies, the availability of financial resources can affect the growth process by affecting the accumulation of capital and technical progress.

While analyzing the relationship between financial development and economic growth, the concept of financial inclusion caught the attention of researchers in the early 2000s that is one of the integral dimensions of financial development. The financial sector becomes inclusive if it provides easy and affordable access to its financial product and services for all individuals so that they could meet their financial needs. Levine (1997) on the discussion on the role of financial development stresses that the intensity of financial depth can affect an economy's pace and pattern of development and growth. While linking finance and growth, Levine explains that financial markets are developed to remove the frictions in the market created due to information and transaction costs. These financial markets perform different functions such as mobilization of savings, risk management and allocation of resources, etc. These functions in turn affect the steady-state growth by affecting capital formation and technological innovation. It also helps in eradicating poverty and removing inequality by providing services that could help the poor to have smooth consumption and manage risks related to financing. Easy and affordable access to financial services makes financial transactions efficient.

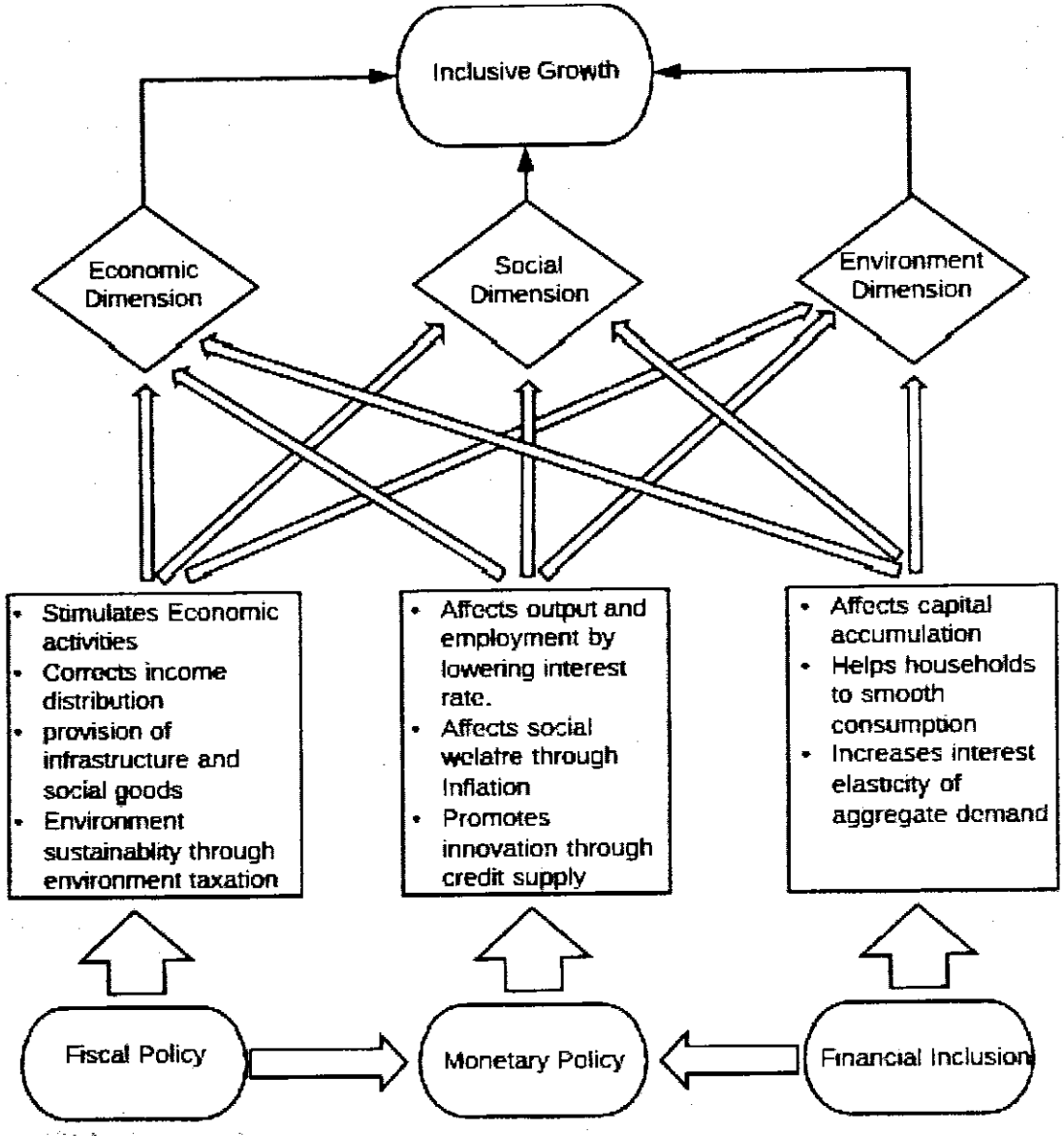
Figure 3.2 explains how the interaction of fiscal and monetary policy along with financial inclusion can lead to an inclusive environment in a country. Fiscal and monetary policy has the potential to affect each of the dimensions of inclusive growth and therefore affects the overall level of inclusiveness in an economy.

Financial inclusion enables deprived people to have access to finance so that they could invest in business and education and health which in turn increases productivity and growth. Financial inclusion making access to finance easy and for everyone can lead the economy towards industrialization that can cause a lower environmental quality due to

increased energy demand and deforestation. On the other hand, financial inclusion's impact on environmental quality may exhibit a positive link because a sound financial structure can introduce energy-efficient technology. Piñeiro et al. (2017) confirm that in the case of developing countries, a sound financial structure by affecting economic growth has a positive impact on environmental quality because an economy with higher incomes can find solutions to combat environmental degradation.

In the light of theoretical efforts throughout history, it is understood that monetary and fiscal policy along with financial inclusion helps to make growth inclusive by creating productive employment opportunities, providing access to social services, and making the environment sustainable. Thus, this study investigates the impact of these policies on the aggregated index of inclusive growth as well as on its dimensions.

Figure 3.2: Effect of Macroeconomic Policies and Financial Inclusion



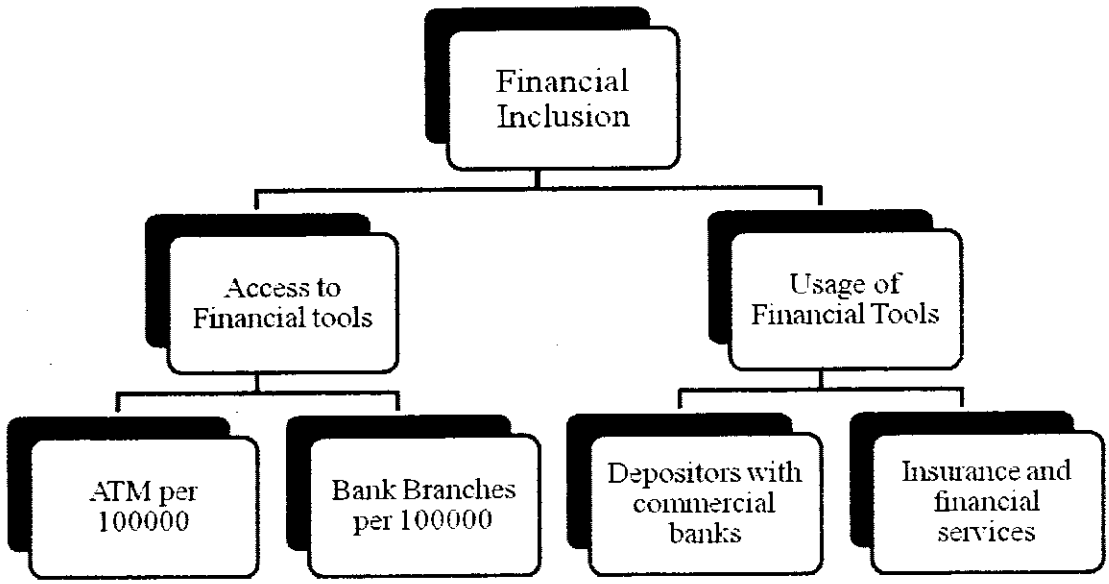
Source: Author's perception

3.4 Measuring Index of Financial Inclusion

In the literature review section, all the methods and dimensions of financial inclusion discussed in past studies have been described. The most frequently used dimensions of financial inclusion are access to financial services and their usage. However, barriers to

access have also been used in studies as a dimension that reflects the demand-side. Due to the data problem, this study considers only the supply-side data. The dimensions and indicators of financial inclusion used in this study are shown in Figure 3.3. The dimensions of IFI are access and usage. The indicators of access include ATMs per 100000 adults and bank branches per 100000 people. The indicators of usage dimension are depositors with commercial banks (per 1,000 adults), borrowers from commercial banks (per 1,000 adults), and insurance and financial services (% of commercial service exports).

Figure 3.3: Dimensions and Indicators of Financial Inclusion



Source: Author's construction

To calculate the demand-side, many researchers used primary data that is questionnaire-based (Cámara and Tuesta, 2014). As this study is not limited to only one country, therefore collection of data based on a questionnaire is a difficult task. In this study,

principal component analysis is used in two stages, once to determine the weights of indicators within a dimension and then to determine the weights to the dimension.

3.5 Methodology to Construct Composite Index

Various approaches are available in the literature that is used for the derivation of a one-dimensional index of inclusive growth. The construction of any composite index involves various steps. The first step is to define the notion that a study wants to measure. In this step, the focus is to define the dimensions of the concept and possible indicators of each dimension. In the previous section, the dimensions of inclusive growth and their indicators have been defined and discussed in detail. The next step is to select the most relevant indicators from the group of possible indicators based on their soundness and accessibility. Generally, these indicators are expected to be correlated with each other but the objective is to select the independent indicators. Salzman (2003) suggests that indicators having fewer correlations must be selected so that redundancy could be reduced. Multiple correspondence analysis, principal component (PCA hereafter), or the correlation analysis are frequently used methods to choose the most relevant indicators and their weights. The studies by McKinely (2010), Cournède et al. (2013), and Mitra and Das (2018) have suggested PCA for the construction of composite inclusive growth index whereas Cámara and Tuesta (2014) used PCA for the construction of an index for financial inclusion.

3.5.1 Principal Component Analysis

Among multivariate statistical methods, PCA, developed by Pearson (1901) is widely used due to the following reasons. Firstly, it is comparatively more intuitive in the sense

that the components are selected based on how much more information they share among the set of interrelated variables (Filmer and Pritchett, 2001). Secondly, the assignment of weights to different components is based on the extent of the information they provide. Thirdly, it is easy to handle as it doesn't involve large computations. Among the indicator, the highly correlated indicators are united as components. If variables show high correlations then there will be a small number of components. Manly (1994) explains that the components should be uncorrelated so that they could measure different dimensions.

The application of PCA to extract appropriate weights for each indicator requires a few pre-requisites. PCA requires a sufficiently large sample size and the rule of thumb is to have a sample size of at least ten times more than the number of items used for the construction of the index. PCA doesn't give any useful information if most of the variables have correlations closer to zero for this we can apply correlation and test the significance of the correlation value that whether it is significantly different from zero or not (Mooi et al., 2018). In short, PCA requires a sufficient level of correlations among indicators. To check this condition, this study uses a pairwise correlation and Bonferroni-adjusted level of significance that helps to avoid the risk of having a type-I error. Its calculation requires a division of level of significance by the number of tests. Mooi et al. (2018) explain that in addition to the correlation test, Kaiser-Meyer-Olkin (KMO) statistics can be used to check sampling adequacy. Its value ranges between 0 and 1. David and Jacobs (2014) explain that KMO tells about whether applying PCA is appropriate or not and suggested that a KMO value greater than 0.5 is considered ideal.

Kiaser (1974) designed the threshold levels for KMO and values are given in the Appendix in Table A1.

Before applying PCA to extract weights, one of the main steps is to normalize the indicators to make them unit less because different indicators are measured in different units. Standardization helps in assessing the communality of each variable. To do so, different techniques, for example, min-max transformation, ranking, z-score, etc. are used. This study uses a min-max transformation to make unit-less variables within the range of zero and a hundred.

Mathematically, if we have a set of n indicator variables that are supposed to be correlated, PCA is used to develop uncorrelated components such that each of the component P_i is a linear combination of the variables X_1, X_2 .....X_n in the set such that maximum variance is extracted from these variables.

$$P_1 = \alpha_{11}\left[\frac{x_1-\overline{x_1}}{s_1}\right] + \alpha_{12}\left[\frac{x_2-\overline{x_2}}{s_2}\right] + \ldots\ldots\ldots\ldots\ldots\ldots + \alpha_{1n}\left[\frac{x_n-\overline{x_n}}{s_n}\right]$$

$$P_2 = \alpha_{21}\left[\frac{x_1-\overline{x_1}}{s_1}\right] + \alpha_{22}\left[\frac{x_2-\overline{x_2}}{s_2}\right] + \ldots\ldots\ldots\ldots\ldots\ldots + \alpha_{2n}\left[\frac{x_n-\overline{x_n}}{s_n}\right]$$

. . . . . .

$$P_k = \alpha_{k1}\left[\frac{x_1-\overline{x_1}}{s_1}\right] + \alpha_{k2}\left[\frac{x_2-\overline{x_2}}{s_2}\right] + \ldots\ldots\ldots\ldots\ldots\ldots + \alpha_{kn}\left[\frac{x_n-\overline{x_n}}{s_n}\right]$$

Where α's are the weights that are assigned to k principal components, and "s" is the standard deviation. Here a constraint is put on the weights that $\alpha\acute{\alpha} = 1$, that is, squared weights must sum to one. The weights for the first component P_1 are chosen such that this

component has the largest variance and P_2 has the second large variance and so on. The weight assigned to each component depends on the eigenvector of the covariance matrix. Let CM is the covariance matrix of the variables X_1, X_2 .....X_n then the eigenvector can be obtained by solving the following equation.

$$|CM - \lambda I| = 0$$

The variance of each of the principal components is calculated by using the Eigen-value of eigenvectors and according to the Kaiser Criterion (Kaiser, 1960), (also known as Latent-root Criterion), we extract all the components having Eigen-value greater than one. After applying PCA, the components give us relative weight for each of the indicators and the next step is aggregation. The most widely used aggregation method is the linear sum of weighted normalized indicators. Nardo et al. (2005) are of the view that the method of linear aggregation assumes that there is no phenomenon of divergence or synergy between indicators and is suitable when indicators are having the same unit of measurement. It has the potential of compensability as compared to geometric aggregation, that is, if some of the indicators have poor performance the effect is compensated by a high performance by other indicators whereas geometric aggregation rewards more value to the index value for the countries having a higher score of indicators. Jollands (2003) explains that for increasing-scale indicators, linear-weighted-sum aggregation is the most suited option.

3.6 The Choice of Econometric Methodology

This study uses panel data that allows assessing the cross-country differences and captures the effects due to changes in independent variables over time. One of the

benefits of using panel data is that we can have more number of observations and thus more degrees of freedom that can lead to reaching any valuable conclusion as mentioned by Raj and Baltagi (2012) that it leads to an efficiency of estimates and provides the researcher a prospect to deal with heterogeneities across time and cross-sections. Furthermore, Hsiao (2014) explains a lot of advantages among them are controlling the effect of omitted variables and the exploration of dynamic relationships. Keeping in view Solow (1956) view about growth, we have included physical capital however instead of labor we have taken human capital. However, trade openness is included because the countries are assumed to be open economies. Kumah and Sandy (2013) highlights the role of institutional quality to have sustainable economy therefore this study includes institutional quality as control variable. One of the objectives of this study is to check whether these macroeconomic policies can affect the dimensions of inclusive growth individually and as well as all at the same time coherently. Thus to assess the impact of fiscal policy and monetary policy on inclusive growth, the following model has been formulated.

$$ECD_{it} = \alpha_1 + \alpha_2 M_{it} + \alpha_3 F_{it} + \alpha_4 M_{it}.\, F_{it} + \alpha_5 Z_{it} + v_i + \omega_t + u_{it} \quad \ldots\ldots (3.1)$$

$$SD_{it} = \beta_1 + \beta_2 M_{it} + \beta_3 F_{it} + \beta_4 M_{it}.\, F_{it} + \beta_5 Z_{it} + v_i + \omega_t + u_{it} \quad \ldots\ldots (3.2)$$

$$EVD_{it} = \gamma_1 + \gamma_2 M_{it} + \gamma_3 F_{it} + \gamma_4 M_{it}.\, F_{it} + \gamma_5 Z_{it} + v_i + \omega_t + u_{it} \quad \ldots\ldots (3.3)$$

$$IGI_{it} = \theta_1 + \theta_2 M_{it} + \theta_3 F_{it} + \theta_4 M_{it}.\, F_{it} + \theta_5 Z_{it} + v_i + \omega_t + u_{it} \quad \ldots\ldots (3.4)$$

Where ECD is the economic dimension of inclusive growth, SD is the social dimension, EVD is an environmental dimension, IGI is the inclusive growth index, M is money supply, F is the fiscal instrument and Z is the vector of control variables. This study also

assesses the effectiveness of macroeconomic policies in the presence of financial inclusion thus the equations including financial inclusion takes the following form

$$ECD_{it} = \pi_1 + \pi_2 M_{it} + \pi_3 F_{it} + \pi_4 Z_{it} + \pi_5 IFI_{it} + \pi_6 IFI_{it} . M_{it} + \pi_7 M_{it} . F_{it} + v_i + \omega_t + u_i \quad ... (3.5)$$

$$SD_{it} = \varphi_1 + \varphi_2 M_{it} + \varphi_3 F_{it} + \varphi_4 Z_{it} + \varphi_5 IFI_{it} + \varphi_6 IFI_{it} . M_{it} + \varphi_7 M_{it} . F_{it} + v_i + \omega_t + u_i \quad ... (3.6)$$

$$EVD_{it} = \sigma_1 + \sigma_2 M_{it} + \sigma_3 F_{it} + \sigma_4 Z_{it} + \sigma_5 IFI_{it} + \sigma_6 IFI_{it} . M_{it} + \sigma_7 M_{it} . F_{it} + v_i + \omega_t + u_i \quad ... (3.7)$$

$$IGI_{it} = \delta_1 + \delta_2 M_{it} + \delta_3 F_{it} + \delta_4 Z_{it} + \delta_5 IFI_{it} + \delta_6 IFI_{it} . M_{it} + \delta_7 M_{it} . F_{it} + v_i + \omega_t + u_i \quad ... (3.8)$$

Where ECD is the economic dimension of inclusive growth, SD is the social dimension, EVD is the environmental dimension, IGI is the index of inclusive growth, M is the monetary policy tool, F is fiscal policy variables, IFI is the index of financial inclusion and Z is the vector of control variables. While u is the error term that is assumed to be independently and identically distributed, that is, $u_{it} \sim iid\ (0, \sigma^2)$. The subscripts *i* is used to indicate country and *t* shows time. v_i and ω_t show the cross country and cross-time effects. All the variables are taken in log form.

Equations (3.1) through (3.3) estimate the effect of macroeconomic policies on the economic dimension, social dimension, and environmental dimension of inclusive growth respectively. Equation 3.4 estimates the impact of fiscal and monetary policy tools on the aggregate index of inclusive growth. The fiscal policy variables are tax to GDP ratio and government expenditure to GDP ratio, whereas the monetary policy variable is the money supply. The control variables are trade openness, human capital, institutional quality, and capital stock. The multiplicative interaction term (M*F) is introduced in the model because fiscal policy affects monetary policy and vice versa.

The effect of monetary policy given fiscal policy thus can be explained as follows

$$\frac{\partial ECD}{\partial M} = \alpha_2 + \alpha_4 F \quad \text{..... (3.9)}$$

$$\frac{\partial SD}{\partial M} = \beta_2 + \beta_4 F \quad \text{..... (3.10)}$$

$$\frac{\partial EVD}{\partial M} = \gamma_2 + \gamma_4 F \quad \text{..... (3.11)}$$

$$\frac{\partial IGI}{\partial M} = \theta_2 + \theta_4 F \quad \text{..... (3.12)}$$

The derivatives given in equations 3.9 through 3.12 show the conditional effect of monetary policy on inclusive growth given fiscal policy. However, the conditional effect of fiscal policy on inclusive growth given the optimal monetary policy is as follows.

$$\frac{\partial ECD}{\partial F} = \alpha_3 + \alpha_4 M \quad \text{..... (3.13)}$$

$$\frac{\partial SD}{\partial F} = \beta_3 + \beta_4 M \quad \text{..... (3.14)}$$

$$\frac{\partial EVD}{\partial F} = \gamma_3 + \gamma_4 M \quad \text{..... (3.15)}$$

$$\frac{\partial IGI}{\partial F} = \theta_3 + \theta_4 M \quad \text{..... (3.16)}$$

The interaction terms in equations 3.5 through 3.8 can be explained as follows

$$\frac{\partial ECD}{\partial M} = \pi_2 + \pi_6 IFI + \pi_7 F \quad \text{..... (3.17)}$$

$$\frac{\partial SD}{\partial M} = \varphi_2 + \varphi_6 IFI + \varphi_7 F \quad \text{..... (3.18)}$$

$$\frac{\partial EVD}{\partial M} = \sigma_2 + \sigma_6 IFI + \sigma_7 F \quad \text{..... (3.19)}$$

$$\frac{\partial IGI}{\partial M} = \delta_2 + \delta_6 IFI + \pi_7 F \quad \text{..... (3.20)}$$

The derivatives given in equations 3.17 through 3.20 show the conditional effects of monetary policy on the economic dimension, social dimension, environmental dimension, and aggregated index of inclusive growth respectively, given various levels of financial inclusion and fiscal policy. The parameters can take on various signs, for example, if both δ_2 and δ_6 in equation 3.8 have the same positive sign then one can interpret it as increase in financial inclusion enhances the positive effect of monetary policy on inclusive growth. If both δ_2 and δ_6 have the same negative sign then it means that financial inclusion enhances the negative effect of monetary policy on inclusive growth. If δ_2 is positive and δ_6 is negative, then financial inclusion decreases the positive effect of monetary policy and if δ_2 is negative and δ_6 is positive, then financial inclusion offsets the negative effect of monetary policy on inclusive growth.

In the literature, numerous estimation techniques have been discussed to handle panel data. While using panel data, if cross-sectional or time-specific effects do not exist then we can get efficient and unbiased estimates of the parameters by applying ordinary –least squares. Although this assumption seems unrealistic this study uses the estimates of Pooled OLS as a reference point. However, if these individual effects (cross-sectional or time) exist then we may encounter the problem of endogeneity, heteroscedasticity, and autocorrelation. To tackle these problems, we have a variant of the panel data model. These estimations include fixed-effect model, random effect model, dynamic fixed-effect model, system GMM, and difference GMM methods.

As our data is a panel of 51 countries (List of countries is given in Appendix Table A2 and selection of sample is subject to the availability of data.) for the period 1995-2017, we have used state-of-the-art panel data estimation methods such as restricted pooled estimation, fixed effects, or random-effects model. These methods incorporate the country-specific effects that may be important while analyzing the panel data of developing countries, where some countries are growing at a faster rate as compared to others. The fixed-effect model with country-specific intercept is used to control unobserved heterogeneity while the heterogeneity is assumed to be constant over time and is correlated with regressors. In a fixed-effect model with a time-specific intercept, it is assumed that heterogeneity is constant over the cross-sections. In the random-effects model, it is assumed that the cross-section or the time-specific effects are not correlated with the explanatory variables. If the assumption of random effects holds, the parameter estimates from the random-effects model will be more efficient than that of the fixed-effects model. To determine whether to use a random effect or the fixed-effect model, the Hausman test is performed in this study.

Initially, this study uses fixed effects and random effects models but to handle the issue of endogeneity and check for robustness FE-IV model has also been used, whereas, to check the validity of instruments, *Hansen's J* test underlying the null hypothesis of "instruments are valid" is used. FE-IV model assumes no autocorrelation and heteroscedasticity, however; the existence of heteroscedasticity and autocorrelation can affect the results.

3.7 Description of Variables

3.7.1 Inclusive Growth Index

In this study, data on inclusive growth is constructed by the researcher by using principal component analysis, and for this purpose; data on dimensions of inclusive growth have been collected. Each of the dimensions has four indicators and the details are as under:

a. Economic Dimension of Inclusive Growth

As one of the objectives of this study is to examine the impact of macroeconomic policies on dimensions of inclusive growth, therefore an index is constructed for each of the dimensions. The economic dimension of inclusive growth is mainly related to economic success at the macro level. To calculate the economic dimension, the indicators used are per capita real income, employment rate, income distribution, and infrastructure, and the details regarding how they are taken as indicators of economic dimension have already been discussed in section 3.2.1.1 of Chapter 3. The per capita real income measures the average income earned by an individual living in the economy. It is calculated by dividing the country's real Gross Domestic Product (GDP) by its population in a specific year. It signals an increase in productivity and also reflects prosperity. Along with other alternative measures, per capita, real GDP has been used as an indicator of the country's living standard by many macroeconomists (Smeeding and Rainwater, 2002; Hobijn and Franses, 2001). Data on per capita real GDP has been obtained from the World Development Indicator (WDI hereafter) published by the World Bank.

The productive employment rate measures how many of the total labor force is employed. The more the individuals are involved in production activities, the more will

be their participation in the growth process and more chances are there for them to reap the fruits of growth. To calculate productive employment, McKinely (2010) proposed many indicators and the share of workers employed in the industry is one of those indicators while others are the share of workers in manufacturing and own-account workers. Due to the unavailability of data for many countries, the only share of laborers in the industry has been used as a proxy that is assumed to partially measure productive employment. This data is retrieved from the International Labor Organization (ILO hereafter) database.

Income distribution is also included as one of the indicators of economic dimension and this study uses the Gini coefficient as a statistical measure of the degree of inequality in the distribution of income. Gini coefficient is calculated based on the Lorenz curve that shows the relationship between the cumulative share of the income earned and the cumulative share of people from the lowest to highest incomes. The value of the coefficient lies between 0 and 1 where 0 shows perfect equality in the distribution of income and 1 shows perfect inequality. The data source of Gini index is the Standardized World Income Inequality Database (SWIID). The fourth indicator of the economic dimension is physical infrastructure. Concerning Mckinley (2010), the indicators of economic infrastructure include access to communication and electricity as these two help in providing the mass access to market information and provide an opportunity to participate in the growth process respectively. Similarly, for access to electricity, WDI's data on people having access to electricity as a percentage of the total population have been used. For communication, data on a mobile cellular subscription per 100 people and fixed telephone subscriptions per 100 people from WDI are used.

b. Social Dimension of Inclusive Growth

The social dimension of inclusive growth reflects the degree of inclusiveness in social terms. The first indicator is education and net school enrollment at the primary and secondary level from WDI is used to measure the extent of individuals who are educated. It is measured as the proportion of children of school age enrolled in schools to the number of children of the corresponding official school-age. To gauge the level of health facilities received by individuals and thus their health position, inverse of infant mortality rate per 1000 has been used. Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year.

To assess the level of social protection provided by the government to the households, data on public social protection expenditures as a percentage of GDP is used which is published by ILO in coordination with ADB and other organizations. To assess the level of equality among males and females in an economy, UNDP calculates the gender inequality index. It measures inequality across gender in the three aspects of human development that is, health (the indicators are maternal mortality ratio and adolescent birth rates), empowerment (the indicators used are the proportion of seats in the parliament occupied by female candidates and the ratio of female to male aged twenty-five years and above with at least secondary education) and economic status (measured as the ratio of female to male aged 15 and above having participation in the labor force). The higher value of the gender inequality index shows more inequality across gender and vice versa.

c. Environmental Dimension

As discussed earlier, the environmental dimension has four indicators that measure the access of people to basic facilities. To measure the first indicator, sanitation, WDI's data on the percentage of the population having access to improved sanitation facilities has been used. The provision of these sanitation facilities helps to prevent human contact from human excreta and the facilities include a flush system, ventilated improved pit latrine, composting toilet, etc. To measure water sources data on the percentage of the population having access to improved drinking water sources released by the World Data Bank is being used. It includes the provision of tap water connections on premises, public taps, tube wells, boring water, protected springs, and rainwater collection.

To measure the third indicator, the forest area as a percentage of the land area is used. It is an indicator that mainly focuses on environmental sustainability. Forest area includes all types of terrain that have tree stands (either natural or planted) of at least 5 meters in situ. It doesn't matter whether these tree stands are productive or not but these do not include tree stands in agricultural production systems. The last indicator in this category is the consumption of fossil-fuel energy. To measure this indicator, WDI's data on the consumption of fossil-fuel energy as a percentage of total energy use has been used. Consumption of fossil-fuel energy includes the consumption of coal, petroleum, oil, and natural gas products.

3.7.2 Index of Financial Inclusion

This study also attempts to calculate an index of financial inclusion using PCA to measure how many individuals have easy and affordable access to useful financial

services so that they could meet financial needs. The two dimensions of financial inclusion are access and usage and the details are as follows

a. Access to Financial Services

To calculate the access to financial services, data on its indicators are collected from the World Bank. The first indicator is ATMs per 100000 adults that provide the facility to the individuals to have access to their bank accounts and can withdraw their money beyond banking hours. It also provides the facility to make financial transactions at any time in public places where the ATM facility is available. The second indicator is bank branches per 100000 people. This includes all the branches of commercial banks located in residential or commercial areas that offer financial services to people. These branches are physically estranged from the main office but provide almost all the services that are offered by the main branch.

b. Usage of Financial Services

There are two indicators under this dimension. The first indicator is depositors with commercial banks (per 1000 adults) and data on this indicator is collected from the World Bank. This indicator gives you an idea about the number of adults who are reported to hold a deposit account with commercial banks. The types of deposits held by these individuals are saving accounts, checking accounts, and time deposits. The second indicator is insurance and financial services (as a percentage of commercial service exports) and data on this indicator is also collected from World Data Bank. It covers life insurance, financial intermediation services, and auxiliary services which include

operational and regulatory services by the financial market. It also includes freight insurance on exported goods.

3.7.3 Fiscal Policy Variables

Many researchers have provided a long debate on the effectiveness of fiscal policy in ensuring inclusive growth. The fiscal tools that are used in this study for analysis are tax revenue and government expenditures both as a percentage of GDP. Tax revenue includes all the compulsory payments transferred to the government by households, enterprises, organizations, etc. to fulfill public needs. It includes all the revenues that are collected from direct taxes such as income tax, profit tax, property tax, etc., and indirect taxes such as sales tax, customs duty tax, excise duty tax, etc. Fines and penalties are not included in this heading. Tax revenue as a percent of GDP shows the share of tax revenue in the country's total output. A progressive income tax is supposed to have a positive effect on income distribution while if it is quite high then the Laffer curve (Wanniski, 1978) suggests that it may cause tax revenues to reduce because it affects the incentive to work. This in turn can slow down the growth as well.

For government expenditures, data on general government final consumption expenditure (% of GDP) has been collected from the World Bank. It constitutes a big proportion of the GDP and includes all the spending made for the purchase of goods and services, security, and national defense but not the military expenditures. It indicates the size of the government. Luo et al. (2017) conduct panel data estimation using OECD data and conclude that government size is negatively related to capital income inequality, whereas Anderson et al. (2017) find a moderate positive association between government

spending and inequality. Ghali (1999) provides empirical evidence using panel data on OECD countries that there exists a relationship between the size of the government and economic growth.

3.7.4 Money Supply

To capture the impact of money supply on inclusive growth, the World Bank's data on broad money as a percentage of GDP is used as the indicator of the money supply. Broad money (M2) is the sum of all forms of money in circulation, demand deposits, time deposits, securities, bank and traveler's checks, and foreign currency deposits.

3.7.5 Control Variables

Without capital and labor, any kind of growth, whether inclusive or not, is not possible that is why this study takes in labor and capital as control variables. But labor force is not taken as a control variable because the calculation of the dependent variable includes labor share in the industry. For capital stock, gross fixed capital formation as a percentage of GDP is taken. As almost all of the developing countries are indulged in the trade of goods and services, this study attempts to analyze the impact of trade openness on inclusive growth. Trade openness is calculated as the sum of imports and exports of goods and services divided by GDP. Since the 1980s, human capital has been considered an important determinant of economic growth in the literature of growth (Mincer, 1984) thus its effect on inclusive growth is also analyzed through this study. Data on the human capital index based on years of schooling and returns to education is obtained from FRED. Institutional quality is also assumed to have a significant impact on inclusive growth because inclusive institutions will ensure inclusive growth. Carter (2015) defines

inclusive institutions as institutions that focus on providing equal opportunities and eliminates discrimination and target actions. Kumah and Sandy (2013) also suggest that for sustainable growth with equal benefits to all, good quality of economic institutions matter. Data on institutional quality is gathered from the International country risk guide (ICRG hereafter).

While dealing with numerous countries and indicators to construct indices, we encountered the problem of missing values. For some countries, some data points on bank branches, social security, gender inequality, ATM, and bank depositors were missing. Huh and Park (2019) state that missing data affects the reliability of the composite index. The issue of missing data has been handled in different ways in the literature. Gwartney and Lawson (2009), while making an index for world economic freedom, use an autoregressive backcasting approach to fill previous values based on currently available values, whereas Gwatkin et al. (2007) used average values to replace the missing values of a variable. On the other hand, while making the CSGR globalization index, Lockwood and Redoano (2005) handled in between missing values by the method of linear interpolation. Stotsky et al. (2016) also utilized the linear interpolation method to tackle missing values in wage data and maternal mortality rate given the availability of at least five-years data whereas for variables having almost complete data set but values are missing for recent years most recently available data is used to fill in the missing data points. Gygli et al. (2019) also treat within a series missing values using linear interpolation whereas for data missing at the start and end by carrying non-missing observations backward and forward respectively. The robustness of the modeling choice of the global innovation index constructed by Dutta et al. (2019) has

been checked by the JRC-COIN audit by filling in the missing values using geometric averages and random weights.

To handle the problem of missing data, this study takes different measures. The first measure is to exclude the countries for which over the required period, less than 25 percent of data is available (Lin et al., 2019). This leaves us with only 51 developing countries. To impute data, missing values of the variables showing linear trend have been predicted using a linear interpolation method and this treatment has been done for social protection expenditures and gender inequality index. For school enrollment and bank branches, following the study of Gygli et al. (2019) backward fill-in method whereas for data of ATM and bank depositors are found to have geometric progression calculated by dividing available current value by previous value.

CHAPTER 4

CONSTRUCTION OF INDICES

This chapter discusses in detail the results of methods and techniques applied in this study to construct an index of economic, social, and environmental dimensions, aggregated index of inclusive growth, and financial inclusion. This section illustrates the summary of descriptive statistics of the indicators, the extent of correlations among indicators, and the results of Principal Component Analysis (PCA) in detail.

4.1 Construction of the Index of Economic Dimension

As discussed in Chapter 3, indicators of this dimension are the growth of per capita real GDP, Gini index, productive employment, and economic infrastructure. An index of economic infrastructure has been obtained by applying PCA on the mobile phone and fixed telephone subscriptions per 100 people and the proportion of people having access to electricity. The summary statistics of the variables used in the construction of the economic dimension index are given in Table 4.1.1.

Table 4.1.1 shows that the average usage of electricity in the developing regions of the world from 1995 to 2017 is 73.874, though, the maximum value is 100 which shows that in some countries all of the people have access to electricity. On the other hand, the value is still very low where less than half of the population has access to electricity, for example, the latest figure for the Congo Democratic Republic is 19.1, 27.4 for Mozambique, and 40.3 for Zambia. The average subscription to fixed telephone per 100 people is only 10.411 because, after the launch of the mobile phone in 1973 and the launch of a commercial cellular network in 1991, people started using mobiles as a means

of communication. In countries like Ethiopia and Haiti, use of mobile till 1996 was zero. On the other hand, due to its ease, the consumption of mobile phones has increased and the average user per 100 people in developing countries is around 51 percent. Throughout 1995-2017, the minimum value of the Gini index is 27 and the highest value is 62.3 which shows that the high-income group holds 62.3 percent of total income while the average value of the Gini index over the covered period is 43.84. The value of average per capita income is 8623 whereas the minimum value of per capita real GDP in the region has been $373 per person throughout 1995-2017 while 2017's figure for Zimbabwe and Haiti has been relatively low that is 1411 and 1427 respectively. In developing regions, the average share of workers in the industry is only 19.66 whereas the maximum workers share in the industry has 47.6.

Table 4.1.1: Descriptive Statistics of the Indicators of Economic Dimension

Variable	Mean	Std.Dev.	Min	Max
Electricity	73.874	28.311	1.119	100
Telephone	10.411	11.144	0	60.461
Mobile	50.777	47.899	0	182.43
Gini index	43.842	6.846	27	62.3
Per capita GDP	8623.071	6499.264	373.435	35938.4
Labor share in industry	19.666	7.506	2.485	47.595

Before applying PCA on indicators, it is important to note that this study has taken the inverse of the Gini index because an increase in the Gini index corresponds to higher inequality that affects the inclusiveness of growth negatively. All the variables are

normalized using the max-min approach, thus, values of each indicator are ensured to be between 0 and 100. Since PCA assumes a sufficient level of correlation among indicators pairwise correlation and Bonferroni-adjusted level of a significance test are used. The results are given in Table 4.1.2. Results indicate that the p-value for all the correlations is below 0.05 thus we can say that variables are positively and sufficiently correlated at a 5 percent level of significance. The next step is to apply PCA and the Eigenvalues and factor loadings are given in Table 4.1.3 and Table 4.1.4 respectively.

Table 4.1.2: Pair-Wise Correlation Coefficients

	Employment	**Infrastructure**	**Per capita GDP**	**Gini**
Employment	1.0000			
Infrastructure	0.5748 (0.0000)	1.0000		
Per capita GDP	0.5046 (0.0000)	0.7778 (0.0000)	1.0000	
Gini	0.1705 (0.0000)	0.2027 (0.0000)	0.1504 (0.0000)	1.0000

Table 4.1.3: Eigen Values of the Components

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
Comp1	2.315	1.383	0.579	0.579
Comp2	0.933	0.396	0.233	0.812
Comp3	0.537	0.322	0.134	0.946
Comp4	0.215	.	0.054	1.000

Table 4.1.4: Factor Loadings of Each Component

Variable	Comp1	Comp2	Comp3	Comp4
Employment	0.511	-0.083	0.848	0.115
Infrastructure	0.598	-0.119	-0.272	-0.745
Per capita GDP	0.575	-0.182	-0.453	0.656
Gini **KMO: 0.6787**	0.224	0.973	-0.046	0.042

The Eigenvalue of the only first component in Table 4.1.3 is greater than one, therefore, factor loadings of the first component is used to construct an index of economic dimension and the value of proportion shows that the first component explains around 58 percent variation. The KMO statistic is 0.6787 which is above 0.5 and indicates sampling adequacy. For aggregation, a linear sum of weighted normalized indicators is used.

4.2 Construction of the Index of Social Dimension

To construct the index of the social dimension of inclusive growth, the indicators are education, health, social protection, and gender equality. Since the gender inequality index has its value is between 0 and 1, where 0 indicates no loss to human development due to gender inequality while 1 shows a complete loss, a higher value affects the social dimension negatively therefore its inverse is taken as a proxy for gender equality. The summary statistics of the variables used in the construction of the social dimension index are given in Table 4.2.1. Statistcal summary show that the average of net school enrollment at the primary and secondary level is covered developing region is 67.92 percent while the average of inverse of mortality rate per 1000 live births from 1995 to

2017 is 67.322 reaching the maximum of 82.55 in Isreal in 2017 which is quite high. The higher the value of inverse mortality rate, better will be the health condition. The average public social protection expenditure in developing regions over the discussed period is only 6.378 whereas the maximum value is around 30 percent. The average value of gender equality is 0.492 although the minimum value is 0.052 which is pretty low.

Table 4.2.1: Descriptive Statistics of the Indicators of Social Dimension

Variable	Mean	Std. Dev.	Min	Max
Education	67.92	23.448	0.000	99.99
Health	67.322	8.764	43.125	82.556
Social Protection	6.378	4.278	0.100	22.933
Gender equality	0.492	0.136	0.052	0.79

Before PCA, preliminary correlation analysis is done and the results are reported in Table 4.2.2. All the probability values are less than 0.05 showing the existence of a sufficient level of correlation among variables.

Table 4.2.2: Pair-Wise Correlation Coefficients

	Education	Health	Social Protection	Gender Equality
Education	1.0000			
Health	0.7519 (0.0000)	1.0000		
Social Protection	0.5509 (0.0000)	0.4700 (0.0000)	1.0000	
Gender Equality	0.6183 (0.0000)	0.6061 (0.0000)	0.5167 (0.0000)	1.0000

PCA is run on normalized indicators and the results of Eigenvalues and factor loadings are reported in Table 4.2.3 and Table 4.3.3 respectively.

Table 4.2.3: Eigen Values of the Components

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.766	2.196	0.692	0.692
Comp2	0.570	0.146	0.142	0.834
Comp3	0.424	0.184	0.106	0.940
Comp4	0.240	.	0.060	1.000

Table 4.2.4: Factor Loadings of Each Component

Variable	Comp1	Comp2	Comp3	Comp4
Education	0.534	-0.240	-0.337	-0.737
Health	0.517	-0.454	-0.301	0.660
Social Protection	0.449	0.857	-0.209	0.142
Gender Equality	0.496	-0.044	0.867	-0.023
KMO: 0.7844				

Based on the Kaiser Criterion, the first component has been selected because its Eigenvalue is greater than 1 and it is accounted for by explaining 69.2 percent variations. According to Kaiser Criterion, an Eigenvalue of greater than 1 shows that the component explains the variability of more than one variable's worth. The value of KMO is 0.7844 which shows sample adequacy. The components give us relative weight for each of the indicators and the linear sum of weighted normalized indicators is used for aggregation.

4.3 Construction of the Index of Environmental Dimension

The indicators that measure the environmental dimension of inclusive growth are forest area, consumption of fossil fuel energy, access to safe drinking water, and sanitation. Except for fossil-fuel energy consumption, increasing values of all the indicators contributes positively towards the improvement of the environment therefore inverse of fossil-fuel energy consumption is taken in this study. The summary of the descriptive statistics of the indicators is given in Table 4.3.1. The descriptive statistics show that the average forest area in the developing region from 1995 to 2017 is 346000 conversely the minimum value is 515. The consumption of fossil fuel energy in the developing world has reached 100 percent whereas the average consumption has been 61.426 percent. It is a good indicator that in developing region the maximum value of access to water and sanitation is 100 percent but the average values of access to water and sanitation are 80.552 and 62.21 due to the reason that people in some of the developing countries, for example, Peru, Senegal, and Venezuela do not have access to drinking water and sanitation facilities.

Table 4.3.1: Descriptive Statistics of the Indicators of Environment Dimension

Variable	Mean	Std.Dev	Min	Max
Forest Area	346000	773000	515	5300000
Fossil-fuel Consumption	61.426	28.012	.293	100
Access to Water	80.552	18.872	9.13	100
Access to Sanitation	62.21	28.758	1.781	100

Whereas the preliminary analysis of pairwise correlations and Bonferroni level of significance are given in Table 4.3.2. The probability values of correlations between fossil-fuel consumption and access to water are less than 0.05. Correlation between forest area and fossil fuel consumption is significant at 10 percent level of significance. The probability value suggests no correlation between access to sanitation and forest area and forest area and access to water. Mooi et al. (2018) state PCA gives reliable information if most of the correlations are significant. The Eigenvalues and factor loadings are given in Table 4.3.3 and Table 4.3.4 respectively.

Table 4.3.2: Pair-Wise Correlation Coefficients

	Forest Area	**Fossil-Fuel Consumption**	**Access to Water**	**Access to Sanitation**
Forest Area	1.0000			
Fossil-Fuel consumption	-0.0750 (0.0610)	1.0000		
Access to Water	-0.1701 (1.0000)	0.7579 (0.0000)	1.0000	
Access to Sanitation	-0.2052 (1.0000)	0.7020 (0.0000)	0.8149 (0.0000)	1.0000

Table 4.3.3: Eigen Values of the Components

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
Comp1	2.520	1.520	0.630	0.630
Comp2	1.000	0.696	0.250	0.880
Comp3	0.304	0.128	0.076	0.956
Comp4	0.176	.	0.044	1.000

The Eigenvalue of the first component is greater than 1, whereas the Eigenvalue of the second component is exactly one, this study considers the first component only. The factor loading of the first component given in Table (4.2.4) is used as weights and then the indicators are multiplied by their respective weights. The linear sum of the weighted normalized indicator is used as an index of the environmental dimension.

Table 4.3.4: Factor Loadings of Each Component.

Variable	Comp1	Comp2	Comp3	Comp4
Forest Area	-0.044	0.997	0.060	0.022
Fossil fuel Consumption	0.563	-0.028	0.795	0.226
Access to water	0.590	0.055	-0.194	-0.782
Access to sanitation **KMO: 0.7323**	0.577	0.047	-0.572	0.581

The KMO statistic is 0.7323 which indicates that our data is well suited for principal component analysis. Using relative weight for each of the indicators and the next step is aggregation and the linear sum of weighted normalized indicators is used for aggregation.

4.4 Construction of the Index of Inclusive Growth

Since the core concern of this study is to measure inclusive growth, extreme care has been taken while choosing the dimensions and indicators. The three dimensions of inclusive growth are calculated using PCA now the second stage PCA is applied to these dimensions to find the combined index. A pair-wise correlation test is applied to the dimensions to examine the existence of a sufficient level of correlation. The result of the

correlation test is given in Table 4.4.1. The probability values for all the correlations are less than 0.05 leading to the proof that dimensions are sufficiently correlated.

Table 4.4.1: Pair-Wise Correlation Coefficients

	Economic Dimension	Social Dimension	Environmental Dimension
Economic Dimension	1.0000		
Social Dimension	0.8989 (0.0000)	1.0000	
Environmental Dimension	0.9022 (0.0000)	0.8348 (0.0000)	1.0000

PCA is applied to these dimensions and the Eigenvalues and factor loadings of the components are given in Table 4.4.2 and Table 4.4.3 respectively.

Table 4.4.2: Eigen Values of the Components

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.758	2.592	0.919	0.919
Comp2	0.165	0.088	0.055	0.974
Comp3	0.077	.	0.026	1.000

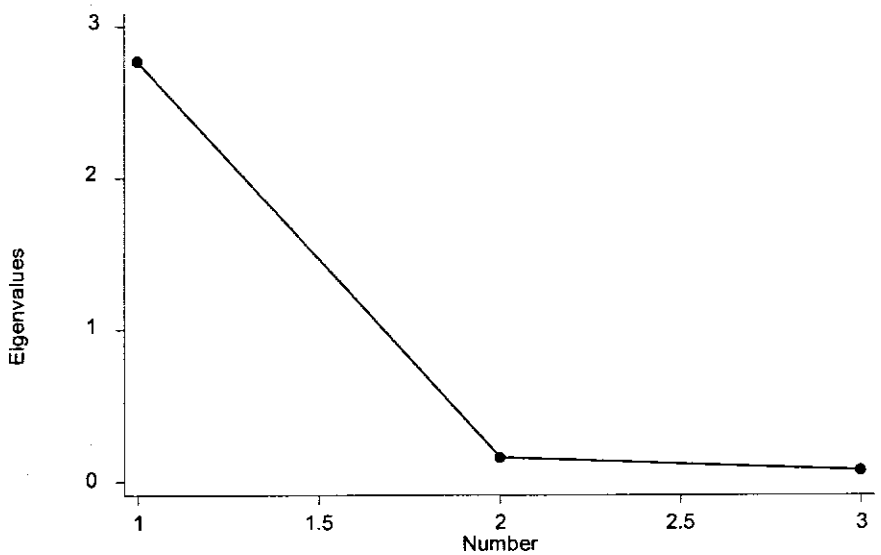
The Eigenvalue of the first component is 2.758 and it explains 91.9 percent variation, thus following the Kaiser criterion, the first component is used to construct the index of inclusive growth. The KMO statistic of value 0.7469 shows the suitability of data for PCA.

Table 4.4.3: Factor Loadings of Each Component.

Variable	Comp1	Comp2	Comp3
Economic Dimension	0.587	-0.017	-0.810
Environmental Dimension	0.572	0.716	0.400
Social Dimension **KMO: 0.7469**	0.573	-0.698	0.430

The scree plot is given in Figure 4.4.1 also confirms that we should retain only the first component.

Figure 4.4.1: Scree plot of Eigenvalues after PCA



Thus, to construct an index of inclusive growth, the factor loadings of the first component are used to find the weighted sum of the three dimensions.

4.5 Construction of the Index of Financial Inclusion.

One of the objectives of this study is to determine the impact of macroeconomic policies on inclusive growth provided that a sound financial structure that is inclusive as well is available and to examine this situation, we must have data on financial inclusion. To create an index for financial inclusion, this study considers two dimensions, namely access to financial tools and usage. These two dimensions have further two indicators.

A statistical summary of these indicators is reported in Table 4.5.1. Table 4.5.1 shows that the average of bank branches per 100,000 people in the developing region from 1995 to 2017 is 10.473. The maximum value for commercial bank branches 100,000 over the period is 78.691 while the latest figures for the Congo Democratic Republic and Cameroon are 1.0 and 2.2 respectively. Statistics of insurance and financial services demonstrate that the average is 3.993 in the developing region. Surprisingly for some of the developing countries including Zambia, Ethiopia, Jamaica, and Israel, the current figure is zero.

Data on ATM facilities per 100,000 individuals show an average of 24.481 whereas the minimum value during the period is zero while countries like Ethiopia and the Congo Democratic Republic presenting the latest figures of 0.46 and 1.31 respectively. Depositors with commercial banks per 1,000 individuals in developing region from 1995 to 2017 shows an average of 591.654 reaching to the maximum of 5383.73 while the latest figure is 29.1 for China.

Table 4.5.1: Descriptive Statistics of the Indicators of Financial Inclusion

Variable	Mean	Std. Dev	Min	Max
Bank Branches	10.473	9.15	0.046	78.691
Insurance and Financial Services	3.993	5.295	0	65
ATM	24.481	38.659	0	313.065
Depositors with Banks	591.654	693.819	0.003	5383.73

To find the aggregated index; PCA is applied in two stages. In the first stage, PCA is used to construct the index value for dimensions of financial inclusion whereas, in the second stage, PCA is applied to find weights of the dimensions, and then the linear aggregation method is used to construct the index of inclusive finance. Before the application of PCA, all the indicators were normalized using the max-min approach. This leaves the values of each indicator to be in the range of 0 and 1. The results of the PCA are reported in Table 4.5.2. The Eigenvalues of the first component have been detailed in Table 4.5.2 and it indicates that all are greater than 1. The KMO statistics for all of the three PCAs are 0.500 which is acceptable. The first component accounts for 69 percent variation in case of access to financial services and 52.36 percent in case of usage of financial services whereas the first component accounts for 82.29 percent variation. Thus, to construct an index, the factor loadings of the first component are used to find the weighted sum of the dimensions.

Table 4.5.2: Results of PCA

Variable	Factor Loadings	Eigen Value	Percentage of Variations	KMO Statistics
Access to Financial Services		1.3846	0.6923	0.5000
a) ATM Facility	0.7071			
b) Bank Branches	0.7071			
Usage of Financial Services		1.0472	0.5236	0.5000
a) Depositors with Banks	0.7071			
b) Insurance and Financial Services	0.7071			
Index of Financial Inclusion		1.6458	0.8229	0.5000
Access	0.7071			
Usage	0.7071			

CHAPTER 5

GRAPHICAL ANALYSIS AND DESCRIPTIVE STATISTICS

This chapter presents a graphical analysis and statistical summary of dependent and independent variables. There are two sections in this chapter; the first section presents scatter plots that show the relationship between two sets of data and in the second section, descriptive statistics are given that describe basic features of the data in the study.

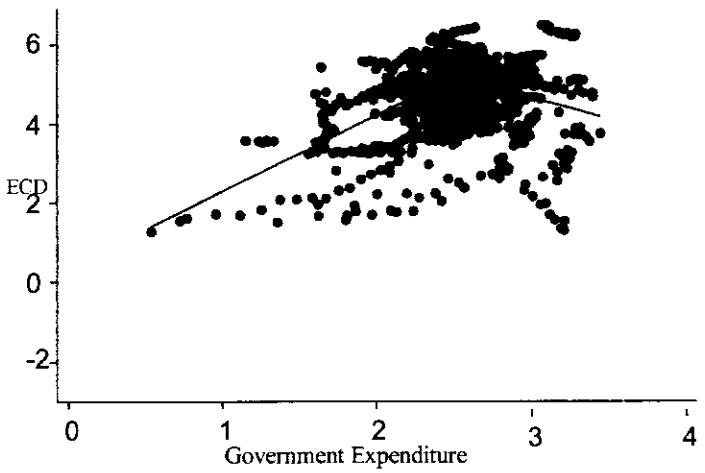
5.1 Scatter Plots

As a part of the preliminary analysis, scatter plots of dependent and independent variables have been plotted using locally-weighted smoothing to see the possible relationships between them. All the variables are taken in log form. To analyze the relationship between fiscal tools and the economic dimension of inclusive growth, a scatter plot of economic dimension and government expenditures is given in Figure 5.1. It shows that inclusiveness of the economy increases at initial levels of government expenditure whereas at higher levels it shows a negative relationship. Chu and Hemming (1991) explain that the composition of expenditure matters and productive expenditures are always growth-inducing. Rubinson (1977) and Ram (1986) found that, in the case of low-income countries, increasing government size stimulates growth.

Whereas Barro (1990), Landau (1983), and Romer (1990) found that a large share of government consumption affects the growth rate of per-capita output negatively but the relationship is positive for developing countries. An interesting finding was stated by Karras (1996) that examines that the optimal size of the government is 23 percent of GDP but it ranges between 14 and 33 percent and also marked the level of provision of

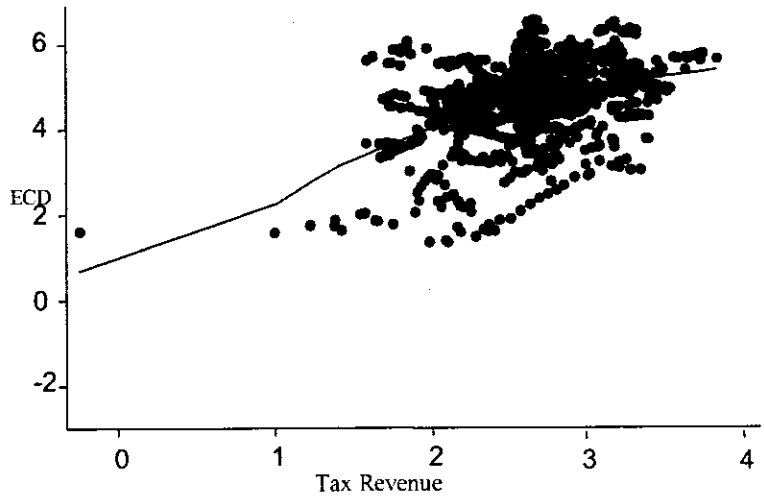
government services in Asia as underprovided, in Africa as over provided and at optimal level elsewhere. Thus, countries having large shares of government spending in GDP than the optimal size are found to have less output and employment because it causes an increase in debt burden and through interest rate crowds out the private investment.

Figure 5.1: Economic Dimension and Government Expenditures



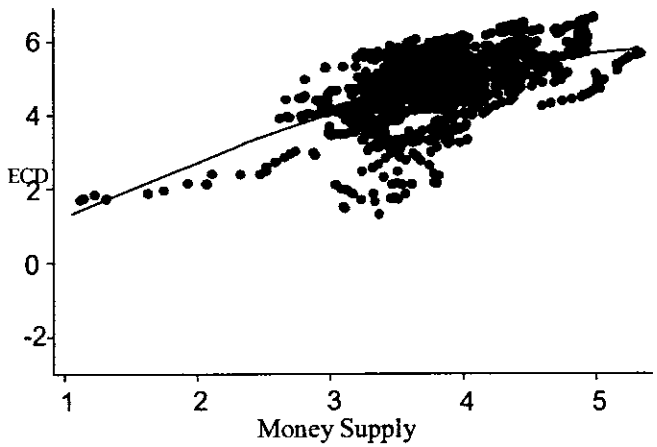
The second tool of fiscal policy taxes, and to show how the collection of tax revenue affects economic dimension, a scatter plot of economic dimension and tax revenue is given in Figure 5.2. The scatter plot shows a positive relationship between economic inclusiveness and tax revenue and is in line with the study of Ofoegbu et al. (2016) that shows a positive and significant effect of tax revenue on economic development. As Ola (2001) and Musgrave and Musgrave (1973) put in plain words that taxation mainly aims to resource mobilization and distribution of wealth, thus it affects income distribution, output, price, and employment level.

Figure 5.2: Economic Dimension and Tax Revenue



Along with the fiscal policy, monetary policy also affects the economic dimension of inclusive growth while to assess the relationship between the economic dimension and money supply in this study, the scatter diagram is plotted and is given in Figure 5.3. It shows a positive link between economic inclusiveness and Money supply that supports the Monetarists' view. Some studies stress the fact that economic activities require a suitable level of supply of money in the economy (Friedman and Meiselman, 1963; Hanke, 1997) whereas Ikhide and Alawode (2001) advise that a reduction in money supply causes an increase in the interest rate that in turn affects economic growth and employment negatively. Ogunmuyiwa and Ekone (2010) stress the fact that one of the reasons for the low level of growth and development in African countries is the low supply of money stock. Thus, the money supply puts a positive impact on economic indicators.

Figure 5.3: Economic Dimension and Money Supply



Financial inclusion refers to easy access to finance and its frequent usage that is expected to help individuals to protect themselves against the worse effects of economic crises thus it affects economic dimension, to assess the relationship between the economic dimension and financial inclusion, a scatter plot is given in Figure 5.4. The scatter plot shows a positive association between economic dimension and financial inclusion. Raza et al. (2019) and Tu et al. (2019) empirically investigate the impact of financial inclusion and found that it helps to promote economic development. Financial inclusion increases the sphere of the economic system by providing opportunities for many individuals to start their businesses and increases economic growth as well.

The Social dimension of inclusive growth focuses on a process that improves the ability, opportunity, and dignity of socially disadvantaged people. However to assess the association between social dimension and macroeconomic policies and financial inclusion in this study, scatter diagrams are plotted. The relationship between government expenditure and social inclusion is graphically explained in Figure 5.5. According to the

scatter plot, the link is not positive or negative. The initial levels of government expenditures correspond to higher social inclusion and vice versa. Meheus and McIntyre (2017) explain that increase in government expenditures do not lead to social welfare if revenue is backed by regressive sources and also discuss the role of fiscal space in providing social services because a low fiscal space is a threat to financial sustainability and limits the government from spending a larger proportion of state's expenditure on education, health, and other social services.

The composition of government expenditure is a big aspect that should be considered while analyzing the impact of government size and social well-being. Verhoeven et al. (1999) providing empirical evidence conclude that government expenditures play an insufficient role in the attainment of health and education.

Figure 5.4: Economic Dimension and Financial Inclusion

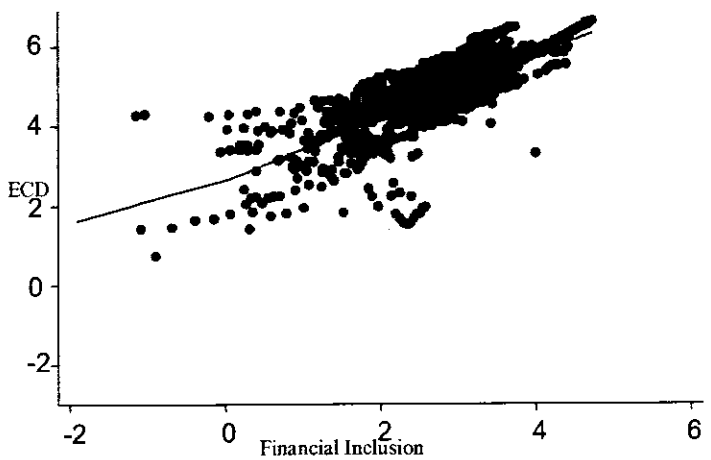
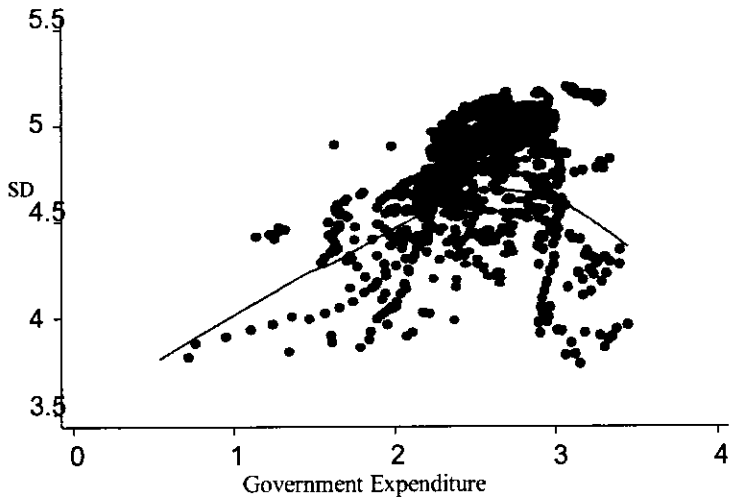


Figure 5.5: Social Dimension and Government Expenditure



Taxes also affect social inclusion because through resource mobilization it helps to provide social goods and services. It is believed that the main purpose of tax collection by the government is to endow the economy with services, for example, infrastructure, an adequate system of education and health, etc., that do not yield revenue directly but affects the economic wellbeing in the long run (Worlu and Nkoro, 2012). Thus, tax revenues result in increased social inclusion. A Scatter plot of tax revenues and social dimensions is given in Figure 5.6 that depicts a positive relationship between tax revenues and social dimensions.

Monetary policy also through its price and credit channel affects social welfare. Many studies have shown the fact that monetary policy, through its interaction with fiscal and labor market policy and by influencing price stability, affects the overall welfare gain (Ravenna and Walsh, 2009 and Faia, 2008). Figure 5.7 illustrates the relationship between the money supply and social inclusion. The scatter plot shows that an increase in the supply of money affects social inclusiveness positively. Monetary policy can transmit

its effect through three mechanisms, that is, interest rate, prices, and credit expansion, and thus affects the economic and social opportunities. Ihsan and Anjum (2013) while analyzing the impact of money supply conclude that a sound monetary policy devised by the central bank can ensure an inclusive health and education system and attracts FDI and can maintain desirable foreign currency exchange rates.

Figure 5.6: Social Dimension and Tax Revenue

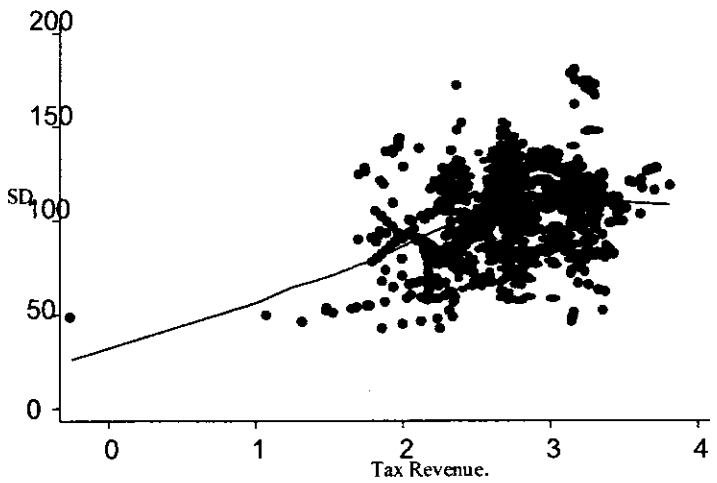
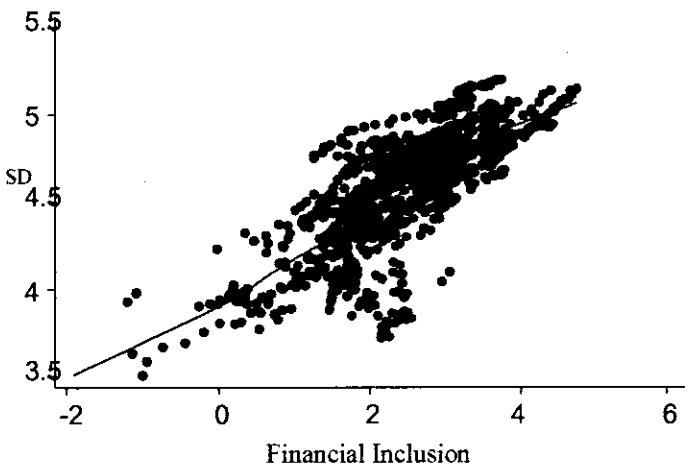


Figure 5.7: Social Dimension and Money Supply

To assess the relationship between the social dimension and financial inclusion in this study, a scatter plot between the two is given in Figure 5.8. The scatter plot shows that a higher level of financial inclusiveness results in high levels of social inclusion. This is because easy access to finance helps the neglected class to shield themselves from social disparities and the availability of credit on easy terms makes them trouble-free to invest in education and health. It also helps to decrease the gender disparity because poor families neglect girls' education due to a shortage of income.

Figure 5.8: Social Dimension and Financial Inclusion

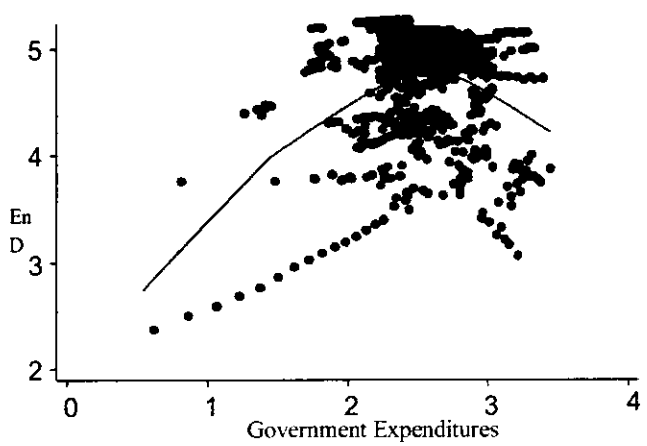


The availability of funds for all on easy terms also encourages females to start their business thus improves their both economic and social conditions. Deka (2015) while analyzing financial inclusion and women empowerment stresses the fact that financial inclusion helps women to achieve wellbeing by satisfying their practical needs.

The third dimension of inclusive growth is the environment dimension and to observe the relationship between the environment dimension and macroeconomic policies and financial inclusion, scatter diagrams have been plotted. Figure 5.9 depicts the scatter plot

of the environment dimension and government expenditure. The graph does not explain a clear positive or negative relationship while it can be concluded that at low levels of government expenditures, environmental inclusiveness improves while at a higher level the environmental dimension of inclusive growth shows a decline. This is following the environmental Kuznets curve that shows that initially, an increase in government expenditures causes provision of basic human needs, that is, water and sanitation but with higher expenditures through increased economic activities increases the need for energy and pollutes the air because developing countries cannot abruptly jump to advance techniques of energy efficiency and unwilling depends on fossil-fuel energy consumptions. On the other hand, increased economic activities also reduce the forest area and hurt the green economy.

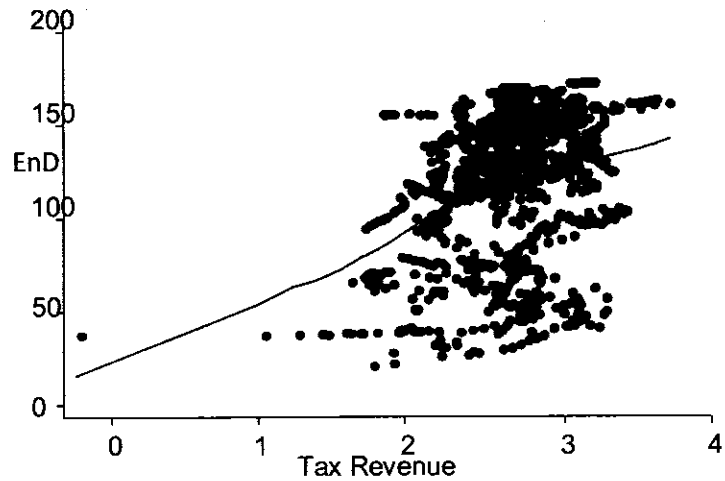
Figure 5.9: Environment Dimension and Government Expenditures



To assess the impact of tax revenue on the environment dimension, Figure 5.10 shows a scatter plot of the environment dimension and tax revenues. The scatter plot between environment dimension and tax revenues depicts a positive link between them. It implies

that an increase in tax revenue is being utilized to provide individuals with basic human needs.

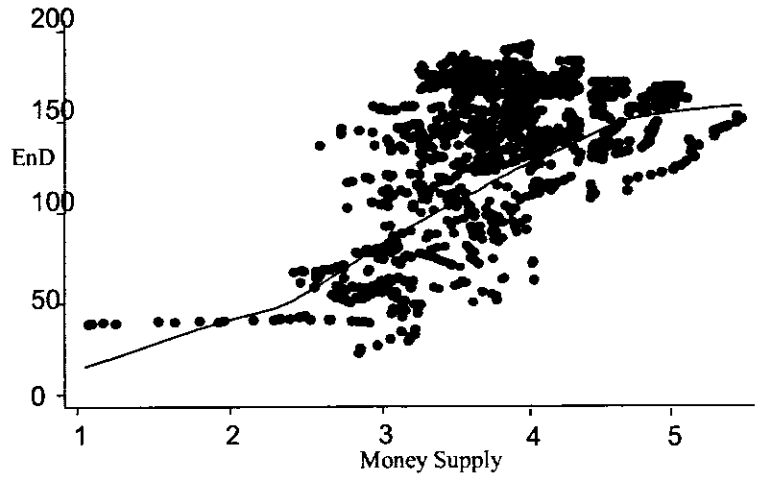
Figure 5.10: Environment Dimension and Tax Revenues



The tax revenue also includes the environmental tax and Juergensmeyer (1967) suggests that taxation on water pollution brings a positive change to the environment if the revenue generated through taxation is used for the purification of polluted water. Similarly, following the Pigouvian tax rule, taxes restrict the industries to use materials that are hazardous to the environment and force them to use environment-friendly production techniques.

Along with the fiscal policy, monetary policy also affects the environmental dimension of inclusive growth. An increase in the money supply by affecting the interest rate reduces the cost of production and encourages investors to use environment-friendly methods of production. Figure 5.11 illustrates the scatter plot of the environment dimension and money supply. The graph shows a positive relationship between money supply and environment inclusiveness.

Figure 5.11: Environment Dimension and Money Supply



Many studies have shown a positive link between environmental quality and financial development. To see the link between financial inclusion and environment dimension, Figure 5.12 shows the scatter plot of the environment dimension and financial inclusion. The scatter plot shows that there is a positive relationship between environmental inclusiveness and financial inclusion. A well-established financial structure attracts FDI and encourages research and development (R&D) activities that lead to an improvement in environmental quality. (Frankel and Romer, 1999). On the other hand, Tamazian and Rao (2010) are of the view that in the presence of better institutional quality, easy access to finance helps to bring a decline in environmental degradation.

The scatter plots given in Figure 5.1 to 5.12 show how macroeconomic policies and financial inclusion are associated with dimensions of inclusive growth, however, to assess the impact of fiscal policy on the overall index of inclusive growth, Figure 5.13 represents the relationship between the inclusive growth index and government expenditures. The graph shows that initially when government expenditures increase, it

increases the level of inclusiveness but after a certain point an increase in government expenditures causes inclusive growth to decline. Developing countries have always been facing the problem of fiscal space. If government expenditures exceed its optimal level, it will lead to a debt burden and affects economic progress negatively.

Figure 5.12: Environment Dimension and Financial Inclusion

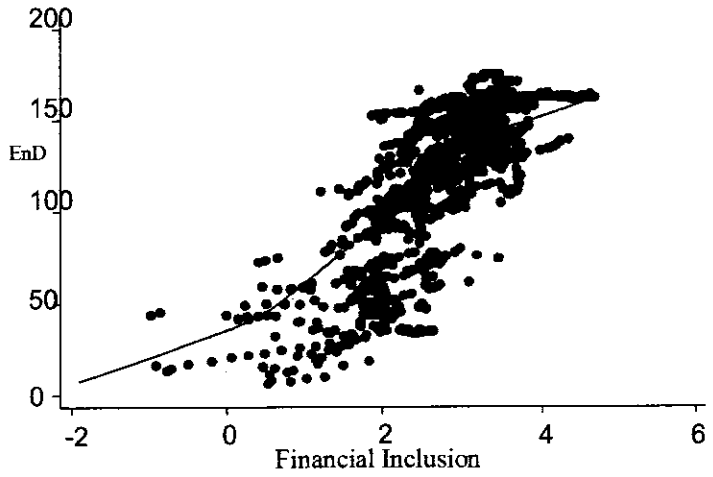
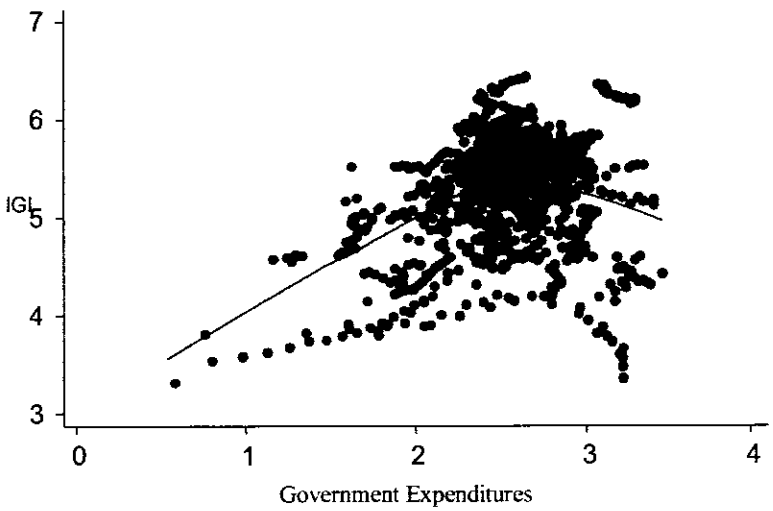


Figure 5.13: Inclusive Growth Index and Government Expenditure



Developing countries rely heavily on tax revenues to finance its public expenditures that in turn lead to inclusive growth. Figure 5.14 shows the scatter plot between inclusive growth index and tax revenue. The graph shows an increase in tax revenue affects inclusive growth positively. Since tax revenue affects all of the three dimensions of inclusive growth positively, its impact on the aggregated index is also positive.

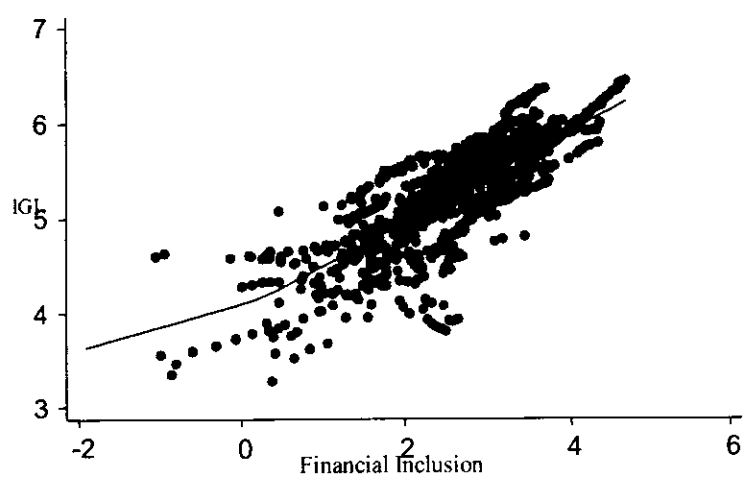
Figure 5.14: Inclusive Growth Index and Tax Revenue

Since the money supply is found to affect the economic, social, and environmental dimensions of inclusive growth positively, the impact of money supply on the overall index of the money supply is also positive. Figure 5.15 shows the scatter plot of the inclusive growth index and monetary policy. The graph also shows that an increase in the money supply brings about an increase in inclusive growth. On the other hand, to assess how financial inclusion affects overall inclusive growth, a scatter plot is given in Figure 5.16 that illustrates the relationship between inclusive growth and financial inclusion. The scatter plot of inclusive growth index and financial inclusion depicts a positive association between them. Figures 5.4, 5.8, and 5.12 have shown that an inclusive

financial structure brings improvement in all three dimensions thus its impact on the aggregated index of inclusive growth is also positive.

Figure 5.15: Inclusive Growth Index and Money Supply

Fig. 5.16: Inclusive Growth Index and Financial Inclusion



5.2 Descriptive Statistics

The statistical summary of the final data used for regression analysis is given in Table 5.1. The statistical description of the data includes a number of observations, Mean, Median, standard deviation, minimum, and maximum value. This study has taken 51 developing countries from 1995 to 2017 thus total observations are 1173 but few data points are missing on the control variables HCI and IQ are missing and they have 1148 and 1165 observations, respectively. Mean is a measure of central tendency and it indicates a numerical value that represents the whole set of values of a variable. Median is also a measure of central tendency and gives the middle value of an arrayed data. A comparison of mean and median value gives a picture of the distribution of the data, that is, whether it is symmetric or skewed. Standard deviation is a measure of dispersion and it shows the variation of each value around the mean value of the variable. The minimum and maximum are the smallest and largest value in a data set and gives an idea about the range of data. The mean value of the economic dimension 4.74 whereas its median is greater than its mean value which shows that distribution is negatively skewed. The value of the standard deviation is 0.966 which indicates that there is somewhat deviation around the mean value.

The minimum and maximum values are -2.7 and 6.62 respectively showing a considerable level of dispersion in the data. The mean value of the social dimension index is 4.6 and the median is 4.67 as the values are closer to each other we can suppose a symmetric distribution. The value of the standard deviation is 0.334 while the minimum and maximum values are 3.51 and 5.19. The environment dimension has a mean value of 4.68 and its median value is greater than the mean value indicating a negatively skewed

dispersion. The value of standard deviation is 0.485and the minimum and maximum values of 2.1 and 5.1 show a moderate level of dispersion. The average value of the inclusive growth index is 5.27 and the median value is 5.36 there is a little difference between the two values thus we can conclude that the distribution is slightly skewed to the left. The standard deviation is 0.542 which shows a significant deviation of the values around the mean value. The minimum and maximum values of inclusive growth index are 3.28 and 6.432 respectively.

Table 5.1: Descriptive Statistics

Variable	Obs	Mean	Median	Std.Dev.	Min	Max
ED	1173	4.745	4.910	.966	-2.7	6.62
SD	1173	4.608	4.679	.334	3.514	5.197
EnD	1173	4.68	4.839	.485	2.105	5.145
IGI	1173	5.275	5.362	.542	3.28	6.432
G	1173	2.518	2.539	.382	.538	3.451
TAX	1173	2.655	2.653	.416	-.249	3.812
MONEY	1173	3.775	3.798	.592	1.05	5.34
IFI	1173	2.611	3.102	.903	-1.912	4.734
K	1148	3.085	2.177	.318	.742	3.92
HCI	1165	5.358	3.102	.233	4.713	5.921
TRADE	1173	4.187	4.175	.438	2.75	5.395
IQ	1173	4.62	4.680	.323	2.454	5.194

Notes: ED is Economic Dimension, SD is social Dimension, EnD is Environmental Dimension, IGI is Inclusive Growth Index, G is Government Expenditure, TAX is Tax Revenue, IFI is Index of Financial Inclusion, HCI is Human Capital Index, IQ is Institutional Quality, K is Capital.

The average value of the log of government expenditures as a ratio of GDP is 2.51 whereas the median is 2.53, thus we can believe that the distribution of the log of government expenditures is symmetric. The standard deviation is 0.382 which is reasonable whereas the minimum and maximum values are 0.538 and 3.451 respectively. In contrast, the mean value of the log of tax revenue as a percentage of GDP is 2.655and the median is 2.653 showing a symmetric distribution. The standard deviation is 0.41 whereas the minimum and maximum values of -0.249 and 3.812 respectively show a significant level of dispersion. The variable log of money supply gives a mean of 3.77 and its median is 3.79 showing that distribution is to some extent symmetrical whereas the deviation of values around the mean is 0.592. The maximum and minimum values are observed to be 1.05 and 5.34 respectively. The average value of the index of financial inclusion is found to be 2.61 whereas the median value of 3.1 is greater than its mean value thus the distribution of this variable is negatively skewed. The standard deviation shows a substantial amount of deviation around the mean whereas the minimum and maximum values are -1.91 and 4.73 respectively shows the dispersion in the data.

Log of gross fixed capital formation as a percentage of GDP shows an average of 3.08 and a median of 2.17 showing that distribution is skewed to the left. The value of standard deviation is 0.318 and the minimum and maximum values are 0.74 and 3.9 respectively. The value of the mean and median of the log of the human capital index are 5.35 and 3.1 respectively and shows that distribution is skewed negatively. The value of standard deviation is only 0.233 whereas the minimum and maximum values of 4.71 and 5.92 respectively show a moderate dispersion in the data. The average value of the log of trade is 4.18 and the median is 4.17, thus the distribution of the log of trade is symmetric

whereas the value of standard deviation is 0.438. While the minimum and maximum values are 2.75 and 5.39 respectively. The log value of institutional quality shows an average of 4.62 and its median is 4.68 that shows that distribution is nearly symmetric.

The correlation matrix of the variables in the regression analysis showing the pair-wise correlations used is given in Table 5.2. The correlation coefficient measures the existence of a linear relationship between variables. The economic dimension index is positively correlated with all the variables but in the case of trade, the correlation coefficient is very small. Correlation between social dimension and all other variables is observed to be positively correlated except for negative trade. The environmental dimension is also positively correlated with all the variables except for negative trade. Correlation coefficients of social dimension with inclusive growth index, money, financial inclusion, and money supply are above 0.5. Inclusive growth index is observed to be positively correlated with all variables but highly and positively correlated with money supply, financial inclusion, and human capital.

The values of the correlation coefficient of government expenditure with other candidate repressors are small except for tax revenue because, in developing countries, tax revenues are considered as the main source to finance government expenditures whereas correlations between other regressors are also positive. There exist positive but weak correlations of the money supply with other regressors whereas the coefficient value is relatively high in the case of financial inclusion and money supply. Financial inclusion is found to be positively correlated with human capital and the value of the correlation coefficient is 0.52. However, it is observed that trade, institutional quality, and capital are positively but weakly correlated with other regressors.

Table 5.2: Correlation Matrix

Variable	ED	SD	EnD	IGI	G	T	M	IFI	HCI	IQ	Trade	K
ED	1.00											
SD	0.81	1.00										
	(0.00)											
EnD	0.89	0.81	1.00									
	(0.00)	(0.00)										
IGI	0.90	0.88	0.95	1.00								
	(0.00)	(0.00)	(0.00)									
G	0.24	0.20	0.20	0.21	1.00							
	(0.00)	(0.00)	(0.00)	(0.00)								
T	0.38	0.30	0.32	0.33	0.40	1.00						
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)							
M	0.56	0.61	0.56	0.57	0.19	0.33	1.00					
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)						
IFI	0.76	0.74	0.71	0.73	0.14	0.22	0.47	1.00				
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)					
HCI	0.76	0.77	0.67	0.73	0.20	0.32	0.39	0.62	1.00			
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)				
IQ	0.48	0.50	0.47	0.47	0.24	0.40	0.39	0.31	0.49	1.00		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Trade	0.05	-0.01	-0.04	-0.01	0.20	0.35	0.10	0.01	0.16	0.06	1.00	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
K	0.25	0.31	0.20	0.26	0.03	0.09	0.38	0.16	0.15	0.21	0.14	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

Table 5.3 presents continent-wise descriptive statistics. This study uses data of 51 developing countries out of which 18 are African countries, 14 are Asian and 19 belong to Latin America and The Caribbean. The mean value of the inclusive growth index shows that Asian countries are observed to have high inclusive growth whereas growth possesses a low level of inclusiveness in Africa while Africa is making high government spending and thus high tax revenue relative to countries of Asia and Latin America and The Caribbean. The value of the money supply is observed to be highest in Asian countries and lowest in Africa whereas the level of financial inclusion is also high in Asia and low in African countries. The mean value of human capital and institutional quality is high for Asian countries and low for African countries. The mean value of trade openness and capital formation is high in Africa and low in countries of Latin American and The Caribbean.

Table 5.3: Group-wise Descriptive Statistics

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
18 Developing Countries of Africa						
IGI	414	150.6746	129.1546	78.8884	344.9091	26.5853
Govt	414	15.1262	14.3042	5.7779	36.5576	1.9311
Tax	414	17.5349	16.1916	7.7972	45.2529	0.7797
Money	414	40.6068	34.9484	24.8156	120.2610	2.8574
IFI	414	9.9556	8.0000	7.7966	42.3521	0.1478
HCI	413	1.8655	1.8563	0.4083	2.8990	1.1137
IQ	414	61.8829	62.8814	25.8180	139.2841	17.4967
Trade	414	77.8777	73.8696	26.8281	165.6460	25.0419
K	414	21.7957	21.7761	7.4201	50.4062	2.1000

Table 5.3: Group-wise Descriptive Statistics (*Continued*)

14 Developing Countries of Asia						
IGI	322	281.1446	247.5859	123.9035	621.5639	111.7199
Govt	322	12.3592	12.0800	4.3187	26.8475	4.6298
Tax	322	13.2607	13.0431	4.9175	28.71	4.9943
Money	322	73.4634	57.2288	40.0523	208.458	15.6641
IFI	322	26.8965	21.2061	23.0577	113.7582	3.7073
HCI	299	2.3663	2.3429	0.5044	3.72824	1.4497
IQ	319	80.7008	77.8400	20.1370	134.009	36.8010
Trade	322	71.7005	58.0071	41.6773	220.407	22.1672
K	322	26.5251	25.5905	6.8463	48.4123	12.5206
19 Developing Countries of Latin America and The Caribbean						
IGI	437	246.6192	245.0781	71.7675	417.6494	75.3813
Govt	437	12.5158	12.3478	3.4948	22.7345	3.1136
Tax	437	15.0580	13.6982	4.8741	30.7815	4.9817
Money	437	45.5079	43.4343	18.1801	100.36	13.1457
IFI	437	21.9951	20.8931	10.6570	54.62581	3.5967
HCI	436	2.3451	2.4414	0.3738	3.11066	1.4256
IQ	432	64.0889	64.1185	23.1410	128.732	17.4044
Trade	437	67.41437	61.9472	28.5596	166.699	15.6356
K	437	21.32997	20.7693	5.0998	43.7114	11.6871

CHAPTER 6

RESULTS AND DISCUSSION: ECONOMIC DIMENSION OF INCLUSIVE GROWTH

The bird's eye view of the scatter plots given in the previous chapter helps to understand the relationship between the dependent and independent variables, however, this chapter discusses in detail the estimation results of the effect of fiscal and monetary policy along with financial inclusion on the economic dimension of inclusive growth. Panel data estimation techniques used in this study include Pooled OLS, Fixed-effects, random-effects and FE-IV models. During estimation, once we included time dummies to capture time-specific effects but since they were insignificant, we dropped them in this study. Seven models have been presented in this section where the first three models analyze the impact of fiscal and monetary policy variables separately on the economic dimension of inclusive growth while the model 4 and 5, inspects the interactive role of policies. The rest of the models examine the effectiveness of macroeconomic policies in the presence of financial inclusion since a sound and easy to access financial structure makes the system work effectively and removes the financial barriers.

The control variables considered are capital, institutional quality, trade, and human capital, however, to find the most relevant factors for developing countries, this study uses a general-to-specific approach. This approach of general-to-specific was introduced by Hendry (1995) that initially begins with an empirical analysis of a general model that assumes all the possible regressors and reaches a complex model by reducing variables having an insignificant impact on dependent variable while the validity of reductions is checked at each stage. Campos et al. (2005), while reviewing literature and discussing in

detail the advantages and critics of this approach, highlight that it is the best approach of model selection. Many researchers including Hoover and Perez (1999), Ayeh and Lin (2011), Ciccone and Jarociński (2010), and Mohammed (2019) argue that this approach, based on t and F tests, ends up with the best model.

To analyze the impact of government expenditure on the economic dimension, the model considers linear and square of government expenditure because the graphical analysis in section 5.1 shows a quadratic link between government expenditure and inclusive growth and its dimensions. The results of the Pooled OLS (POLS), Fixed Effects (FE hereafter) model, Random Effects (RE hereafter) model, and Fixed Effects-Instrumental Variable model (FE-IV hereafter) model are reported in Table 6.1a. The linear term of government expenditure is significant and positive while the square term is negative and significant in all of the four models that confirm that initially, an increase in government spending causes a positive impact by providing infrastructure facilities and subsidies, etc., whereas higher expenditures put a negative impact on economic dimension because increased government consumption expenditures require huge financing through heavy taxation and local and external debts thus enlarged government size leads to inefficiencies.

The control variables human capital, institutional quality, and physical capital has a positive and significant impact on economic dimension and the results are consistent with the theory whereas the impact of trade in significantly negative in the case of POLS and FE-IV models and insignificant in the case of FE and RE model. An increase in human capital increases economic growth by increasing the productivity of labors and thus increases the employment opportunities for them. There are many studies in the literature that support the positive effect of human capital on the economic dimension of inclusive

growth. Based on Becker's (1962) view. the distribution of income depends on the distribution of individuals' ability and ability depends on human capital investment. Schultz (1963) also finds a positive impact of human capital on income distribution while Fleisher et al. (2010) find in their study that human capital affects growth and its distribution positively, thus it leads to economic inclusiveness.

An increase in investment in physical capital causes a positive effect on growth and helps to generate employment opportunities, therefore, affects the economic dimension positively. To ensure property rights and proper functioning of the economic system corruption-free and efficient institutions are required, therefore institutional quality affects economic dimension positively this result is in accordance with the study of Nirola and Sahu (2019) that explain that effectiveness of government expenditures in achieving its target depends on institutional quality. The impact of trade on economic dimension is found to be negative leading to the conclusion that in developing countries increase in trade openness affects economic growth and employment negatively because the increase in imports hurts the local industries, whereas the export products of developing countries cannot compete for the standards of international markets due to lack of technology (Meschi and Vivarelli, 2009). On the other hand, it also affects the income distributions negatively because the large share of benefits of trade go into the pockets of the rich class (Aradhyula et al., 2007).

Since we have included both the linear and quadratic terms of government spending, to analyze the concluding effect of government expenditure on the economic dimension, a derivative of equation 6.1 has been taken with respect to government expenditure which is given as follows:

$$ED = \alpha_0 + \alpha_1 G_{it} + \alpha_2 G_{it}^2 + \alpha_3{}' Z_{it} + \text{vi} + u_{it} \quad (6.1)$$

$$\frac{\partial ED}{\partial G} = \alpha_1 + 2 * \alpha_2 G_{it}$$

In the above equation, Z is the vector of control variables. The derivative shows that the impact of G on ED is nonlinear, and it is conditional on the levels of G. Thus, it is calculated using different levels of government expenditures, that is, the 25th, 50^{th,} and 75th percentiles, and the results are given in Table 6.1b. The pooled OLS model shows that at lower values, government expenditures are affecting economic inclusiveness positively while the effect is insignificant at the median value, and at higher values effect of government expenditures on the economic dimension is negative and significant. This result is consistent with Barro (1990) that suggests after reaching a peak, an increase in government consumption expenditure results in a decline in economic activities, thus causes a decline in employment as well. Armey (1995) also introduced an inverted U-shaped relationship between public expenditure and growth whereas Hajamini and Falahi (2014) also conclude the existence of the "Barro" curve in developing countries.

FE and RE models show the insignificant effect of government expenditures whereas the FE-IV model shows that at low levels the effect of government expenditure is 0.406 percent and significant that reduces to 0.133 percent as the government size increases however the at higher levels, the impact of government expenditure put a negative impact on the economic dimension.

Table 6.1a: Impact of Government Expenditures on the Economic Dimension

Variables	POLS	FE	RE	FE-IV
G	1.838*** (0.00)	1.482*** (0.002)	1.489*** (0.001)	3.550*** (0.000)
G2	-0.539*** (0.000)	-0.292*** (0.004)	-0.292*** (0.003)	-0.673*** (0.000)
HCI	2.477*** (0.000)	2.847*** (0.000)	2.837*** (0.000)	2.344*** (0.000)
IQ	0.554*** (0.000)	0.218* (0.070)	0.231** (0.036)	0.572*** (0.000)
K	0.333*** (0.000)	0.270*** (0.000)	0.269*** (0.00)	0.358*** (0.000)
Trade	-0.242*** (0.000)			-2.357*** (0.000)
Constant	-14.771*** (0.000)	-14.214*** (0.000)	-14.240*** (0.000)	-15.191*** (0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				6
R-Square	0.669	0.639	0.630	0.681
F-Stat (p-value)	296*** (0.000)	25.521*** (0.000)	138.451*** (0.000)	299.590*** (0.000)
Hausman Test		6.579 (0.254)		
Hansen J Test				0.315 (0.574)

Notes: The dependent variable ED is economic dimension of inclusive growth. G is government spending as a percentage of GDP, whereas G2 is the square of government spending as a percentage of GDP. HCI is human capital index, IQ is institutional quality, K is capital and Trade is trade openness. POLS is pooled OLS, FE is fixed effects model, RE is random effect model. *Hausman* test suggests that RE is preferable however, FE is still used to see the effects of policies on dependent variable after controlling country specific effects and *Hansen-J test* suggests that instruments are valid. P-values are given in parentheses. *, **, *** are 10, 5 and 1 percent levels of significance respectively.

Table 6.1b: Impact of Different Levels of Government Expenditures on Economic Dimension

G	POLS	FE	RE	FE-IV
P25=2.337	0.316***	0.116	0.123	0.406***
	(0.000)	(0.280)	(0.240)	(0.000)
P50=2.540	0.097	-0.003	0.004	0.133**
	(0.101)	(0.982)	(0.972)	(0.010)
P75=2.760	-0.141**	-0.131	-0.124	-0.163**
	(0.059)	(0.380)	(0.391)	(0.014)
Notes: ***,**,* are 1, 5 and 10 percent level of significance respectively. P25, P50 and p75 are the 25th, 50th and 75th percentiles respectively.				

Besides government expenditure, we also analyzed the effect of tax revenue on the economic dimension. Table (6.2) presents the results of models explaining the role of tax revenue on the economic dimension. Effect of human capital, institutional quality, and capital are positive and significant in all models whereas trade openness shows a negative and significant impact in the case of POLS and FE-IV models. The results of POLS and FE-IV models show that tax revenue has a positive and significant impact on the economic dimension because when it comes to equality of income distribution and economic stabilization tax revenue is a prima facie tool.

Our result is in accordance with the study of Okpe (2000) who argues that the prime objective of tax collection is to generate revenue to finance the government's expenditures such as infrastructure and welfare services that help to achieve economic and social targets. Tax through its three functions, that is, allocation, distribution, and stabilization, helps to generate employment opportunities, improve income distribution and stabilize the price level (Musgrave and Musgrave, 1973 and Onoh, 2007). Thus, a moderate level of taxation helps developing economies to reduce the debt burden and

encourages economic inclusiveness. F-statistics value for all the models is significant at 1 percent level of significance.

Table 6.2: Impact of Tax Revenue on the Economic Dimension

Variables	POLS	FE	RE	FE-IV
TX	0.375***	0.291	0.288	0.372***
	(0.00)	(0.244)	(0.221)	(0.000)
HCI	2.592***	2.866***	2.854***	2.482***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.492***	0.252**	0.259***	0.545***
	(0.000)	(0.010)	(0.003)	(0.000)
K	0.287***	0.219***	0.221***	0.325***
	(0.000)	(0.006)	(0.004)	(0.000)
Trade	-0.314***			-0.296***
	(0.000)			(0.000)
Constant	-12.018***	-13.252***	-13.226***	-11.851***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				5
R-Square	0.657	0.516	0.631	0.660
F-stat	281.245***	29.651***	136.222***	27.431***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		1.690		
		(0.790)		
Hansen J Test				0.654
				(0.418)
Notes: As for Table (6.1a) except that, TX is the tax revenue percent of GDP.				

To assess the role of monetary policy in promoting economic inclusiveness, the impact of money supply on the economic dimension is examined and the results are reported in Table 6.3. The control variables human capital and institutional quality have a positive impact whereas, in the case of the POLS model, capital doesn't have a significant impact on the economic dimension. The rest of the models show a positive and significant effect of money supply on the economic dimension. Trade is observed to be harming economic

inclusiveness in the case of POLS and FE-IV models while the impact of trade openness on economic dimension is found to be insignificant in FE and RE models.

Table 6.3: Impact of Money Supply on Economic Dimension

Variables	POLS	FE	RE	FE-IV
M	0.396***	0.257**	0.262**	0.380***
	(0.000)	(0.037)	(0.019)	(0.000)
HCI	2.444***	2.445***	2.452***	2.339***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.487***	0.275**	0.287***	0.450***
	(0.000)	(0.015)	(0.006)	(0.000)
K		0.224***	0.22***	0.17*
		(0.005)	(0.003)	(0.070)
Trade	-0.199***			-0.188***
	(0.000)			(0.000)
Constant	-11.296***	-11.317***	-11.416***	-11.069***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				4
R-Square	0.675	0.518	0.661	0.700
F-Stats	353.521***	27.059***	112.391***	353.200***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		2.481		
		(0.650)		
Hansen J				0.495
				(0.481)
Notes: As for Table 6.1a, except that M is money supply.				

All of the four models show a positive and significant impact of money supply on the economic dimension. An increase in the money supply by stimulating aggregate demand affects the level of output, employment, and income distribution. An increase in the level of economic activity to a decreased interest rate provokes many entrepreneurs to start a business and expands the opportunity for the maximum people to get the status of employed. This result is in accordance with Lucas (1972) and Barro (1976). The studies view that money supply affects economic activities significantly if the change is

unperceived. Romer and Romer (1998) and Fowler and Wilgus (2005) are of the view that an increase in money supply by stabilizing aggregate demand creates a cyclical boom and improves income distribution. Thus, the result shows that money supply, by improving income distribution patterns and creating employment opportunities affects the economic dimension of inclusive growth positively. The value of F-statistics is significant in all of the four models hence confirms overall significance.

The analysis of results in Table 6.1 to 6.3 shows that fiscal policy tools and money supply have a positive significant impact on the economic dimension of inclusive growth while to assess the interactive role of fiscal and monetary policy in promoting economic inclusiveness, the model given in equation (6.2) includes government expenditure, money supply, and their interactive term. To explore the effect of money supply and government expenditure on economic dimension derivative of the equation (6.2) with respect to government expenditures and money supply is taken and the derivatives are as follows:

$$ED_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 G_{it} + \beta_3 G_{it}^2 + \beta_4 M * G_{it} + \beta_5 M * G_{it}^2 + \beta'_6 Z_{it} + \text{vi} + u_{it} \quad (6.2)$$

$$\frac{\partial ED}{\partial M} = \beta_1 + \beta_4 G_{it} + \beta_5 . G^2$$

$$\frac{\partial ED}{\partial G} = \beta_2 + 2.\beta_3 . G_{it} + \beta_4 M_{it} + 2\beta_5 M * G_{it}$$

The derivative of the ED equation with respect to M shows that the effectiveness of money supply is conditional on the levels of G, while the derivative of the equation with respect to G shows that the impact of G on ED is conditional not only on levels of M but also on G because G is non-linearly related to ED.

Results in Table 6.4a show that human capital, physical capital, and institutional quality affect economic dimension positively and the coefficients are significant at a 1 % level of significance. Investment in physical capital generates employment opportunities while investment in human capital helps to increase the productivity of laborers and therefore increases employment opportunities for them. Institutional quality ensures the proper implementation of policies without any loopholes. The impact of trade openness is significant in POLS and FE-IV models only and it negatively affects the economic dimension because imports are greater than exports in developing countries that hinder the growth of domestic industries.

To analyze the impact of money supply given the level of government expenditure in enhancing the economic dimension of inclusive growth, 25^{th}, 50^{th} and 75^{th} percentile of government spending has been considered. Table 6.4b analyzes the impact of money supply given different levels of government expenditures. Results indicate that the effect of money supply in promoting economic inclusiveness is positive and significant at all levels of government expenditures. The high coefficient values shows high elasticities, that is, 1 percent increase in money supply increases economic dimension by more than 1 percent because it promotes participation of the individuals and improves income distribution through its credit and interest rate channel. However, it is observed that at the higher levels of government expenditures, the effect of money supply increases because at higher government expenditures, there comes the role of the money supply which is called seigniorage and thus affects economic dimension positively. This result is in accordance with the view of Chileshe and Kafula (2015) who argue that to finance high government expenditures, the government relies on tax revenue, debts, and seigniorage.

The first two may have negative consequences in the long run thus government prefers to finance its expenditures through seigniorage, thus it serves to stimulate economic activity

Table 6.4a: Interactive Role of Money Supply and Government Expenditure on Economic Dimension

Variables	POLS	FE	RE	FE-IV
M	0.592 (0.366)	0.082 (0.860)	0.061 (0.899)	1.811* (0.070)
G	3.562* (0.080)	2.192 (0.234)	2.101 (0.264)	7.669** (0.020)
G2	-0.725* (0.100)	-0.617 (0.226)	-0.594 (0.252)	-1.458** (0.030)
M*G	-0.231 (0.681)	-0.138 (0.780)	-0.108 (0.836)	-1.100 (0.190)
M*G2	0.054 (0.644)	0.078 (0.560)	0.071 (0.606)	0.210 (0.240)
HCI	2.279*** (0.000)	2.274*** (0.000)	2.283*** (0.000)	2.211*** (0.000)
IQ	0.383*** (0.000)	0.188** (0.040)	0.206** (0.020)	0.261*** (0.000)
K	0.151*** (0.010)	0.238*** (0.000)	0.233*** (0.000)	0.239** (0.010)
Trade	-0.233*** (0.000)			-0.250*** (0.000)
Constant	-14.398*** (0.000)	-11.510*** (0.000)	-11.577*** (0.000)	-19.290*** (0.000)
No. of obs.	1147	1147	1147	947
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.703	0.553	0.661	0.719
F-Stats	234.080*** (0.000)	22.858*** (0.000)	112.388*** (0.000)	199.259*** (0.000)
Hausman Test		5.530 (0.470)		
Hansen J Test				0.018 (0.894)

Notes: As for Table 6.1a, except that, M is money supply, M*G is the interaction of money supply and government expenditures and M*G2 is the interaction of money supply and the square of government expenditures.

Table 6.4b: Impact of Money Supply Given Government Spending Levels on Economic Dimension

G	POLS	FE	RE	FE-IV
P25=2.337	0.349***	0.187**	0.196**	0.370***
	(0.000)	(0.040)	(0.036)	(0.000)
P50=2.540	0.360***	0.237***	0.244***	0.350***
	(0.000)	(0.010)	(0.008)	(0.000)
P75=2.760	0.368***	0.298***	0.303***	0.351***
	(0.000)	(0.010)	(0.009)	(0.000)
Notes: As for Table 6.1b.				

The impact of government spending at different levels of the money supply is shown in Table 6.4c. The models of POLS and FE-IV indicate that if government expenditure is at the 25th percentile, there will be a positive impact of government expenditures at all level of money supply, however, the results of FE and RE models show that a low level of government expenditure fails to spur economic growth and doesn't improve economic inclusiveness, however, the effect of government spending is positive and significant at a higher level of the money supply. When government expenditures are at the median level, it doesn't affect economic growth, employment, and income distribution but the FE-IV model shows that the effect of government expenditures will be effectively provided a high money supply.

The models of POLS and FE-IV show that a high level of government expenditures at the 75th percentile affects economic growth negatively because if the money supply is already high, then there will be inflationary pressure that hits the economic stability negatively. This result is consistent with the study of Aghevli and Khan (1977) who suggest that inflationary pressure created by increased money supply causes government expenditures to increase faster than revenue thus causes a budget deficit that affects

economic stability. Through the inflation channel, the effect of monetary policy on income distribution is negative (Taghizadeh-Hesary et al., 2019). Overall, the results suggest that a low level of government expenditure, given any level of money supply, effectively improves the economic dimension.

Table 6.4 c: Impact of Government Expenditures Given Money Supply Levels on Economic Dimension

Money	POLS	FE	RE	FE-IV
		G=P25		
P25=3.438	0.255***	0.090	0.095	0.428***
	(0.000)	(0.466)	(0.444)	(0.000)
P50=3.798	0.260***	0.172	0.176	0.371***
	(0.00)	(0.146)	(0.125)	(0.000)
P75=4.118	0.269***	0.245*	0.248*	0.330***
	(0.000)	(0.070)	(0.055)	(0.000)
		G=P50		
P25=3.438	0.03	-0.051	-0.046	0.118
	(0.633)	(0.700)	(0.730)	(0.117)
P50=3.798	0.05	0.042	0.045	0.101**
	(0.312)	(0.710)	(0.675)	(0.036)
P75=4.118	0.07	0.125	0.126	0.087**
	(0.112)	(0.333)	(0.299)	(0.044)
		G=P75		
P25=3.438	-0.200**	-2.041	-0.200	-0.207*
	(0.040)	(0.202)	(0.213)	(0.064)
P50=3.798	-0.171***	-0.090	-0.098	-0.190***
	(0.000)	(0.403)	(0.405)	(0.005)
P75=4.118	-0.158***	-0.004	-0.069	-0.176***
	(0.000)	(0.975)	(0.960)	(0.002)
Notes: As for Table 6.1b.				

Having discussed the composite impact of government expenditures and money supply, this study also analyzes the composite impact of tax revenue and money supply on the economic dimension. The results in Table 6.5a display the interactive role of tax revenue and money supply. All of the models show that the impact of human capital, institutional quality, and capital on the economic dimension is positive and significant whereas the

impact of trade on the economic dimension is negative. These results are consistent with the literature and have been discussed in detail previously while discussing Table 6.1a. The coefficient value of money supply and tax revenue is positive and significant whereas their interactive term is negative and significant in the POLS and FE-IV model.

Table 6.5a: Impact of Tax Revenue and Money Supply on Economic Dimension

Variables	POLS	FE	RE	FE-IV
M	0.672***	0.315**	0.325***	0.721***
	(0.000)	(0.011)	(0.000)	(0.000)
TX	0.765***	0.414	0.421**	0.789***
	(0.000)	(0.101)	(0.090)	(0.000)
TX*M	-0.132***	-0.033	-0.035	-0.141***
	(0.000)	(0.590)	(0.540)	(0.000)
HCI	2.451***	2.489***	2.489***	2.360***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.332***	0.229**	0.236**	0.289***
	(0.000)	(0.031)	(0.012)	(0.000)
K	0.105*	0.223**	0.222***	0.211**
	(0.070)	(0.011)	(0.000)	(0.011)
Trade	-0.279***	-0.193**	-0.201**	-0.250***
	(0.000)	(0.041)	(0.020)	(0.000)
Constant	-12.334***	-11.517***	-11.547***	-12.190***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				7
R-Square	0.689	0.541	0.682	0.709
F-stat	274.521***	30.871***	239.967***	285.566***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		1.700		
		(0.971)		
Hansen J Test				0.372
				(0.541)

Notes: As for Table 6.1a, except that TX*M is the interaction of tax revenue and money supply.

The equation of the above models along with derivatives is as follows

$$ED_{it} = \gamma_0 + \gamma_1 M_{it} + \gamma_2 TX_{it} + \gamma_3 M * TX_{it} + \gamma_4' Z_{it} + \text{vi} + u_{it} \quad (6.3)$$

$$\frac{\partial ED}{\partial M} = \gamma_1 + \gamma_3 TX_{it}$$

$$\frac{\partial ED}{\partial TX} = \gamma_2 + \gamma_3 M_{it}$$

The derivative of ED with respect to M shows that different levels of tax revenue influence the effectiveness of the money supply. Similarly, the derivative of ED with respect to TX illustrates that the impact of tax on ED is conditional on different levels of money. After taking derivative with respect to M, the 25th, median, and 75th percentile value of tax revenue has been considered and the results are reported in Table 6.5b. Results of all of the models indicate that money supply has a positive and significant effect on economic dimension at all levels of tax revenue that leads to the conclusion that an increase in money supply by reducing interest rate causes an increase in output and employment level, however, the value of coefficient decreases with the increase in tax revenue due to the distortionary effect of high taxes and this result is in line with the study of Evans and Amey (1996) who argue that positive costs are associated with raising revenue through taxation but financing through seigniorage results in efficiency gains.

Table 6.5b: Impact of Money Supply Given Tax Revenue Levels on Economic Dimension

TX	POLS	FE	RE	FE-IV
P25=2.39	0.358***	0.236**	0.242**	0.368***
	(0.000)	(0.019)	(0.011)	(0.000)
P50=2.654	0.320***	0.227**	0.232**	0.329***
	(0.000)	(0.039)	(0.024)	(0.000)
P75=2.928	0.280***	0.218*	0.223**	0.289***
	(0.000)	(0.072)	(0.049)	(0.000)
Notes: As for Table 6.1b				

To capture the effect of tax revenue given money supply, the 25th, median, and 75th percentile value of the money supply is considered. The models of POLS and FE-IV in Table 6.5c shows a positive and significant impact of tax revenue on economic dimension at all levels of money supply because it is used to finance public expenditure such as infrastructure and also helps to correct income distribution while FE and RE models show the insignificant impact of tax revenue. The coefficient value of tax revenue in both POLS and FE-IV models reduces with the increase in the level of the money supply. This result is consistent with the Olivera-Tanzi effect introduced by Olivera (1967) and Tanzi (1977) that suggests high inflation induced by increased money supply causes a reduction in tax revenue. Thus, its effect on the economic dimension reduces with the increase in the level of the money supply.

Table 6.5c: Impact of Tax Revenue Given Money Supply Levels on Economic Dimension

Money	POLS	FE	RE	FE-IV
P25=3.438	0.310***	0.300	0.302	0.281***
	(0.000)	(0.214)	(0.193)	(0.000)
P50=3.798	0.260***	0.288	0.289	0.227***
	(0.000)	(0.252)	(0.227)	(0.000)
P75=4.118	0.222***	0.271	0.278	0.180***
	(0.000)	(0.288)	(0.261)	(0.000)
Notes: As for Table 6.1b				

Financial inclusion influences the effectiveness of monetary policy and to evaluate the interactive role of macroeconomic policies along with financial inclusion, the model given in equation (6.4) includes financial inclusion, money supply, and government spending along with their interactive terms. Table 6.6 shows the result of the interactive role of money supply and government expenditure and financial inclusion. Results

indicate that the control variables human capital, institutional quality, and capital put a positive and significant impact on the economic dimension by increasing opportunities to participate in the growth process whereas only the results of POLS and FE-IV models indicate a negative and significant impact on economic dimension whereas the impact of trade is insignificant in case of RE and FE models. To explore the impact of macroeconomic policies and financial inclusion along with their interactive term, we take the derivative of the model given in equation (6.4) with respect to the money supply, government expenditures, and index of financial inclusion.

$$ED_{it} = \delta_0 + \delta_1 M_{it} + \delta_2 G_{it} + \delta_3 G_{it}^2 + \delta_4 IFI_{it} + \delta_5 M * G_{it} + \delta_6 M * G_{it}^2 + \delta_7 IFI * M_{it} + \delta_8{}' Z_{it} + \text{vi} + u_{it} \quad (6.4)$$

$$\frac{\partial ED}{\partial M} = \delta_1 + \delta_5 G_{it} + \delta_6 . G_{it}^2 + \delta_7 IFI_{it}$$

$$\frac{\partial ED}{\partial G} = \delta_2 + 2\delta_3 G_{it} + \delta_5 M_{it} + 2.\delta_6 M * G_{it}$$

$$\frac{\partial ED}{\partial IFI} = \delta_4 + \delta_7 M_{it}$$

The derivative of equation (6.4) with respect to M shows that different levels of G and IFI influence the effectiveness of the money supply. Similarly, the derivative of ED with respect to G illustrates that the impact of government expenditure on the economic dimension is conditional on different levels of money and financial inclusion. The derivative of equation (6.4) with respect to IFI shows that level of money supply influences the effectiveness of financial inclusion.

Table 6.6a: Effect of Money Supply, Government Expenditures and Financial Inclusion on Economic Dimension

Variables	POLS	FE	RE	FE-IV
M	0.919 (0.132)	0.080 (0.888)	0.050 (0.922)	2.444*** (0.000)
G	3.800** (0.040)	2.169 (0.206)	2.020 (0.250)	9.333*** (0.000)
G2	-0.661 (0.101)	-0.530 (0.246)	-0.489 (0.291)	-1.680*** (0.00)
IFI	0.400** (0.022)	0.080 (0.362)	0.100 (0.681)	0.409** (0.011)
M*G	0.456 (0.361)	-0.155 (0.761)	-0.111 (0.833)	-1.959** (0.000)
M*G2	0.069 (0.533)	0.050 (0.667)	-0.040 (0.733)	0.347** (0.021)
IFI*M	1.002 (0.955)	0.040 (0.461)	0.037 (0.512)	0.004 (0.911)
HCI	1.544*** (0.000)	1.589*** (0.000)	1.643*** (0.000)	1.444*** (0.000)
IQ	0.338*** (0.000)	0.1589*** (0.000)	0.190** (0.021)	0.222** (0.042)
K	0.171*** (0.000)	0.210*** (0.000)	0.211*** (0.000)	0.200* (0.090)
Trade	-0.150*** (0.000)			-1.444*** (0.000)
Constant	-12.131*** (0.000)	-8.010*** (0.000)	-8.348*** (0.000)	-18.289*** (0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				10
R-Square	0.779	0.755	0.758	0.780
F-Stats	267.090*** (0.000)	29.800*** (0.000)	318.321*** (0.000)	334.500*** (0.000)
Hausman Test		29.801*** (0.000)		
Hansen J Test				0.346 (0.556)

Notes: As for Table 6.1a. M*G is the interaction of money supply and government spending, M*G2 is the interaction of money supply and squared government spending, IFI is index of financial inclusion and IFI*M is the interaction of financial inclusion index and money supply. *Hausman* test suggests that FE is preferable however; RE is still used to see the effects of policies on the dependent variable after controlling random effects.

To analyze the impact of money supply given government spending and financial inclusion, 25th, median, and 75th percentile value money supply and financial inclusion have been considered and the results are given in Table 6.6b. Given the level of government expenditures equal to the 25th percentile, the models of FE and RE indicate an insignificant impact of money supply at all levels of financial inclusion whereas, at higher levels of government expenditures, money supply tends to affect economic inclusiveness positively.

Table 6.6b: Impact of Money Supply Given Government Spending and IFI Levels on Economic Dimension

IFI	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=2.086	0.225***	0.099	0.108	0.269***
	(0.000)	(0.291)	(0.268)	(0.000)
P50=2.718	0.227***	0.125	0.132	0.268***
	(0.000)	(0.217)	(0.206)	(0.000)
P75=3.205	0.228***	0.145	0.150	0.270***
	(0.000)	(0.204)	(0.199)	(0.000)
		G=P50=2.540		
P25=2.086	0.199***	0.122	0.129	0.210***
	(0.000)	(0.141)	(0.128)	(0.000)
P50=2.718	0.20	0.147	0.152*	0.213***
	(0.311)	(0.094)	(0.090)	(0.000)
P75=3.205	0.202***	0.167*	0.17*	0.215***
	(0.000)	(0.095)	(0.091)	(0.000)
		G=P75=2.760		
P25=2.086	0.176***	0.151**	0.155**	0.183***
	(0.000)	(0.050)	(0.047)	(0.000)
P50=2.718	0.179***	0.176	0.178**	0.186***
	(0.000)	(0.628)	(0.022)	(0.000)
P75=3.205	-0.180***	0.197**	0.196**	0.188***
	(0.000)	(0.030)	(0.027)	(0.000)
Notes: As for Table 6.1b				

The POLS and FE-IV models show that at all levels of government expenditures, the positive and significant effect of an increase in money supply on the economic dimension of inclusive growth increases with an increase in the level of financial inclusion. Easy

access to finance helps everyone to participate in productive economic activities and thus affects economic growth and its distribution positively. This result is compliant with Williamson (2010) who suggests that the effect of changes in money supply reaches those who regularly trade in financial markets and thus a rise in money supply results in redistribution of wealth towards those having easy access to and frequent use of financial instruments. Whereas the given level of financial inclusion, effective money supply reduces with the increase in government expenditures due to inflationary pressure and affects growth and income distribution negatively.

Results in Table 6.6c show the impact of government expenditure given different levels of the money supply. The models of FE and RE show an insignificant impact of government expenditure on the economic dimension whereas the POLS and FE-IV models show different results at different levels of government expenditure and money supply. According to the POLS model, a low level of government expenditure affects the economic dimension positively while the effect reduces with an increase in the money supply. The effect of the median level of government expenditure on the economic dimension is insignificant. On the other hand, high government expenditures, given the median to a high level of money supply, affect the economic dimension negatively. The model of FE-IV show that at low levels of money supply the impact of government expenditure is positive but at the median level of money supply, the effect of government expenditure reduces, and at high levels of money supply, the 25^{th} percentile of government expenditure has an insignificant impact on economic dimension because inflation due to money creation causes a decline in production activities and increases the receipts of government expenditures and results in deficit. Whereas high levels of

government expenditures in the presence of high money supply have a negative and significant impact on the economic dimension.

Table 6.6c: Impact of Government Expenditures Given Money Supply Levels on Economic Dimension

Money	POLS	FE	RE	FE-IV
G=P25=2.337				
P25=3.438	0.241***	0.045	0.055	0.308***
	(0.000)	(0.701)	(0.637)	(0.000)
P50=3.798	0.190***	0.081	0.088	0.185***
	(0.000)	(0.496)	(0.440)	(0.000)
P75=4.118	0.143***	0.113	0.118	0.076
	(0.000)	(0.388)	(0.340)	(0.146)
G=P50=2.540				
P25=3.438	0.068	-0.092	-0.082	0.111*
	(0.258)	(0.443)	(0.499)	(0.058)
P50=3.798	0.026	-0.049	-0.042	0.039
	(0.532)	(0.643)	(0.674)	(0.310)
P75=4.118	-0.011	-0.107	-0.007	-0.024
	(0.793)	(0.927)	(0.944)	(0.557)
G=P75=2.760				
P25=3.438	-0.119	-0.243*	-0.231	-0.103
	(0.130)	(0.088)	(0.106)	(0.204)
P50=3.798	-0.151***	-0.190	-0.184	-0.119**
	(0.004)	(0.100)	(0.096)	(0.017)
P75=4.118	-0.179***	-0.144	-0.143	-0.135**
	(0.001)	(0.265)	(0.229)	(0.014)
Notes: As for Table 6.1b.				

To assess the effect of financial inclusion on the economic dimension, the 25th, 50th and 75th percentile value of money supply has been used. Table 6.6d shows that financial inclusion affects the economic dimension positively and significantly at all levels of the money supply. Bagehot (1873) was the first to recognize the role of development in the financial sector in facilitating capital mobilization and increasing industrialization. At high levels of money supply, easy access to financial services by all households irrespective of their income levels helps the benefits of the money supply to reach

everyone in the economy and makes them able to improve their living standards. This result is supported by Mugo and Kilonzo (2017) who are of the view that in developing countries, financial inclusion leads to a reduction of poverty and economic development because increased access to financial services sustains the saving-investment cycle and helps the poor to struggle with the adverse effects of economic shocks.

Table 6.6d: Impact of Financial Inclusion Given Money Supply Levels on Economic Dimension

Money	POLS	FE	RE	FE-IV
P25=3.438	0.408***	0.227***	0.231***	0.425***
	(0.000)	(0.011)	(0.008)	(0.000)
P50=3.798	0.409***	0.242***	0.244***	0.426***
	(0.000)	(0.003)	(0.002)	(0.000)
P75=4.118	0.410***	0.255***	0.256***	0.428***
	(0.000)	(0.001)	(0.000)	(0.000)
Notes: As for Table 6.1b				

The previous model discussed the interactive role of government spending and money supply along with financial inclusion however, to assess the composite impact of the money supply with tax revenue and financial inclusion, the model given in equation (6.5) has been formulated. Table 6.7a illustrates the interactive impact of tax revenue, money supply, and financial inclusion. Except for trade openness and interactive term of money supply and tax revenue, all the variables affect the economic dimension significantly and positively. Investment in physical capital creates employment opportunities whereas investment in physical capital makes individuals able to participate in the growth process while institutional quality ensures property rights and a corruption-free environment leads to an increase in economic inclusiveness. In developing regions, trade openness affects economic inclusion negatively because it results in inequality and hurts the local industrial growth.

Table 6.7a: Impact of Money supply, Tax Revenue, and Financial Inclusion on Economic Dimension

Variables	POLS	FE	RE	FE-IV
M	0.803***	0.355**	0.367**	1.034***
	(0.000)	(0.040)	(0.033)	(0.000)
TX	1.306***	0.712**	0.724	1.469***
	(0.000)	(0.020)	(0.151)	(0.000)
IFI	0.311*	0.192	0.199	0.470**
	(0.091)	(0.439)	(0.421)	(0.011)
TX*M	-0.284***	-0.116**	-0.118**	-0.330***
	(0.000)	(0.042)	(0.032)	(0.000)
IFI*M	0.036	0.016	0.015	0.006
	(0.422)	(0.777)	(0.781)	(0.900)
HCI	1.608***	1.788***	1.812***	1.510***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.255***	0.169*	0.184**	0.129*
	(0.000)	(0.061)	(0.030)	(0.062)
K	0.143**	0.189**	0.187**	0.200**
	(0.011)	(0.045)	(0.041)	(0.011)
Trade	-0.169***	-0.173*	-0.182**	-0.140***
	(0.000)	(0.061)	(0.033)	(0.000)
Constant	-9.598***	-8.222***	-8.439***	-9.370***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	946
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.776	0.671	0.766	0.792
F-stat	294.471***	40.044***	398.93***	326.500***
	(0.000)	(0.000)	(0.000)	(0.000)
HausmanTest		14.44		
		(0.108)		
Hansen J Test				2.46
				(0.117)

Notes: As for Table 6.1a, except that TX is tax revenue and TX*M is the interaction of money supply and Tax revenue. Hausman test suggests that RE is preferable. FE is still used to see the effects of policies on the dependent variable after controlling country-specific effects.

To analyze the ultimate impact of money supply, tax revenue, and financial inclusion in the presence of their interactive terms, we take the derivative of the model with respect to

the money supply, tax revenue and index of financial inclusion and the derivatives are as follows:

$$ED_{it} = \emptyset_0 + \emptyset_1 M_{it} + \emptyset_2 TX_{it} + \emptyset_3\, IFI_{it} + \emptyset_4 M * TX_{it} + \emptyset_5 IFI * M_{it} + \emptyset_6{}' Z_{it} + \text{vi} + u_{it} \quad (6.5)$$

$$\frac{\partial ED}{\partial M} = \emptyset_1 + \emptyset_4 TX_{it} + \emptyset_5 IFI_{it}$$

$$\frac{\partial ED}{\partial TX} = \emptyset_2 + \emptyset_4 . M_{it}$$

$$\frac{\partial ED}{\partial IFI} = \emptyset_3 + \emptyset_5 M_{it}$$

The derivative of equation (6.5) with respect to M shows that the impact of money supply on economic dimension is conditional on the level of tax revenue and financial inclusion. The derivative of equation (6.5) with respect to TX shows that the effectiveness of tax is influenced by the level of money supply whereas the derivative of equation (6.5) with respect to IFI shows that the effect of financial inclusion is conditional on the level of the money supply. However, 25th, 50$^{th.}$ and 75th percentile levels of Money supply, tax revenue, and financial inclusion are considered for analysis.

Table 6.7b shows the impact of money supply at different levels of tax revenue and financial inclusion. The models of RE and FE show an insignificant impact of money supply at all levels of financial inclusion and tax revenues. The models of POLS and FE-IV demonstrate that at low levels of tax revenue, money supply affects economic dimension positively and significantly while the effect of money supply strengthens with the increase in financial inclusiveness. On the other hand at the 75th percentile of tax

revenue, the money supply fails to bring any change in economic dimension therefore becomes insignificant even at higher levels of financial inclusion. Hence, we can conclude that the distortionary effect of taxation dominates the positive effects of the money supply.

Table 6.7b: Impact of Money Supply Given Tax Revenue and IFI Levels on Economic Dimension

IFI	POLS	FE	RE	FE-IV
Tax=P25=2.390				
P25=2.086	0.249***	0.134	0.137	0.254***
	(0.00)	(0.261)	(0.235)	(0.000)
P50=2.718	0.262***	0.139	0.142	0.257***
	(0.00)	(0.296)	(0.274)	(0.000)
P75=3.205	0.274***	0.145	0.147	0.259***
	(0.001)	(0.326)	(0.307)	(0.000)
Tax=P50=2.654				
P25=2.086	0.174***	0.103	0.106	0.166***
	(0.001)	(0.414)	(0.391)	(0.000)
P50=2.718	0.187***	0.109	0.111	0.168***
	(0.004)	(0.437)	(0.418)	(0.006)
P75=3.205	0.199**	0.114	0.116	0.17**
	(0.011)	(0.458)	(0.442)	(0.020)
Tax=P75=2.928				
P25=2.086	0.097***	0.072	0.073	0.074
	(0.082)	(0.597)	(0.578)	(0.127)
P50=2.718	0.110	0.077	0.079	0.076
	(0.105)	(0.603)	(0.588)	(0.206)
P75=3.205	0.121	0.083	0.084	0.078
	(0.127)	(0.610)	(0.598)	(0.281)
Notes: As in Table 6.1b.				

To analyze the impact of tax revenue given money supply, the 25th, 50th, and 75th percentile value of the money supply has been considered. Table 6.7c shows the impact of tax revenue on the economic dimension given different levels of the money supply. Results of POLS and FE-IV models give us an idea that tax revenue has a significantly positive effect on the economic dimension at all levels of the money supply. This result is

consistent with the study of Ola (2001) and Jhingan (2004) who argue that raising revenue through taxation aims to finance the provision of public good and redistribution of wealth, thus improves economic inclusiveness. But the coefficient value of tax revenue is observed to be decreasing with an increase in money supply because high values of both tax revenue and money supply add to inflationary pressure, disturbs the economic sustainability, and increases income inequality. Thus, the positive effect of tax on the economic dimension reduces with an increase in the money supply.

Table 6.7c: Impact of Tax Revenue Given Money Supply Levels on Economic Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.331***	0.314	0.318*	0.325***
	(0.000)	(0.104)	(0.092)	(0.000)
P50=3.798	0.229***	0.272	0.275	0.204***
	(0.000)	(0.198)	(0.165)	(0.000)
P75=4.118	0.139***	0.235	0.237	0.097***
	(0.000)	(0.266)	(0.228)	(0.000)
Notes: As for Table 6.1b.				

The effect of financial inclusion on the economic dimension is conditional on money supply therefore, the 25th, 50th and 75th percentile value of money supply is used. Table 6.7d analyzes the impact of financial inclusiveness at different levels of the money supply. The results of all the models show that financial inclusion affects the economic dimension of inclusive growth positively whereas its effect increases with an increase in the level of the money supply.

Table 6.7d: Impact of Financial Inclusion Given Money Supply Levels on Economic Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.434***	0.248***	0.251***	0.486***
	(0.000)	(0.005)	(0.004)	(0.000)
P50=3.798	0.447***	0.254***	0.257***	0.489***
	(0.000)	(0.001)	(0.001)	(0.000)
P75=4.118	0.459***	0.261***	0.261***	0.490***
	(0.000)	(0.000)	(0.001)	(0.000)
Notes: As in Table 6.1b				

Overall, this chapter concludes that fiscal and monetary policy affects the economic dimension of inclusive growth significantly however significant values of interactive terms indicate that the effectiveness of one policy action depends on another policy therefore policy coordination is needed to attain the target of economic inclusion. The control variables, capital, human capital, and institutional quality are found to affect the economic dimension positively in all models whereas trade is observed to affect the economic dimension negatively in developing countries.

CHAPTER 7

RESULTS AND DISCUSSION: SOCIAL DIMENSION OF INCLUSIVE GROWTH

The previous chapter discussed the impact of macroeconomic policies and financial inclusion on the economic dimension of inclusive growth while this chapter analyzes the role of macroeconomic policies and their interaction along with financial inclusion in improving social inclusion. To analyze the effect of policies, the techniques of POLS, FE-IV, FE, and RE models have been employed. The control variables considered are capital, institutional quality, trade, and human capital, however, to find the most relevant factors for developing countries, a general-to-specific approach is used. There are seven models in this section where the first three models analyze the impact of fiscal and monetary policy variables separately on the social dimension of inclusive growth while the model 4 and 5, inspects the interactive role of policies. Model 6 and 7 examine the effectiveness of macroeconomic policies in the presence of financial inclusion in making an inclusive society.

To evaluate the impact of government expenditures on the social dimension, linear and square terms of government expenditures are considered because Figure 5.5 in chapter 5 shows a quadratic link between government expenditures on the social dimension. Table 7.1a explains the impact of government expenditures on the social dimension. Results show that the impact of control variables on human capital, institutional quality, and capital has a positive and significant impact on the social dimension. All of the four models show that capital affects social inclusion positively. Investment in physical capital by affecting the living standard of individuals enables them to invest in education and

health. The availability of more job opportunities also encourages women's participation in developing countries. The coefficient of human capital is positive and significant at a 1 percent level of significance in POLS and FE-IV models whereas in RE and FE models, the value of the coefficient is significant at around 10 percent level of significance. This result is supported by Pogue and Sgontz (1977) who are of the view that investment in human capital helps to reduce the social barriers and increases social security thus, helps to further improve the system of health and education system. The coefficient of institutional quality is also significant and positive. In reference to the view of Worlu and Nkoro (2012), it is believed that corruption-prone environment in developing countries and lack of implementation of rule and regulation is the cause of underdevelopment of many countries thus the result shed light on the importance of institutional quality. The impact of trade on the social dimension is negative in the case of POLS and FE-IV models whereas insignificant in the case of FE and RE models.

The linear term of government expenditure has a significant and positive coefficient whereas the coefficient of the quadratic term is negatively significant. To the ultimate effect of government expenditure on the social dimension, the derivative of equation (7.1) with respect to government expenditure has been taken and the effect is analyzed assuming different levels of government expenditures.

$$SD_{it} = \alpha_0 + \alpha_1 G_{it} + \alpha_2 G_{it}^2 + \alpha_3{}' Z_{it} + \text{vi} + u_{it} \qquad (7.1)$$

$$\frac{\partial SD}{\partial G} = \alpha_1 + 2.\alpha_2 G_{it}$$

In the above equation, Z is the vector of control variables. The derivative shows that the impact of G on SD is nonlinear, and it is conditional on the levels of G. Thus, it is

calculated using different levels of government expenditures, that is, the 25th, 50th and 75th percentiles.

Table 7.1a: Impact of Government Expenditures on Social Dimension

Variables	POLS	FE	RE	FE-IV
G	0.316***	0.628**	0.616***	2.646**
	(0.000)	(0.010)	(0.000)	(0.025)
G2	-0.053**	-0.139**	-0.135***	-0.520**
	(0.011)	(0.010)	(0.010)	(0.031)
HCI	0.954***	1.383*	1.337*	0.755***
	(0.000)	(0.101)	(0.101)	(0.000)
IQ	0.178***	0.072***	0.071***	0.123**
	(0.000)	(0.000)	(0.000)	(0.044)
K	0.182***	0.134***	0.135***	0.233***
	(0.000)	(0.000)	(0.000)	(0.000)
Trade	-0.134***			-0.154***
	(0.000)			(0.000)
Constant	-1.786***	-4.236***	-3.981***	-3.431***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	896
No. of countries	51	51	51	51
No. of instruments				12
R-Square	0.697	0.615	0.641	0.567
F-Stats	527.730***	29.777***	189.210***	206.308***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		23.666***		
		(0.000)		
Hansen J Test				1.566
				(0.218)

Notes: The dependent variable is index of Social Dimension of inclusive growth (SD). G is government spending as a percentage of GDP whereas G2 is the square of government spending as a percentage of GDP. The control variables are HCI (Human capital index), K (Capital), IQ (Institutional Quality) and Trade (Trade openness). *Hausman* test suggests that FE is preferable and Hansen-J test suggests that instruments are valid. P-values are given in parentheses. *, **, *** are 10, 5 and 1 percent level of significance respectively.

The models of POLS and FE-IV in Table 7.1b indicate that at low levels, government expenditures affect social inclusiveness positively and significantly but the value of the

coefficient declines when government expenditures are at the median level whereas the impact of the high level of government expenditures turns out to be insignificant. This result is in compliance with the study of Dollar and Kraay (2002) that suggests that an increase in overall government expenditures has an insignificant impact on education and health.

Table 7.1b: Impact of Different Levels of Government Expenditures on Economic Dimension

G	POLS	FE	RE	FE-IV
P25=2.337	0.673***	0.023	-0.016	0.241***
	(0.000)	(0.672)	(0.765)	(0.001)
P50=2.540	0.045**	-0.079	-0.071	0.031
	(0.010)	(0.260)	(0.302)	(0.400)
P75=2.760	0.022	-0.141	-0.130	-0.196
	(0.361)	(0.124)	(0.144)	(0.136)
Notes: *, **, *** are 10, 5 and 1 percent level of significance respectively. P25, P50 and p75 are the 25th, 50th and 75th percentiles.				

However, since in developing countries productive expenditures get a lower share in overall government consumption expenditures, an increase in government expenditure just causes demand-pull inflation that makes access to education and health more expensive thus in reference to the study of Paternostro et al. (2007) composition of government expenditure plays a big role in targeting the objectives such as economic growth, equity and improving social indicators.

While analyzing the effect of fiscal policy on the social dimension, we also assessed the impact of tax revenue on the social dimension. Table 7.2 explains the role of tax revenue in achieving social inclusiveness. Results indicate that all of the variables are having a positive and significant impact on the social dimension except trade openness which carries a significantly negative coefficient value in the case of POLS and FE-IV models

and insignificant in the case of RE and FE models. Tax revenue is having a slight but positive effect on the social dimension because, in developing countries, the government depends heavily on tax revenue to provide public goods.

Table 7.2: Impact of Tax Revenue on Social Dimension

Variables	POLS	FE	RE	FE-IV
TX	0.063*** (0.000)	0.019 (0.790)	0.018 (0.785)	0.080*** (0.000)
HCI	0.965*** (0.000)	1.394*** (0.000)	1.346*** (0.000)	0.778*** (0.000)
IQ	0.168*** (0.000)	0.114** (0.044)	0.108** (0.033)	0.166*** (0.000)
K	0.178*** (0.000)	0.115** (0.034)	0.118** (0.031)	0.331*** (0.000)
Trade	-0.144*** (0.000)			-0.133*** (0.000)
Constant	-1.464*** (0.000)	-3.803*** (0.000)	-3.525*** (0.000)	-0.911*** (0.000)
No. of obs.	1147	1147	1147	696
No. of countries	51	51	51	51
No. of instruments				15
R-Square	0.657	0.649	0.65	0.65
F-stat	34.231*** (0.000)	10.141* (0.031)	125*** (0.000)	379.622*** (0.000)
Hausman Test		20.4*** (0.000)		
Hansen J Test				2.226 (0.133)
Notes: As for Table 7.1a except that, TX is the tax revenue.				

In reference to the study by Owolabi and Okwu (2011), tax revenue has a positive effect on infrastructure, education, health, and social development. The provision of these public goods helps the socially disadvantaged group, that is, women and low-income groups to have opportunities to be part of society. Public provision of education and health services affects the well-being of women because most of the women are engaged

in the provision of public services. Thus, an effective tax system can create a fiscal space to address gender inequality (Grown & Valodia, 2010).

To assess the role of monetary policy in promoting social inclusion, the impact of money supply on social dimension is examined and the results are reported in Table 7.3. According to FE and RE models, money supply, institutional quality, and human capital have a significantly positive impact on social inclusiveness whereas trade and capital formation do not show any effect on the social dimension. The model of POLS shows that the control variables human capital, institutional quality, and capital formation have a positive and significant impact on the social dimension whereas trade is affecting the social dimension negatively.

According to the FE-IV model, trade does not have any significant impact on the social dimension whereas other variables have a positive effect on the social dimension. The money supply is observed to be affecting the social dimension in all of the four models positively and this result is consistent with the study of Ihsan and Anjum (2013) and they argue that a sound monetary policy devised by the central bank can ensure an inclusive health and education system. In developing countries, at the time of lack of resources, money supply through seigniorage helps the government to finance social goods. On the other hand, an increase in money supply makes the interest rate low that in turn encourages investment in all sectors including health and education.

The results in Table 7.1 to 7.3 shows that fiscal and monetary policy individually affects the social dimension of inclusive growth significantly while to analyze the interactive role of money supply and government expenditure on the social dimension, models in

Table 7.4a includes along with control variables, money supply, government consumption, and their interactive term.

Table 7.3: Impact of Money Supply on the Social Dimension

Variables	POLS	FE	RE	FE-IV
M	0.163***	0.172***	0.177***	0.126***
	(0.000)	(0.000)	(0.000)	(0.000)
HCI	0.887***	1.082***	1.043***	0.724***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.116***	0.124***	0.118***	0.146***
	(0.000)	(0.000)	(0.000)	(0.000)
K	0.094***			0.147***
	(0.000)			(0.000)
Trade	-0.126***			
	(0.000)			
Constant	-1.068***	-2.419***	-2.201***	-0.855***
	(0.000)	(0.011)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	696
No. of countries	51	51	51	51
No. of instruments				15
R-Square	0.748	0.634	0.714	0.71
F-Stat	312***	19.548***	213***	483.53***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		12.270		
		(0.031)		
Hansen J Test				2.270
				(0.131)
Notes: As in Table 7.1a except that, M is money supply. Hausman test suggests that FE is preferable.				

Results in Table 7.4a show that in all of the four models, the control variables human capital affects the social dimension positively whereas except in the FE-IV model, the impact of capital formation is positive and significant in all models. The POLS and FE-IV models show that institutional quality has a positive and significant impact on the social dimension whereas trade openness has a significantly negative impact on the dependent variable in the case of the POLS model.

Table 7.4a: Interactive Impact of Money Supply and Government Expenditures on Social Dimension

Variables	POLS	FE	RE	FE-IV
Money	0.323**	0.185	0.188	0.790***
	(0.021)	(0.372)	(0.361)	(0.000)
G	1.102***	1.322**	1.311**	2.511***
	(0.011)	(0.040)	(0.041)	(0.000)
G2	-0.275***	-0.375**	-0.372**	-0.579***
	(0.000)	(0.031)	(0.022)	(0.000)
M*G	-0.219*	-0.167	-0.166	-0.620***
	(0.061)	(0.382)	(0.379)	(0.010)
M*G2	0.059***	0.059	0.060	0.140*
	(0.010)	(0.194)	(0.171)	(0.000)
HCI	0.853***	1.028***	1.003***	0.800***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.105***			0.111***
	(0.000)			(0.000)
K	0.107***	0.120***	0.119***	
	(0.000)	(0.000)	(0.000)	
Trade	-0.125***			
	(0.00)			
Constant	-1.861***	-2.744***	-2.617***	-3.42***
	(0.000)	(0.010)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.754	0.68	0.71	0.72
F-Stats	434.255***	23.461***	181.444***	433.242***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		4.96		
		(0.665)		
Hansen J Test				2.395
				(0.121)

Notes: As in Table 7.1a except that M*G is the interaction of money supply and government spending and M*G2 is the interaction of money supply with squared government spending. Hausman test suggests that RE is preferable.

To analyze the impact of money supply and government expenditures, a derivative of the model has been taken with respect to government expenditures and money supply and the derivatives are as follows.

$$SD_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 G_{it} + \beta_3 G_{it}^2 + \beta_4 M * G + \beta_5 M * G_{it}^2 + \beta_6' Z_{it} + \text{vi} + u_{it} \quad (7.2)$$

$$\frac{\partial SD}{\partial M} = \beta_1 + \beta_4 G_{it} + \beta_5 {G_{it}}^2$$

$$\frac{\partial SD}{\partial G} = \beta_2 + \beta_3 2G_{it} + \beta_4 M_{it} + \beta_5 2M * G_{it}$$

The derivative of equation (7.2) with respect to M shows that the effectiveness of the money supply depends on levels of government expenditure. The derivative of equation (7.2) with respect to G shows that the impact of government spending on the social dimension is conditional on levels of government expenditures and money supply. The final impact of money supply and government expenditures are analyzed assuming different levels of government expenditures and money supply at 25th, 50th and 75th percentile.

Table 7.4b shows the impact of money supply given government expenditures and the results indicate that money supply affects social dimension at all levels of government expenditures, while at a higher level of government expenditures, money supply through the printing of money finances the expenditures of government on education, health and social protection and thus improve social inclusiveness.

Table: 7.4 b Impact of Money Supply Given Government Spending Levels on Social Dimension

G	POLS	FE	RE	FE-IV
P25=2.337	0.139***	0.120***	0.124***	0.145***
	(0.000)	(0.002)	(0.001)	(0.000)
P50=2.540	0.154***	0.146***	0.149***	0.163***
	(0.000)	(0.000)	(0.000)	(0.000)
P75=2.760	0.176***	0.178***	0.182***	0.196***
	(0.000)	(0.000)	(0.000)	(0.000)
Notes: As for Table 7.1b.				

The result in Table 7.4c shows the effect of government expenditures on the social dimension of inclusive growth. When government expenditure is set at the 25th percentile, the POLS model shows a positive and significant impact on the social dimension at all levels of money supply while FE and RE models show an insignificant impact. The FE-IV model shows that at a lower money supply, the effect of government expenditure is insignificant and at a higher money supply, the effect of government expenditures at the 25th percentile affects social dimension significantly and positively.

If government expenditure is set at the median level, results of FE, RE, and FE-IV models show that if the money supply is less than the median level, government expenditure affects the social dimension negatively while at a higher money supply government expenditure affects the social dimension positively. Setting government expenditures at high levels yield positive results if the money supply is also at a higher level because a higher money supply decreases the cost of borrowing and encourages the government to invest in human and social development.

Table 7.4c: Impact of Government Expenditures Given Money Supply Levels on Social Dimension

Money	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=3.438	0.029**	-0.473	-0.042	-0.007
	(0.036)	(0.392)	(0.421)	(0.657)
P50=3.798	0.052***	-0.007	-0.002	0.014
	(0.000)	(0.892)	(0.962)	(0.296)
P75=4.118	0.071***	0.028	0.034	0.033**
	(0.000)	(0.595)	(0.526)	(0.033)
		G=P50=2.540		
P25=3.438	0.001	-0.116*	-0.111	-0.039**
	(0.918)	(0.070)	(0.071)	(0.042)
P50=3.798	0.032**	-0.067	-0.061	0.0027
	(0.013)	(0.205)	(0.225)	(0.849)
P75=4.118	0.060***	-0.024	-0.018	0.041***
	(0.000)	(0.630)	(0.706)	(0.004)
		G=P75=2.760		
P25=3.438	-0.028	-0.191	-0.184	-0.750***
	(0.215)	(0.108)	(0.171)	(0.007)
P50=3.798	-0.012**	-0.113**	-0.115**	-0.009
	(0.012)	(0.041)	(0.043)	(0.636)
P75=4.118	0.048***	0.081*	0.053**	0.048**
	(0.006)	(0.081)	(0.036)	(0.013)
Notes: As for Table 7.1b.				

The composite effect of money supply and government expenditures suggests that a higher level of government expenditures, given higher money supply, affects social inclusion whereas the interactive role of money supply and tax revenue on social dimension is demonstrated in Table 7.5a. Regarding control variables, the model of POLS shows that human capital, institutional quality, and capital formation have a positive and significant impact and trade has a negative impact on the social dimension. The models of FE and RE show that role of trade in determining social inclusiveness is insignificant while the FE-IV model assumes only human capital and institutional quality as control variables and found a positive and significant impact on the social dimension.

Table 7.5a: Impact of Tax Revenue and Money Supply on Social Dimension

Variables	POLS	FE	RE	FE-IV
M	0.169***	0.169**	0.173***	0.479***
	(0.000)	(0.030)	(0.010)	(0.000)
TX	0.033	-0.008	-0.008	0.440**
	(0.377)	(0.913)	(0.922)	(0.031)
TX*M	-0.003	-0.004	-0.004	-0.127**
	(0.727)	(0.888)	(0.608)	(0.010)
HCI	0.885***	1.074***	1.043***	0.784***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.107***	0.104**	0.100**	0.152***
	(0.000)	(0.060)	(0.048)	(0.000)
K	0.097***	0.096*	0.096*	
	(0.000)	(0.091)	(0.080)	
Trade	-0.132***			
	(0.000)			
Constant	-1.075***	-2.507***	-2.334***	-1.975***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	897
No. of countries	51	51	51	51
No. of instruments				14
R-Square	0.748	0.720	0.718	0.70
F-Stat	593.320***	21.761***	158.090***	399.777***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		4.461		
		(0.615)		
Hansen J Test				2.240
				(0.131)
Notes: As in Table 7.1a except that TX is the tax revenue, M is money supply and TX*M is the interaction money supply and tax revenue. Hausman test suggests that RE is preferable.				

To analyze the final of impact money supply given different levels of tax revenue and the effect of tax revenue given different levels of money supply, derivatives of the above model have been taken with respect to money supply and tax revenue.

$$SD_{it} = \gamma_0 + \gamma_1 M_{it} + \gamma_2 TX_{it} + \gamma_3 M * TX_{it} + \gamma_4{}' Z_{it} + \text{vi} + u_{it} \qquad (7.3)$$

$$\frac{\partial SD}{\partial M} = \gamma_1 + \gamma_3 TX_{it}$$

$$\frac{\partial SD}{\partial TX} = \gamma_2 + \gamma_3 . M_{it}$$

The derivative of the equation (7.3) with respect to M indicates that the impact of money supply on the social dimension is conditional on tax levels. Similarly, the derivative of equation (7.3) with respect to TX shows that the effect of tax revenue on the social dimension is influenced by the levels of the money supply. After taking derivative with respect to the money supply, 25th, 50th, and 75th percentile levels of tax revenue are considered to evaluate the effect of money supply and the results are reported in Table 7.5b.

The results in Table 7.5b indicate that the money supply affects the social dimension positively and significantly at all levels of tax revenue. A higher level of taxes creates distortionary effects in the economy because due to high taxation, workers get discouraged. On the other hand, a high tax rate on goods and services affects an individual's decision of saving and investment that in turn makes the poor section discourage investment in health and education. Therefore, the positive effect of money supply on social inclusion reduces with the increase in tax revenue

Table 7.5b: Impact of Money Supply Given Tax Revenue Levels on Social Dimension

TX	POLS	FE	RE	FE-IV
P25=2.390	0.161***	0.160***	0.164***	0.174***
	(0.000)	(0.002)	(0.001)	(0.000)
P50=2.654	0.160***	0.159***	0.163***	0.140***
	(0.000)	(0.002)	(0.001)	(0.000)
P75=2.928	0.159***	0.158***	0.162***	0.105***
	(0.000)	(0.003)	(0.001)	(0.000)
Notes: As for Table 7.1b.				

To capture the effect of tax revenue given money supply, the 25th, 50th, and 75th percentile value of the money supply is considered. Table 7.5c shows the impact of tax revenue on the social dimension of inclusive growth given different levels of the money supply. The models of FE, RE, and POLS indicate an insignificant impact of tax revenue on social dimension whereas the FE-IV model shows that with money supply at the 25th percentile there is no impact of tax revenue on social inclusiveness whereas given higher levels of money supply, increase in tax revenue leads to affect social inclusion adversely because inflationary pressure created by excess money supply and distortionary effect of taxation combined makes the socially neglected groups worse-off. Thus, the collection of tax revenue given the median to a high level of the money supply is harmful to social inclusion.

Table 7.5c: Impact of Tax Revenue Given Money Supply Levels on Social Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.031	-0.019	-0.021	0.001
	(0.103)	(0.751)	(0.720)	(0.940)
P50=3.798	0.020	-0.021	-0.022	-0.044**
	(0.129)	(0.748)	(0.714)	(0.014)
P75=4.118	0.019	-0.022	-0.023	-0.086***
	(0.167)	(0.748)	(0.713)	(0.000)
Notes: As for Table 7.1b				

The level of financial inclusion in a country affects the strength of monetary policy. To analyze how financial inclusion and fiscal policy actions affect the impact of monetary policy on social inclusion, the model given in equation (7.4) includes financial inclusion, money supply, and government expenditures along with their interactive terms. Results in Table 7.6a explain the impact of money supply, government expenditure, and financial

inclusion on the social dimension. The model of POLS shows that investment in physical capital, human capital, and institutional quality increases social inclusiveness while trade is observed to affect social inclusion negatively. The models of FE and RE models show that among control variables, physical and human capital affects social inclusiveness positively and significantly while trade openness is not a significant determinant of social inclusion. On the other hand, the FE-IV model shows that only the control variables human capital and institutional quality affect the social dimension positively whereas investment in physical capital and trade does not affect the level of social inclusion.

To evaluate the impact of money supply, government expenditures and financial inclusion, a derivative of the model has been taken with respect to the money supply, government expenditure and index of financial inclusion and the derivatives are as follows:

$$SD_{it} = \delta_0 + \delta_1 M_{it} + \delta_2 G_{it} + \delta_3 G_{it}^2 + \delta_4 IFI_{it} + \delta_5 G * M_{it} + \delta_6 M * G_{it}^2 + \delta_7 IFI * M_{it} + \delta_8' Z_{it} + \text{vi} + u_{it} \quad (7.4)$$

$$\frac{\partial SD}{\partial M} = \delta_1 + \delta_5 G_{it} + \delta_6 . G_{it}^2 + \delta_7 IFI_{it}$$

$$\frac{\partial SD}{\partial G} = \delta_2 + \delta_3 2G_{it} + \delta_5 M_{it} + \delta_6 2\, M * G_{it}$$

$$\frac{\partial SD}{\partial IFI} = \delta_4 + \delta_7 M_{it}$$

The derivative of equation 7.4 with respect to M shows that the effect of money supply on social inclusion depends on the levels of government spending and financial inclusion. While the derivative with respect to G indicates that the impact of government spending

on the social dimension is conditional on the levels of money supply and government spending. Moreover, the derivate of equation 7.4 with respect to IFI indicates that the relationship between social inclusion and financial inclusion is dependent on the levels of the money supply.

Table 7.6b exhibits the impact of money supply on the social dimension given different levels of government expenditures and financial inclusion. To examine this conditional impact of money supply on social inclusion, the 25^{th}, $50^{th,}$ and 75^{th} percentile values of government expenditures and financial inclusion have been considered. The model of POLS estimation shows that the effect of money supply on social inclusion is positive at all levels of government expenditures and financial inclusion.

The FE and RE models show an insignificant impact of money supply given a high level of financial inclusion and a low level of government expenditures. However, the model of FE-IV shows that at a low and a median level of financial inclusion, money supply affects social inclusiveness positively and significantly; while at a higher level of financial inclusion, the impact of money supply on social dimension becomes insignificant. This result is in accordance with the study of Subbarao (2009) who examines that financial inclusion enhances the effect of money supply because there exists an inverse relationship between commercial banks' size and inflation rate while the results lead to the conclusion that an increase in the level of financial inclusiveness does not cause a decline in the price of goods. On the other hand, Bucci and Marsiglio (2019) also examine that financial growth may affect economic growth positively but there is an inverse relationship between financial development and social welfare.

Table 7.6a: Impact of Money Supply, Government Expenditures and Financial Inclusion on Social Dimension

Variables	POLS	FE	RE	FE-IV
M	0.525***	0.357*	0.355*	1.239***
	(0.000)	(0.070)	(0.070)	(0.000)
G	1.166***	1.284**	1.264**	2.037***
	(0.000)	(0.022)	(0.022)	(0.000)
G2	-0.259***	-0.342**	-0.335***	-0.450***
	(0.000)	(0.021)	(0.011)	(0.000)
IFI	0.276***	0.258***	0.252***	0.844***
	(0.000)	(0.000)	(0.000)	(0.000)
M*G	-0.288***	-0.182	-0.18	-0.600***
	(0.000)	(0.270)	(0.256)	(0.000)
M*G2	0.066***	0.056	0.055	0.128***
	(0.000)	(0.143)	(0.130)	(0.000)
IFI*M	-0.046***	-0.06***	-0.057***	-0.190***
	(0.000)	(0.000)	(0.000)	(0.000)
HCI	0.661***	1.038***	0.981***	0.555***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.093***			0.089***
	(0.000)			(0.000)
K	0.107***	0.101**	0.100***	
	(0.000)	(0.033)	(0.010)	
Trade	-0.093***			
	(0.000)			
Constant	-1.692***	-3.353**	-3.041***	-3.489***
	(0.000)	(0.041)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	946
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.81	0.742	0.75	0.75
F-Stat	495.009***	336***	559.411***	288.980***
	(0.000)	(0.000)	(0.000)	(0.000)
Huasman Test		33.940		
		(0.000)		
Hansen J Test				2.551
				(0.110)

Notes: As in Table 7.1a except that M is money supply, IFI is index of financial inclusion, IFI*M is the interaction of monetary policy and financial inclusion, M*G is the interaction of Money supply and government spending and M*G2 is the interaction of money supply and squared government spending. Hausman test suggests that FE is preferable.

In developing countries, more weight is given to private investment than public investment because the main focus on these economies is to increase economic growth, therefore, higher levels of financial inclusion do not promote public investment.

Table 7.6b: Impact of Money Supply Given Government Spending Levels on Social Dimension

IFI	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=2.086	0.118***	0.114***	0.119***	0.166***
	(0.00)	(0.003)	(0.001)	(0.000)
P50=2.718	0.089***	0.076*	0.082**	0.046**
	(0.000)	(0.061)	(0.028)	(0.012)
P75=3.205	0.067***	0.474	0.055	-0.046
	(0.000)	(0.282)	(0.174)	(0.267)
		G=P50=2.540		
P25=2.086	0.126***	0.133***	0.137***	0.177***
	(0.000)	(0.001)	(0.000)	(0.000)
P50=2.718	0.096***	0.095**	0.101**	0.057***
	(0.000)	(0.025)	(0.011)	(0.001)
P75=3.205	0.074***	0.066*	0.075*	-0.034
	(0.000)	(0.052)	(0.088)	(0.378)
		G=P75=2.760		
P25=2.086	0.139***	0.158***	0.162***	0.200***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=2.718	0.110***	0.120***	0.126***	0.081***
	(0.000)	(0.010)	(0.004)	(0.000)
P75=3.205	0.081***	0.090***	0.098**	-0.011
	(0.000)	(0.056)	(0.039)	(0.791)
Notes: As for Table 7.1b.				

To assess the impact of government expenditures on social inclusiveness given money supply, the 25th, 50th and 75th percentile value of money supply and government expenditures is used. According to the results in Table 7.6c, the POLS and FE-IV models indicate that setting government expenditure at a low level, affects the social dimension positively and significantly while its impact increases with an increase in money supply because money supply support fiscal policy to achieve its social targets. Whereas the

models of FE and RE show that given different levels of money supply, government expenditures at the 25th percentile and median level do not affect the social dimension significantly while given a high level of money supply, setting government expenditures at the 75th percentile affects social dimension positively and significantly. Because high government expenditures may include a higher proportion of social goods that could be financed through the printing of money.

Table 7.6c: Impact of Government Expenditures Given Money Supply Levels on Social Dimension

Money Supply	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=3.438	0.032***	-0.038	-0.033	0.019
	(0.000)	(0.445)	(0.483)	(0.369)
P50=3.798	0.040***	-0.009	-0.004	0.028*
	(0.000)	(0.854)	(0.92)	(0.075)
P75=4.118	0.047***	-0.017	0.021	0.036**
	(0.000)	(0.730)	(0.664)	(0.025)
		G=P50=2.540		
P25=3.438	0.020	-0.098	-0.092	0.023
	(0.233)	(0.102)	(0.105)	(0.494)
P50=3.798	0.038***	-0.061	-0.055	0.052**
	(0.002)	(0.233)	(0.248)	(0.023)
P75=4.118	0.053***	-0.027	-0.023	0.078***
	(0.000)	(0.562)	(0.609)	(0.000)
		G=P75=2.760		
P25=3.438	0.006	-0.163	-1.156	0.028
	(0.787)	(0.137)	(0.137)	(0.588)
P50=3.798	0.035*	-0.017*	-0.011*	0.078**
	(0.051)	(0.074)	(0.077)	(0.024)
P75=4.118	0.06***	0.007*	0.070**	0.122***
	(0.000)	(0.092)	(0.015)	(0.000)
Notes: As for Table 7.1b.				

Since effective financial inclusion depends on the level of money supply, the 25th, 50th, and 75th percentile value of the money supply is used for analysis. Table 7.6d shows the

impact of financial inclusion conditional on different levels of the money supply. The models of POLS and FE-IV illustrate a positive and significant impact of financial inclusion on the social dimension given different levels of the money supply. Given the level of money supply at a low level, an increase in financial inclusion causes social inclusiveness to increase significantly. Although Zingales (2015) is of the view that most of the financial activities result in higher private return than social return and he doesn't find any link between financial growth and social benefit. Our result is supported by the findings of Sehrawat and Giri (2017) who suggest that a developed financial structure, through the mobilization of resources, raises investment in education and health. Monacelli et al. (2011) are also of the view that the removal of borrowing constraints encourages individuals to invest in education and health that lead to social inclusiveness. However, the magnitude of the effectiveness of financial inclusion reduces with the increase in the level of money supply because access to financial services is not successful in reducing the rising cost of social goods that are induced by increasing the money supply.

Table 7.6d: Impact of Financial Inclusion Given Money Supply Levels on Social Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.117***	0.053**	0.057**	0.189***
	(0.000)	(0.043)	(0.025)	(0.000)
P50=3.798	0.101***	0.032	0.037	0.122***
	(0.000)	(0.238)	(0.154)	(0.000)
P75=4.118	0.086***	0.013	0.018	0.061***
	(0.000)	(0.657)	(0.491)	(0.001)
Notes: As for Table 7.1b.				

To assess the composite impact of tax revenue, money supply, and financial inclusion, the model given in equation (7.5) has been formulated. Table 7.7a explains the interactive role of money supply, tax revenue, and financial inclusion on the social dimension. Results indicate that the control variables human capital and institutional quality play a significant role in increasing social inclusiveness. The impact of capital formation and trade is significant in the case of the POLS model only whereas FE, RE, and FE-IV models do not approve physical capital and trade to be significant determinants of social inclusion because they can indirectly affect social dimension but they are more likely to affect the economic dimension of inclusive growth.

To analyze the impact of tax revenue, money supply, and financial inclusion, a derivative of the model given in equation (7.5) has been taken with respect to the money supply, tax revenue, and financial inclusion index.

$$SD_{it} = \emptyset_0 + \emptyset_1 M_{it} + \emptyset_2 TX_{it} + \emptyset_3 IFI_{it} + \emptyset_4 M * TX_{it} + \emptyset_5 IFI * M_{it} + \emptyset_6' Z_{it} + \text{vi} + u_{it} \quad (7.5)$$

$$\frac{\partial SD}{\partial M} = \emptyset_1 + \emptyset_4 TX_{it} + \emptyset_5 IFI_{it}$$

$$\frac{\partial SD}{\partial TX} = \emptyset_2 + \emptyset_4 M_{it}$$

$$\frac{\partial SD}{\partial IFI} = \emptyset_3 + \emptyset_5 M_{it}$$

The derivative of equation (7.5) with respect to M shows that the effect of money supply on social inclusion depends on levels of tax revenue and financial inclusion. The derivative of equation (7.5) with respect to TX indicates that the impact of tax revenue on

social dimension is conditional on levels of money supply while the derivate of equation (7.5) with respect to IFI indicates that the relationship between social inclusion and financial inclusion is dependent on levels of the money supply.

Table 7.7a: Impact of Tax Revenue, Money Supply and Financial Inclusion on Social Dimension

Variables	POLS	FE	RE	FE-IV
M	0.279***	0.326***	0.325***	0.469***
	(0.000)	(0.000)	(0.000)	(0.000)
TX	0.121***	0.063	0.066	0.234**
	(0.000)	(0.367)	(0.333)	(0.034)
IFI	0.250***	0.292***	0.281***	0.38***
	(0.000)	(0.000)	(0.000)	(0.000)
TX*M	-0.028***	-0.014	-0.016	-0.070**
	(0.000)	(0.455)	(0.356)	(0.020)
IFI*M	-0.038***	-0.067***	-0.062***	-0.058***
	(0.000)	(0.000)	(0.000)	(0.000)
HCI	0.668***	1.077***	1.00***	0.589***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.093***	0.097**	0.091**	0.100***
	(0.000)	(0.031)	(0.030)	(0.000)
K	0.103***			
	(0.000)			
Trade	-0.094***			
	(0.000)			
Constant	-0.695***	-2.959***	-2.528***	-0.998***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	996
No. of countries	51	51	51	51
No. of instruments				10
R-Square	0.81	0.75	0.76	0.78
F-Stat	641.32***	55.19***	527.62***	495.63***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		35.28		
		(0.00)		
Hansen J Test				2.22
				(0.13)

Notes: As in Table 7.1a, except that TX is tax revenue, M is money supply, IFI is the index of financial inclusion, TX*M is the interaction of tax revenue and money supply and IFI*M is the interaction of financial inclusion and money supply. Hausman test suggests that FE is preferable.

To evaluate the impact of money supply on social inclusion, 25th, 50th and 75th percentile levels of tax revenue and financial inclusion has been used. Table 7.7b depicts the impact of money supply given different levels of tax revenue and financial inclusion. The model of POLS shows a significantly positive impact of money supply on social inclusion given different levels of financial inclusion and tax revenue.

Table 7.7b: Impact of Money Supply Given Tax Revenue and IFI Levels on Social Dimension

IFI	POLS	FE	RE	FE-IV
TX=P25=2.390				
P25=2.086	0.082***	0.062	0.074	0.074***
	(0.000)	(0.244)	(0.132)	(0.000)
P50=2.718	0.068***	0.039	0.052	0.050***
	(0.000)	(0.497)	(0.322)	(0.008)
P75=3.205	0.057***	0.018	0.032	0.029
	(0.000)	(0.772)	(0.565)	(0.198)
TX=P50=2.654				
P25=2.086	0.075***	0.059	0.069	0.055***
	(0.000)	(0.272)	(0.155)	(0.000)
P50=2.718	0.061***	0.035	0.047	0.030*
	(0.000)	(0.538)	(0.362)	(0.091)
P75=3.205	0.049***	0.013	0.027	0.011
	(0.000)	(0.819)	(0.617)	(0.638)
TX=P75=2.928				
P25=2.086	0.067***	0.055	0.065	0.036*
	(0.000)	(0.307)	(0.186)	(0.053)
P50=2.718	0.053***	0.031	0.043	0.012
	(0.000)	(0.585)	(0.411)	(0.567)
P75=3.205	0.0428**	0.009	0.023	-0.009
	(0.007)	(0.871)	(0.676)	(0.727)
Notes: As for Table 7.1b				

The FE and RE models show an insignificant impact of the money supply on social inclusiveness. Whereas the model of FE-IV shows that setting financial inclusion at the 25th percentile, the effectiveness of money supply reduces with the increase in tax revenue because both contribute to rising in inflation and the adverse effect of high

taxation restricts the socially neglected group to have access to better education and health. However, at higher levels of financial inclusion, the money supply fails to ensure social inclusiveness.

To examine the impact of tax revenue, given money supply levels, in promoting social inclusiveness, 25th, 50th. and 75th percentile value of money supply are used and the results are reported in Table 7.7c. The models of POLS, RE, and FE show that an increase in tax revenue given any level of the money supply does not improve social inclusion whereas the FE-IV model shows that increasing tax revenue given higher levels of the money supply causes access to social goods and services more difficult thus causes a decline in social inclusiveness.

Table 7.7c: Impact of Tax Revenue Given Money Supply Levels on Social Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.024 (0.151)	0.014 (0.736)	0.011 (0.795)	-0.002 (0.916)
P50=3.798	0.013 (0.222)	0.009 (0.835)	0.004 (0.911)	-0.027** (0.050)
P75=4.118	0.004 (0.686)	0.005 (0.920)	-0.000 (0.991)	-0.049*** (0.003)
Notes: As for Table 7.1b				

Given the different levels of money supply, the impact of financial inclusion on social inclusiveness is given in Table 7.7d. The models of FE and RE show that at low levels of money supply, financial inclusion affects the social dimension of inclusive growth positively while at a higher level of money supply the effect of financial inclusion on the social dimension becomes insignificant.

Table 7.7d: Impact of Financial Inclusion Given Money Supply Levels on Social Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.121***	0.060**	0.065***	0.149***
	(0.000)	(0.018)	(0.008)	(0.000)
P50=3.798	0.107***	0.036	0.043*	0.125***
	(0.000)	(0.160)	(0.080)	(0.000)
P75=4.118	0.095***	0.016	0.024	0.104***
	(0.000)	(0.577)	(0.359)	(0.000)
Notes: As for Table 7.1b				

However, the models of POLS and FE-IV show that the impact of financial inclusion on social inclusiveness is positive and significant for all levels of money supply but the size of effectiveness reduces at higher levels of money supply because increased supply of money causes the cost of social goods to be more expensive.

Overall, the results in this chapter suggest that fiscal and monetary policy through resource mobilization can play a significant and positive role in promoting social inclusion however, these fiscal and monetary policy actions are not independent thus a policy mix is required to achieve the target of an inclusive society. On the other hand, financial inclusion, by providing access to financial aid and instruments, strengthens the impact of money supply in achieving social inclusion. It is also observed through models in Tables 7.4 to 7.7 that among selected control variables physical capital and trade do not affect social inclusion significantly while the impact of human capital and institutional quality on social dimension is significant.

CHAPTER 8

RESULTS AND DISCUSSION: ENVIRONMENT DIMENSION OF INCLUSIVE GROWTH

The third dimension of inclusive growth is the environment dimension. This chapter analyzes the role of fiscal policy, monetary policy, and financial inclusion in improving environmental inclusiveness while chapter 6 and 7 emphasizes the impact of macroeconomic policies and financial inclusion on economic and social dimension respectively. Environment inclusiveness refers to the situation where a clean and green environment is available to everyone irrespective of whether they live in a rural or urban area and their income status. This chapter presents seven models. The first model of this chapter analyzes the impact of government expenditure on the environmental dimension of inclusive growth. The second model examines the impact of tax revenue on environmental inclusion whereas the third model analyzes the impact of the money supply. Models 4 and 5, inspects the interactive role of policies. The rest of the models examine the effectiveness of macroeconomic policies in the presence of financial inclusion in promoting the environmental dimension.

The result of the first model is detailed in Table 8.1a. The results of the POLS and FE-IV model show that the control variables human capital, institutional quality, and capital formation affect the environment dimension positively whereas trade affects the environment negatively. These results are in line with the existing literature. Southgate and Basterrechea (1992) are of the view that human capital formation and scientific base in rural areas lead to the environmentally sound growth of the economy. Whereas regarding institutional quality, studies of Bhattarai and Hamming (2001) and Sulaiman et

al. (2017) suggest that a better quality of institution improves environmental quality by reducing the rate of deforestation. Many studies including the study of Hettige et al. (1992) suggest that trade openness causes developing countries to specialize in the production of commodities that require more labor and natural resources thus harms the environment.

Table 8.1a: Impact of Government Expenditures on Environment Dimension

Variables	POLS	FE	RE	FE-IV
G	2.032***	0.869*	0.879**	2.500***
	(0.000)	(0.060)	(0.055)	(0.000)
G2	-0.404***	-0.173**	-0.175**	-0.510***
	(0.000)	(0.055)	(0.04)	(0.000)
HCI	1.147***	0.815***	0.838***	1.091***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.255***			0.255***
	(0.000)			(0.000)
K	0.151***			0.161***
	(0.000)			(0.000)
Trade	-0.197***			-0.200***
	(0.000)			(0.000)
Constant	-4.789***	-0.763***	-0.896	-5.182***
	(0.000)	(0.000)	(0.521)	(0.000)
No. of obs.	1147	1147	1147	896
No. of countries	51	51	51	51
No. of instruments				10
R-Square	0.60	0.53		0.593
F-Stat	52.733***	37.962***	137.581***	176.100***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		10.820**		
		(0.011)		
Hansen J Test				0.008
				(0.927)

Notes: The dependent variable is Environment Dimension of inclusive growth. G is government spending as a percentage of GDP whereas G2 is the square of government spending as a percentage of GDP. HCI is human capital index, IQ is institutional Quality, K is capital and Trade is trade openness. Hausman test suggests that FE is preferable and Hansen-J test suggests that instruments are valid. P-values are given in parentheses. *, **, *** are 10, 5 and 1 percent level of significance respectively.

However, the coefficient of government expenditure is positive in all models whereas the square of government expenditures is carrying a negative sign. Since the above model involves the linear and square terms of government expenditure, we take the derivative of the equation (8.1) for government expenditure to analyze the ultimate impact of government expenditures on the environment dimension and the derivatives are as follows;

$$EnD_{it} = \alpha_0 + \alpha_1 G_{it} + \alpha_2 G_{it}^2 + \alpha_3{}' Z_{it} + \text{vi} + u_{it} \qquad (8.1)$$

$$\frac{\partial EnD}{\partial G} = \alpha_1 + 2.\alpha_2 G_{it}$$

In the above equation, Z is the vector of control variables. The derivative shows that the impact of G on ED is nonlinear, and it is conditional on the levels of G. Thus, it is calculated using different levels of government expenditures, that is, the 25th, 50^{th,} and 75th percentiles.

Table 8.1b shows the impact of government expenditure on the environment dimension. The result of Pooled OLS indicates that low levels of government expenditures affect the environment positively and significantly but at a high level, the effect of government expenditure on the environmental dimension becomes insignificant. The results of FE and RE models show an insignificant impact of government expenditures on environment dimension while the FE-IV model shows a significant positive role of government expenditures on environmental inclusiveness that turn out to be insignificant at the median level of expenditures while at a higher level, government expenditures contribute to environmental inclusion negatively. This result is in line with the study of Lopez et al. (2011) that describe that there are two types of government expenditures, that is,

government spending on public goods and government spending on private goods and the latter includes subsidies given to fossil-fuel production and energy consumption, etc. and hence the higher proportion of private spending in total government expenditure contribute to the deterioration of environmental quality while an equal proportion of spending on private and public goods offset the effects of each other and leads to an insignificant impact on environmental quality.

Table 8.1b: Impact of Different Levels of Government Expenditures on Environment Dimension

G	POLS	FE	RE	FE-IV
P25=2.337	0.067***	0.009	0.0154	0.192***
	(0.000)	(0.880)	(0.799)	(0.000)
P50=2.540	0.046***	-0.044	-0.036	-0.014
	(0.011)	(0.565)	(0.625)	(0.674)
P75=2.760	0.022	-0.103	-0.093	-0.237***
	(0.361)	(0.290)	(0.326)	(0.000)

Notes: ***,**,* are 1, 5 and 10 percent level of significance respectively. P25, P50 and p75 are the 25th, 50th and 75th percentiles.

In addition to government expenditures, the role of tax revenue in promoting environmental inclusiveness is also analyzed in this study and the results are given in Table 8.2. According to results, human capital and institutional quality is observed to have a positive effect on environmental inclusiveness in all four models. However, capital and trade are found to affect the environmental dimension significantly and negatively in the case of POLS and FE-IV models. The impact of core variable tax revenue on the environmental dimension of inclusive growth is positive in all of the four models. Tax revenue collected through environmental tax causes a reduction in pollution creating activities. This result is consistent with the view of Halkos and Paizanos (2013) that stress on the issue that cut in taxes leads to carbon emission oriented consumption thus taxation can lead to a reduction in carbon emissions while Munasinghe and Cruz

(1995) are also in favor of tax policies regarding environmental quality and illustrate that right tax policy and tariff base encourages the use of production technologies that are less pollutant.

Table 8.2: Impact of Tax Revenue on Environment Dimension

Variables	POLS	FE	RE	FE-IV
TX	0.161***	0.064	0.064	0.16***
	(0.00)	(0.47)	(0.45)	(0.00)
HCI	1.244***	0.869***	0.889***	1.21***
	(0.00)	(0.00)	(0.00)	(0.00)
IQ	0.242***	0.113**	0.121***	0.26***
	(0.00)	(0.02)	(0.00)	(0.00)
K	0.117***			-0.13***
	(0.00)			(0.00)
Trade	-0.229***			-0.233***
	(0.00)			(0.00)
Constant	-2.941***	-0.678	-0.819	-2.87***
	(0.00)	(0.57)	(0.51)	(0.00)
No. of obs.	1147	1147	1147	896
No. of countries	51	51	51	51
No. of instruments				10
R-Square	0.56	0.313		0.56
F-stat	234.32	67.86	44.87	239.82
Hausman Test		7.80		
		(0.00)		
Hansen J Test				0.467
				(0.94)

Notes: As in Table 8.1a except that, TX is tax revenue. Hausman test suggests that FE is preferable.

To evaluate the role of money supply in advancing environmental inclusiveness, the impact of money supply on environment dimension is examined and the results are reported in Table 8.3. The results of all of the four estimation techniques show a positive impact on human capital and institutional quality on the environmental dimension. Results also indicate that capital formation and trade are affecting the environment negatively in the case of the FE-IV model while the POLS model shows that the impact

of capital on the environmental dimension is insignificant and trade affects the environment dimension negatively. The results of FE and RE models show an insignificant impact of money supply on the environmental dimension. The models of POLS and FE-IV show a positive and significant impact of money supply on environmental inclusiveness and this result is in accordance with the study of Moran and Queralto (2018) that emphasize that monetary policy by lowering the cost helps the firms to make innovations and help them purchase energy-efficient technologies whereas energy efficiency results in an eco-friendly environment (Riti and Shu, 2016).

Table 8.3: Impact of Money Supply on Environment Dimension

Variables	POLS	FE	RE	FE-IV
M	0.248***	0.062	0.064	0.231***
	(0.000)	(0.389)	(0.354)	(0.000)
HCI	1.137***	0.765**	0.788**	0.968***
	(0.000)	(0.040)	(0.033)	(0.000)
IQ	0.190***	0.118**	0.127***	0.340***
	(0.000)	(0.026)	(0.000)	(0.000)
K				-0.068*
				(0.080)
Trade	-0.184***			-0.13***
	(0.000)			(0.000)
Constant	-2.465***	-0.204	-0.381	-2.200***
	(0.000)	(0.112)	(0.811)	(0.000)
No. of obs.	1147	1147	1147	946
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.61	0.31		0.68
F-Stat	167.763***	8.912*	65.689***	192.360***
	(0.000)	(0.067)	(0.000)	(0.000)
Hausman Test		17.350***		
		(0.000)		
Hansen J Test				2.513
				(0.113)
Notes: As in Table 8.1a except that, M is money supply. Hausman test suggests that FE is preferable.				

After assessing the role of monetary and fiscal policy individually, to assess the interactive role of fiscal and monetary policy on environment dimension, the model given in equation 8.2 includes government expenditures and money supply along with their interactive term and the results are reported in Table 8.4a.

Table 8.4a: Interactive Impacts of Money Supply and Government Expenditures on Environment Dimension

Variables	POLS	FE	RE	FE-IV
M	-0.316	-0.242	-0.259	0.412
	(0.355)	(0.527)	(0.492)	(0.390)
G	0.472	0.736	0.676	0.780*
	(0.642)	(0.400)	(0.453)	(0.071)
G2	-0.111	-0.254	-0.241	-0.56*
	(0.624)	(0.263)	(0.291)	(0.058)
M*G	0.447	0.085	0.105	-0.111
	(0.111)	(0.782)	(0.733)	(0.798)
M*G2	-0.086	0.014	0.009	0.020
	(0.156)	(0.842)	(0.895)	(0.801)
HCI	0.998***	0.646***	0.671***	1.038***
	(0.000)	(0.010)	(0.000)	(0.000)
IQ	0.164***	0.083**	0.094***	
	(0.000)	(0.031)	(0.000)	
Trade	-0.189***			-0.200***
	(0.000)			(0.000)
Constant	-2.065*	0.381	0.249	-4.522***
	(0.080)	(0.817)	(0.874)	(0.000)
No. of obs.	1147	1147	1147	946
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.667	0.599	0.596	0.656
F-Stat	233.323***	6.659*	52.738***	187.894***
	(0.000)	(0.101)	(0.000)	(0.000)
Hausman Test		66.700		
		(0.000)		
Hansen J Test				0.315
				(0.574)

Notes: As in Table 8.1a except that, M is money supply, M*G is the interaction of money supply and government spending and M*G2 is the interaction of money supply and squared government spending. Hausman test suggests that FE is preferable.

The results in Table 8.4a indicate that human capital exerts a positive impact in promoting environment inclusiveness whereas, except the FE-IV model, the coefficient of institutional quality is positive and significant in all models. The results of the POLS and FE-IV model show that trade openness affects the environmental dimension of economic growth negatively. To analyze the impact of money supply given different levels of government expenditures and the impact of government expenditures at different levels of money supply, the derivatives of the model given in equation 8.2 for money supply and government expenditures are given as follows;

$$EnD_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 G_{it} + \beta_3 G_{it}^2 + \beta_4 M * G_{it} + \beta_5 M * G_{it}^2 + \beta_6' Z_{it} + \text{vi} + u_{it} \quad (8.2)$$

$$\frac{\partial EnD}{\partial M} = \beta_1 + \beta_4 G_{it} + \beta_5 . G^2$$

$$\frac{\partial EnD}{\partial G} = \beta_2 + \beta_3 . 2 . G_{it} + \beta_4 . M_{it} + \beta_5 2 . M * G_{it}$$

In the above equation, Z is the vector of control variables. The derivative of equation 8.2 for M shows that the impact of M on the environmental dimension is conditional on the levels of G; while the derivative for G indicates that the effect of government expenditures on the environmental dimension depends on the levels of government spending and money supply.

To examine the ultimate effect of the money supply given government spending, 25th, 50th and 75th percentiles of government expenditures have been considered. The results of FE and RE models show an insignificant impact of money supply on the environmental dimension. On the other hand, the POLS and FE-IV models show a

positive and significant effect of money supply on environment inclusiveness at all levels of government expenditures however higher levels of government expenditures reduces the effectiveness of money supply because now the role of the money supply is to correct the distortionary effects of fiscal policy measures and finance the expenditures. This result is in line with the study of Lopez (2011) that argues that a high level of government expenditures induces the scale effect and income effect that affects the environment negatively.

Table 8.4b: Impact of Money Supply Given Government Expenditures on Environment Dimension

G	POLS	FE	RE	FE-IV
P25=2.337	0.280***	0.033	0.037	0.279***
	(0.000)	(0.517)	(0.468)	(0.000)
P50=2.540	0.263***	0.064	0.068	0.278***
	(0.000)	(0.230)	(0.199)	(0.000)
P75=2.760	0.261***	0.099	0.102	0.279***
	(0.000)	(0.118)	(0.100)	(0.000)
Notes: As in Table 8.1b.				

To evaluate the impact of government expenditures given money supply on environment dimension, 25th, 50th and 75th percentile levels of the money supply are used for analysis. Table 8.4c shows the impact of government expenditures on the economic dimension given different levels of the money supply. Except for the high level of government expenditures given the low level of money supply, that affects the environment negatively, the results of FE and RE models show an insignificant impact of government expenditures on the environment.

The models of POLS and FE-IV show that a low level of government expenditures at all levels of money supply affects the environment positively whereas the impact of median level expenditure on the environment is insignificant on the other hand government

expenditure is observed to affect the environment dimension negatively at levels of the money supply. This result is in accordance with the view of Bernauer and Koubi (2006) that highlight that an increase in the size of government expenditure affects the environment negatively. The increasing proportion of government expenditures on subsidies given for fossil-fuel production and energy consumption increases carbon emission and leaves the government of developing countries with fewer funds to spend on basic facilities like access to safe drinking water and basic sanitation facilities.

Table 8.4c: Impact of Government Expenditures Given Money Supply on Environment Dimension

Money Supply	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=3.438	0.112***	0.063	0.062	0.154***
	(0.005)	(0.460)	(0.468)	(0.000)
P50=3.798	0.128***	0.117	0.116	0.152***
	(0.001)	(0.220)	(0.223)	(0.000)
P75=4.118	0.142***	0.165	0.163	0.149***
	(0.001)	(0.132)	(0.130)	(0.000)
		G=P50=2.540		
P25=3.438	-0.052	-0.020	-0.022	-0.042
	(0.154)	(0.758)	(0.742)	(0.304)
P50=3.798	-0.049	0.036	0.032	-0.041
	(0.103)	(0.592)	(0.619)	(0.179)
P75=4.118	-0.045	0.085	0.081	-0.041
	(0.145)	(0.274)	(0.286)	(0.192)
		G=P75=2.760		
P25=3.438	-0.23***	-0.111***	-0.113*	-0.254***
	(0.000)	(0.097)	(0.095)	(0.000)
P50=3.798	-0.24***	-0.053	-0.0058	-0.251***
	(0.000)	(0.369)	(0.317)	(0.000)
P75=4.118	-0.25***	-0.001	-0.007	-0.248***
	(0.000)	(0.986)	(0.912)	(0.000)
Notes: As for Table 8.1b.				

To evaluate the composite impact of money supply and tax revenue on the environment dimension, the results in Table 8.5a present an interactive role of tax revenue and money supply in promoting environmental inclusiveness. Impact of control variables human capital and institutional quality are found to affect the environment positively in all of the four models whereas the POLS and FE-IV models recognize the negative impact of trade on the environment.

Table 8.5a: Interactive Impact of Tax Revenue and Money Supply on Environment Dimension

Variables	POLS	FE	RE	FE-IV
M	0.292***	-0.005	-0.003	0.333***
	(0.000)	(0.950)	(0.978)	(0.000)
TX	0.181	-0.029	-0.029	0.234***
	(0.600)	(0.779)	(0.76)	(0.00)
TX*M	-0.023	0.024	0.024	-0.04*
	(0.355)	(0.432)	(0.425)	(0.090)
HCI	1.131***	0.745**	0.768**	1.111***
	(0.000)	(0.053)	(0.030)	(0.000)
IQ	0.147***	0.117***	0.126***	0.139***
	(0.000)	(0.010)	(0.000)	(0.000)
Trade	-0.211***			-0.211***
	(0.000)			(0.000)
Constant	-2.536***	-0.011	-0.178	-2.578***
	(0.000)	(0.998)	(0.902)	(0.000)
No. of obs.	1147	1147	1147	696
No. of countries	51	51	51	51
No. of instruments				15
R-Square	0.62	0.323		0.62
F-Stats	282.71***	5.503*	32.64***	294.35***
	(0.000)	(0.100)	(0.000)	(0.000)
Hausman Test		14.98		
		(0.013)		
Hansen J Test				1.752
				(0.185)

Notes: As in Table 8.1a except that Money is money supply, TX is tax revenue and TX*M is the interaction of Tax revenue and money supply. Hausman test suggests that FE is preferable.

To assess the impact of tax revenue and money supply derivative of the model has been taken for money supply and tax revenue.

$$EnD_{it} = \gamma_0 + \gamma_1 M_{it} + \gamma_2 TX_{it} + \gamma_3 M * TX_{it} + \gamma_4{}' Z_{it} + \text{vi} + u_{it} \quad (8.3)$$

$$\frac{\partial EnD}{\partial M} = \gamma_1 + \gamma_3 TX_{it}$$

$$\frac{\partial EnD}{\partial TX} = \gamma_2 + \gamma_3 M_{it}$$

In equation (8.3), Z is the vector of control variables. The derivative of equation (8.3) for M shows that the impact of M on EnD is conditional on the levels of tax. The derivative of EnD for TX indicates that the effect of Tax revenue on the environmental dimension depends on levels of the money supply.

To examine the ultimate effect of monetary policy given tax revenue, the 25th, 50th, and 75th percentile value of tax revenue has been used for analysis. The results of FE and RE models given in Table 8.5b show an insignificant impact of money supply on all levels of tax revenue while the models of POLS and FE-IV show that the impact of money supply on environmental inclusiveness is positive at all levels of tax revenue however the effect of money supply on environmental inclusion reduces with the increase in tax revenue. An increase in money supply by lowering interest rates helps the firms to adopt eco-friendly technologies but heavy taxation prevents firms to use energy-efficient technology.

To examine the effect of tax revenue given money supply, 25th, 50th and 75th percentile levels of money supply have been considered. Table 8.5c shows the impact of tax revenues given different levels of the money supply. The results of FE and RE models

show that the impact of tax revenue is insignificant at all levels of money supply and POLS and FE-IV models highlight a positive and significant impact of tax revenue on the environment at all levels of money supply however the effectiveness of tax revenue decreases with the increase in the level of the money supply.

Table 8.5b: Impact of Money Supply Given Different Levels of Tax Revenue on Environment Dimension

TX	POLS	FE	RE	FE-IV
P25=2.390	0.238***	0.052	0.054	0.245***
	(0.000)	(0.447)	(0.416)	(0.000)
P50=2.654	0.231***	0.059	0.06	0.234***
	(0.000)	(0.416)	(0.387)	(0.000)
P75=2.928	0.225***	0.065	0.067	0.224***
	(0.000)	(0.392)	(0.365)	(0.000)
Notes: As in Table 8.1b.				

Table 8.5c: Impact of Tax Revenue Given Different Levels of Money Supply on Environment Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.103***	0.053	0.052	0.108***
	(0.000)	(0.519)	(0.50)	(0.000)
P50=3.798	0.094***	0.061	0.061	0.094***
	(0.000)	(0.495)	(0.462)	(0.000)
P75=4.118	0.087***	0.069	0.069	0.082***
	(0.000)	(0.495)	(0.430)	(0.002)
Notes: As for Table 8.1b.				

Keeping in view the Monetarists' approach, an increase in money supply causes aggregate demand to increase that in turn raises environmental pressure through increased economic growth. However, it also causes the general price level to go up and according to Munasinghe (2019) policies, that lead to inflation causes the poorest section of the economy to live on marginal lands and thus bring about desertification and

increased fuel price forced them to consume fossil-fuel energy sources and thus affects environment adversely.

Table 8.6a shows the interaction of monetary policy and fiscal policy in the presence of financial inclusion. Results of the four models show that human capital affects the environmental dimension positively whereas according to results of POLS and FE-IV models, institutional quality affects the environment dimension of inclusive growth positively and trade openness affects the environment negatively. The control variable capital formation is found to have an insignificant impact on environment inclusiveness in all of the four models therefore capital formation has been excluded.

To analyze the impact of government expenditures, money supply, and financial inclusion, a derivative of equation 8.4 has been taken for the money supply, government expenditures, and index of financial inclusion. All of these derivates analyze the impact of one variable given the other variable. The derivatives are as follows,

$$EnD_{it} = \delta_0 + \delta_1 M_{it} + \delta_2 G_{it} + \delta_3 G_{it}^2 + \delta_4\, IFI_{it} + \delta_5 G * M_{it} + \delta_6 M * G_{it}^2 + \delta_7 IFI.M_{it} + \delta_8{}' Z_{it} + \text{vi} + u_{it} \quad (8.4)$$

$$\frac{\partial EnD}{\partial M} = \delta_1 + \delta_5 G_{it} + \delta_6 . G_{it}^2 + \delta_7 IFI_{it}$$

$$\frac{\partial EnD}{\partial G} = \delta_2 + \delta_3 2G_{it} + \delta_5 M_{it} + \delta_6 2. M * G_{it}$$

$$\frac{\partial EnD}{\partial IFI} = \delta_4 + \delta_7 M_{it}$$

In the above equation, Z is the vector of control variables. The derivative of equation 8.4 for M shows that the impact of money supply on the environmental dimension is conditional on the levels of government expenditures and financial inclusion. The derivative of equation 8.4 for G indicates that the effect of government expenditures on the environmental dimension depends on levels of government spending and money supply. While the derivative of EnD for IFI shows that the effect of financial inclusion on the environmental dimension is influenced by levels of the money supply.

To examine the ultimate effect of monetary policy 25^{th}, 50^{th}, and 75^{th} percentiles of government expenditures and financial inclusion is used. Table 8.6b presents the impact of money supply on environmental inclusiveness given different levels of government expenditures and levels of financial inclusion. The result of FE and RE models show that an increase in money supply, given the 25^{th} percentile of government expenditure and high levels of financial inclusion causes environment dimension to decrease, whereas, given the median levels of expenditures and low financial inclusion, an increase in money supply affects the environmental inclusiveness positively while the median level of expenditure and high level of financial inclusion causes the money supply to affect economic dimension negatively. On the other hand, given government expenditures at the 75^{th} percentile and financial inclusion at the 25^{th} percentile, an increase in money supply affects the environment positively, however, the level of effectiveness reduces with the increase in financial inclusion.

Table 8.6a: Interactive Impact of Money Supply, Government Expenditures and Financial Inclusion on Environment Dimension

Variables	POLS	FE	RE	FE-IV
M	0.091 (0.755)	0.009 (0.900)	0.007 (0.943)	0.692* (0.090)
G	0.571 (0.500)	0.979*** (0.00)	0.939*** (0.000)	2.41* (0.060)
G2	-0.087 (0.646)	-0.282*** (0.000)	-0.270*** (0.000)	-0.444 (0.114)
IFI	0.571*** (0.000)	0.269*** (0.000)	0.278*** (0.000)	0.632*** (0.000)
M*G	0.333 (0.177)	-0.001 (0.984)	0.014 (0.893)	-0.111 (0.724)
M*G2	-0.073 (0.155)	0.024 (0.100)	0.020 (0.181)	0.010 (0.856)
IFI*M	-0.109*** (0.000)	-0.059*** (0.000)	-0.062*** (0.000)	-0.123*** (0.000)
HCI	0.695*** (0.000)	0.607*** (0.000)	0.645*** (0.000)	0.650*** (0.000)
IQ	0.147*** (0.000)			0.09* (0.076)
Trade	-0.131*** (0.000)			-0.114*** (0.000)
Constant	-2.12** (0.038)	0.036 (0.972)	-0.172 (0.659)	-4.144*** (0.000)
R-Square	0.74	0.54	0.65	0.73
F-stat	203.844*** (0.000)	9.926** (0.030)	1336.053*** (0.000)	172.300*** (0.000)
Hausman Test		18.81 (0.00)		
Hansen J Test				0.013 (0.91)

Notes: As for Table 8.1a except that Money is money supply, IFI is the index of financial inclusion, IFI*M is the interaction of money supply and financial inclusion, M*G is the interaction of money supply and government spending and M*G2 is the interaction of money supply and squared government spending. Hausman test suggests that FE is preferable.

The models of POLS and FE-IV show that given the level of government expenditures and financial inclusion level at the 25th percentile, money supply affects the environment

dimension positively while the given the level of government expenditures, the effectiveness of money supply in improving environmental sustainability reduces with the increase in the level of financial inclusion. This result is supported by the study of Lenka & Bairwa (2016) that describes that an increase in financial inclusion mitigates the inflationary effect of monetary policy and causes an increase in aggregate demand and thus through scale effects money supply causes environment quality to deteriorate. Similarly, given the level of financial inclusion, high levels of government expenditures lessen the effectiveness of money supply because high government expenditures through scale and income effect offset the positive impact of money supply on the environment.

Table 8.6b: Impact of Money Supply Given Different Levels of Government Expenditure and Financial Inclusion on Environment Dimension

IFI	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=2.086	0.233***	0.017	0.023*	0.239***
	(0.000)	(0.236)	(0.097)	(0.000)
P50=2.718	0.164***	-0.020	-0.015	0.163***
	(0.000)	(0.150)	(0.282)	(0.000)
P75=3.205	0.111***	-0.049***	-0.045***	0.105***
	(0.000)	(0.001)	(0.003)	(0.000)
		G=P50=2.540		
P25=2.086	0.227***	0.040***	0.047	0.228***
	(0.000)	(0.003)	(0.001)	(0.000)
P50=2.718	0.158***	0.003	0.008	0.152***
	(0.000)	(0.797)	(0.566)	(0.000)
P75=3.205	0.105***	-0.025*	-0.022	0.094***
	(0.000)	(0.087)	(0.132)	(0.000)
		G=P75=2.760		
P25=2.086	0.214***	0.069***	0.074***	0.217***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=2.718	0.145***	0.031**	0.035**	0.141***
	(0.000)	(0.020)	(0.011)	(0.000)
P75=3.205	0.092***	0.003	0.005	0.083***
	(0.000)	(0.832)	(0.738)	(0.000)
Notes: As for Table 8.1b.				

Table 8.6c shows the impact of different levels of government expenditures, given the money supply. Results show that given money supply at the 25th percentile, a low level of government expenditures affect environment dimension positively while the effect of government expenditures reduces with an increase in money supply because an increase in money supply through interest rate stimulates economic activity and counterbalance the positive impact government expenditures but still the positive effect of government expenditure dominates.

Table 8.6c: Impact of Government Expenditures Given Money Supply Levels on Environment Dimension

Money Supply	POLS	FE	RE	FE-IV
		G=P25		
P25=3.438	0.121***	0.057***	0.056***	0.155***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=3.798	0.117***	0.098***	0.095***	0.134***
	(0.000)	(0.000)	(0.000)	(0.001)
P75=4.118	0.113***	0.134***	0.131***	0.115***
	(0.000)	(0.000)	(0.000)	(0.007)
		G=P50		
P25=3.438	-0.016***	-0.022	-0.025	-0.006
	(0.000)	(0.188)	(0.148)	(0.853)
P50=3.798	-0.031***	0.022	0.018	-0.025
	(0.000)	(0.205)	(0.311)	(0.354)
P75=4.118	-0.045***	0.061***	0.056***	-0.042
	(0.000)	(0.002)	(0.005)	(0.144)
		G=P75		
P25=3.438	-0.165***	-0.108***	0.112***	-0.181***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=3.798	-0.191***	-0.060***	-0.066***	-0.191***
	(0.000)	(0.004)	(0.002)	(0.000)
P75=4.118	-0.216***	-0.017	-0.025	-0.213***
	(0.000)	(0.459)	(0.291)	(0.000)
Notes: As for Table 8.1b.				

The result of the POLS model in Table 8.6c shows that setting government expenditures at the median level affects the environment negatively, whereas results of FE and RE

models show that the median level of government expenditures accompanied by high levels of money supply affect the environment positively. The model of FE-IV shows that the median level of government expenditures has an insignificant impact on the environment. Results show that high levels of government expenditure, through scale and income effect as highlighted by Lopez et al. (2011), affect environmental inclusiveness negatively at all levels of the money supply.

The result in Table 8.6d describes the effect of financial inclusion on the environment dimension, given different levels of the money supply. Given the money supply at the 25th percentile, an increase in financial inclusion affects environment inclusion positively but high levels of money supply decrease the effectiveness of financial inclusion on the environment. This result is supported by Kumar et al. (2005) that examine that financial inclusion causes an increase in welfare and raises the productivity of both producer and consumer.

Table 8.6d: Impact of Financial Inclusion Given Money Supply Levels on Environment Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.194***	0.066**	0.067***	0.216***
	(0.000)	(0.013)	(0.000)	(0.000)
P50=3.798	0.155***	0.045*	0.045***	0.173***
	(0.000)	(0.072)	(0.000)	(0.000)
P75=4.118	0.120***	0.026	0.026***	0.134***
	(0.000)	(0.314)	(0.009)	(0.000)
Notes: As for Table 8.1b.				

Keeping in view Environment Kuznets Curve, Maradan (2005) explains that with the increase in welfare, people value the quality of the environment more than other consumption items. However, an increase in the level of money supply, by increasing the

aggregate demand, counter affects the role of financial inclusion, yet the effect of financial inclusion dominates. Thus, increasing access to financial instruments given a low level of the money supply is more effective to improve the environmental dimension of inclusive growth.

After analyzing the composite impact of money supply, government expenditures, and financial inclusion on the environmental dimension, the results given in Table 8.7a presents the composite impact of money supply, tax revenue, and financial inclusion on the environmental dimension of inclusive growth. Human capital is found to affect the environment positively whereas except in the RE model, the coefficient of institutional quality is positive in the rest of the models. The results of POLS, RE, and FE-IV models show a negative impact of trade on environmental quality.

To analyze the interactive role of money supply, tax revenue, and financial inclusion, the following derivatives have been calculated.

$$EnD_{it} = \emptyset_0 + \emptyset_1 M_{it} + \emptyset_2 TX_{it} + \emptyset_3\, IFI_{it} + \emptyset_4 M * TX_{it} + \emptyset_5 IFI * M_{it} + \emptyset_6{}' Z_{it} + \text{vi} + u_{it} \quad (8.5)$$

$$\frac{\partial EnD}{\partial M} = \emptyset_1 + \emptyset_4 TX_{it} + \emptyset_5 IFI_{it}$$

$$\frac{\partial EnD}{\partial TX} = \emptyset_2 + \emptyset_4 M_{it}$$

$$\frac{\partial EnD}{\partial IFI} = \emptyset_3 + \emptyset_5 M_{it}$$

In equation (8.5), Z is the vector of control variables. The derivative of EnD for M shows that the impact of Money supply on the environmental dimension is conditional on the levels of tax revenue and financial inclusion. The derivative of equation (8.5) with respect to TX indicates that the effect of tax revenue on the environmental dimension depends on levels of the money supply. The derivative of EnD with respect to IFI shows that the impact of financial inclusion on the environmental dimension is conditional on levels of the money supply. To examine the ultimate effect of these policies the 25^{th}, 50^{th}, and 75^{th} percentile levels of money supply, tax revenue, and financial inclusion are calculated.

The result in Table 8.7b explains the impact of money supply on the environmental dimension given different levels of money supply and level of financial inclusion. The models of FE and RE show an insignificant impact of money supply on the environmental dimension at all levels of tax revenue and financial inclusion. According to the model of POLS, an increase in money supply, given financial inclusion and tax revenue at the 25^{th} percentile, affect the environment positively. The impact of the money supply is also positive at the 25^{th} percentile of financial inclusion and the median level of tax revenue. The result of the FE-IV model indicates that in the presence of low levels of financial inclusion and tax revenue, money supply tends to affect the environment positively, on the contrary, given high levels of financial inclusion and tax revenue, an increase in money supply affects the environment dimension negatively.

Table 8.7a: Interactive Role of Money Supply, Tax Revenue and Financial Inclusion in Promoting Environmental Inclusiveness

Variables	POLS	FE	RE	FE-IV
M	0.558***	0.158**	0.166***	0.640***
	(0.000)	(0.032)	(0.008)	(0.000)
TX	0.272***	0.078	0.077	0.361***
	(0.000)	(0.424)	(0.443)	(0.000)
IFI	0.593***	0.291***	0.299***	0.655***
	(0.000)	(0.000)	(0.000)	(0.000)
M*TX	-0.049**	-0.003	-0.002	-0.070***
	(0.027)	(0.898)	(0.913)	(0.000)
IFI*M	-0.112***	-0.061***	-0.064***	-0.123***
	(0.000)	(0.009)	(0.000)	(0.000)
HCI	0.774***	0.685*	0.714**	0.732***
	(0.000)	(0.064)	(0.040)	(0.000)
IQ	0.131***	0.083**		0.111***
	(0.000)	(0.023)		(0.000)
Trade	-0.139***		-0.095***	-0.130***
	(0.000)		(0.000)	(0.000)
Constant	-2.248***	-0.301	-0.535	-2.300***
	(0.000)	(0.888)	(0.784)	(0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.700	0.455	0.635	0.711
F-stat	231.622***	9.534**	76.000***	233.68***
	(0.000)	(0.014)	(0.000)	(0.000)
Hausman Test		29.54		
		(0.000)		
Hansen J Test				0.521
				(0.477)

Notes: As for Table 8.1a except that M is money supply, TX is the tax revenue, IFI is the index of financial inclusion, TX*M is the interaction of money supply and tax revenue and IFI*M is the interaction of financial inclusion and money supply. Hausman test suggests that FE is preferable.

Table 8.7b: Impact of Money Supply Given Tax Revenue and Financial Inclusion Levels on Environment Dimension

IFI	POLS	FE	RE	FE-IV
Tax= P25=2.390				
P25=2.086	0.056**	-0.059	-0.058	0.053**
	(0.018)	(0.451)	(0.447)	(0.033)
P50=2.718	0.016	-0.081	-0.081	0.009
	(0.598)	(0.337)	(0.327)	(0.782)
P75=3.205	-0.019	-0.101	-0.101	-0.030
	(0.589)	(0.265)	(0.252)	(0.434)
Tax= P50=2.654				
P25=2.086	0.043*	-0.060	-0.059	0.033
	(0.068)	(0.457)	(0.455)	(0.166)
P50=2.718	0.003	-0.082	-0.082	-0.010
	(0.919)	(0.344)	(0.336)	(0.737)
P75=3.205	-0.033	-0.101	-0.102	-0.049
	(0.359)	(0.271)	(0.260)	(0.184)
Tax= P75=2.928				
P25=2.086	0.030	-0.061	-0.059	0.013
	(0.235)	(0.466)	(0.466)	(0.589)
P50=2.718	-0.010	-0.083	-0.080	-0.030
	(0.730)	(0.353)	(0.346)	(0.327)
P75=3.205	-0.046	-0.102	-0.103	-0.69*
	(0.197)	(0.280)	(0.269)	(0.059)
Notes: As for table 8.1b.				

Table 8.7c shows the impact of tax revenue on the environment dimension. Results of FE and RE models indicate an insignificant impact of tax revenue in improving environmental inclusiveness. On the other hand, the models of POLS and FE-IV show that an increase in tax revenue, given the 25th percentile level of money supply, affects the environment dimension positively whereas the effectiveness of tax revenue decreases with an increase in the money supply. The high levels of the money supply, by increasing inflation, force many individuals to rely on traditional sources of energy, which is deforestation and consumption of fossil fuels and affect the environment negatively.

Table 8.7c: Impact of Tax Revenue Given Money Supply Levels on Environment Dimension

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.103***	0.068	0.069	0.112***
	(0.000)	(0.259)	(0.242)	(0.000)
P50=3.798	0.085***	0.067	0.068	0.086***
	(0.000)	(0.270)	(0.247)	(0.000)
P75=4.118	0.069***	0.067	0.067	0.063***
	(0.000)	(0.286)	(0.260)	(0.000)
Notes: As for Table 8.1b.				

Table 8.7d describes the impact of financial inclusion on environmental inclusion. According to results, given the money supply at the 25th percentile, an increase in the level of financial inclusion causes environmental inclusion to increase however high levels of money supply trim down the effectiveness of financial inclusion because the inclusiveness of finance increases the interest rate elasticity of aggregate demand and this result is consistent with the study of Mbutor and Uba (2013), thus an increase in money supply through interest rate channel affects aggregate demand and spurs economic activities harming the environment.

Table 8.7d: Impact of Financial Inclusion Given Money Supply Levels on Environment Level

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.209***	0.088***	0.080***	0.231***
	(0.000)	(0.006)	(0.003)	(0.000)
P50=3.798	0.168***	0.058**	0.058**	0.187***
	(0.000)	(0.015)	(0.013)	(0.000)
P75=4.118	0.133***	0.038*	0.037*	0.148***
	(0.000)	(0.090)	(0.088)	(0.000)
Notes: As for table 8.1b.				

Overall, the results in this chapter indicate that higher levels of expenditures affect environment inclusion negatively. Money supply affects the environmental dimension of inclusive growth positively but at higher levels of government expenditures, the effectiveness of money supply decreases because now the role of the money supply is to correct the distortionary effects of fiscal policy measures and finance the expenditures. On the other hand, financial inclusion at low levels of money supply affects environment inclusion positively while at higher money supply, due to scale effects, environmental quality deteriorates.

CHAPTER 9

RESULTS AND DISCUSSION: AGGREGATE INCLUSIVE GROWTH

The role of macroeconomic policies and financial inclusion on economic, social, and environmental dimensions of inclusive growth is discussed in detail in chapters 6, 7, and 8 respectively while this chapter serves to analyze the impact of macroeconomic policies and financial inclusion on an aggregated index of inclusive growth. There are seven models in this chapter. In the first three models, we have analyzed the impact of the fiscal and monetary policy separately while the rest of the models serves to explore the interactive role of macroeconomic policies and financial inclusion on inclusive growth. The control variables are human capital, institutional quality, gross capital formation, and trade whereas the general to specific approach has been used to reach the correct model. To investigate the role of fiscal policy, government expenditures and tax revenues have been used whereas for monetary policy money supply is used.

An appropriate redistributive policy can boost up the growth per-capita output and improves living standard (Bassanini et al., 2001) and leads to inclusive growth whereas fiscal policy fails to achieve inclusive growth in countries where the focus of the policies is to achieve high economic growth only (Estrada et al., 2014). To analyze the role of fiscal policy in enhancing inclusive growth in developing countries, we have first examined the impact of government expenditure on the inclusive growth index and results are given in Table 9.1a. To analyze the impact of government spending, followed by Tanninen (1999) who believes a nonlinear impact of government expenditures on economic growth, square of government expenditures has been included in the model.

The non-linear relationship between government spending and inclusive growth has been confirmed through graphical analysis given in Figure 5.13 of chapter 5.

The results indicate that the control variables, human capital, institutional quality, and capital formation affect inclusive growth positively and significantly whereas the results from POLS and FE-IV models show that the impact of trade on inclusive growth is negative. These results are in accordance with the literature. Investment in the capital is the basic factor to achieve high economic growth and employment. Institutional quality also contributes to inclusive growth and by controlling corruption and high-quality government regulations, makes sure the benefits of growth reach the deserved ones. Trade openness is found to affect inclusive growth negatively because, in developing countries, the value of imported goods exceeds the value of exported items. On the other hand, the greater tendency of people in these countries towards using imported goods hurts local industries that result in a decrease in output and employment opportunities. Regarding human capital, many studies have recognized its role in promoting economic growth (Barro, 2001). Safdari et al. (2010) are of the view that human capital affects the absorption capability of technological innovations and thus increases growth, while according to Ho and Tan (2008), human capital by the increasing capability of the workforce reduces unemployment. Mandlebe (2014) finds a positive link between human capital and inclusive growth because it affects economic growth and welfare positively.

In equation 9.1, Z is the vector of control variables. The derivative shows that the impact of G on IGI is nonlinear, and it is conditional on the levels of G. Thus, it is calculated using different levels of government expenditures, that is, the 25^{th}, 50^{th}, and 75^{th} percentiles.

$$IGI_{it} = \alpha_0 + \alpha_1 G_{it} + \alpha_2 G_{it}^2 + \alpha_3 Z'_{it} + \text{vi} + u_{it} \quad (9.1)$$

$$\frac{\partial IGI}{\partial G} = \alpha_1 + 2\alpha_2 G_{it}$$

Table 9.1a: Impact of Government Expenditures on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
G	1.180***	0.733***	0.728***	1.521***
	(0.000)	(0.010)	(0.011)	(0.000)
G2	-0.222***	-0.15**	-0.15**	-0.280***
	(0.000)	(0.022)	(0.023)	(0.000)
HCI	1.472***	1.691***	1.687***	1.421***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.317***	0.099*	0.104**	0.333***
	(0.000)	(0.074)	(0.024)	(0.000)
K	0.202***	0.126***	0.125***	0.22***
	(0.000)	(0.000)	(0.000)	(0.000)
Trade	-0.194***			-0.19***
	(0.000)			(0.000)
Constant	-5.466***	-5.512***	-5.5168***	-5.73***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	946
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.703	0.68	0.65	0.70
F-Stat	515.364***	27.511***	148.979***	456.05***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		6.67		
		(0.25)		
Hansen J Test				1.291
				(0.255)

Notes: The dependent variable is index of inclusive growth (IGI). G is government spending whereas G2 is the square of government spending. The control variables are discussed in section. *Hausman* test suggests that RE is preferable and Hansen-J test suggests that instruments are valid. P-values are given in parentheses. *, **, *** are 10, 5 and 1 percent level of significance respectively.

The results in Table 9.1b show the impact of different levels of government expenditures on inclusive growth. Results of FE and RE models show an insignificant impact of government spending on inclusive growth. The POLS and FE-IV models show that government expenditures at the 25th percentile and median level affect inclusive growth

positively and significantly however high level of government has a negative but insignificant impact on inclusive growth. Comparing these results with Table 6.1b, 7.1b and 8.1b, we observe a trade-off between dimensions of inclusive growth. The Median level of government spending affects the economic dimension positively whereas it affects the environment dimension negatively; however, its impact on the aggregate index of inclusive growth is positive that leads to the conclusion that the positive impact of median level government spending on the economic dimension dominates its negative effect on environment dimension. On the other hand, a higher level of government spending affects both economic and environmental dimensions negatively therefore its impact on the aggregated index is also negative.

Our result is consistent with the studies in the literature. According to Dritsakis and Adamopoulus (2004), government spending accelerates economic growth and causes a reduction in the rate of unemployment and helps to shrink the poverty level in the economy, however high levels of government expenditures do not promote inclusive growth because, at low levels of government spending, the growth effects dominate the distortionary effects of tax collections that are used to finance expenditures whereas at high levels of expenditures distortionary effect of taxes dominates (Alesina and Rodrick, 1994). Barro (1990) argues that a high level of government spending results in a decline in economic activities because developing countries heavily rely on taxes, internal, and external debt for financing these expenditures that, in the long run, hit output and employment negatively. Consequently, high government spending affects inclusive growth negatively.

Table 9.1b: Impact of Different Levels of Government Expenditures on Inclusive Growth

G	POLS	FE	RE	FE-IV
P25=2.337	0.155***	0.026	0.029	0.188***
	(0.000)	(0.681)	(0.647)	(0.000)
P50=2.540	0.066***	-0.034	-0.031	0.072***
	(0.008)	(0.658)	(0.681)	(0.007)
P75=2.760	-0.030	0.100	-0.097	-0.053
	(0.341)	(0.301)	(0.311)	(0.123)
Notes: ***,**,* are 1, 5 and 10 percent level of significance respectively. P25, P50 and p75 are the 25th, 50th and 75th percentiles.				

In addition to government expenditures, we have also analyzed the impact of tax revenue on inclusive growth and the results are given in Table 9.2. Human capital, institutional quality, and capital formation are observed to have a positive and significant impact on inclusive growth whereas the POLS and FE-IV models show a negative impact of trade on the inclusiveness of growth. The models of FE and RE show an insignificant impact of tax revenue on inclusive growth whereas the POLS and FE-IV models confirm a positive and significant impact of tax revenue on inclusive growth. Tax revenues by financing government expenditures help to increase economic growth while at the same time taxes are used to correct the distribution of income. This result is supported by the study of Ojong et al. (2016) who observe that countries with a higher tendency of tax evasion lead to less revenue to finance government spending and therefore reduce economic activities. Thus, an efficient tax system can raise inclusive growth.

Table 9.2: Impact of Tax Revenue on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
TX	0.174***	0.037	0.038	0.172***
	(0.000)	(0.643)	(0.622)	(0.009)
HCI	1.518***	1.728***	1.723***	1.480***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.288***	0.138**	0.141***	0.310***
	(0.000)	(0.022)	(0.000)	(0.008)
K	0.185***	0.111**	0.112**	0.210***
	(0.000)	(0.036)	(0.033)	(0.000)
Trade	-0.225***			-0.222***
	(0.000)			(0.000)
Constant	-4.304***	-5.082***	-5.077***	-4.288***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	897
No. of countries	51	51	51	51
No. of instruments				14
R-Square	0.70	0.65	0.65	0.69
F-stat	628.970***	28.559***	125.055***	596.667***
	(0. 000)	(0.000)	(0.000)	(0.000)
Hausman Test		3.412		
		(0.490)		
Hansen J Test				0.649
				(0.462)

Notes: As for Table 9.1a except that, TX is the tax revenue. Hausman test suggests that RE is preferable.

The fiscal policy variables in Table 9.1a and 9.2 are found to affect inclusive growth significantly while to examine the impact of monetary policy, the impact of money supply on inclusive growth has been analyzed and the results are reported in Table 9.3. The impact of control variables human capital, institutional quality, and capital formation is positive and significant in all models whereas the models of POLS and FE-IV only show a negative and significant impact of trade on inclusive growth. The results show that the money supply plays a positive and significant role in promoting inclusive growth. This result is supported by the studies in the literature. Goshit (2015) confirms a

significant impact of money supply on inclusive growth while Mohan and Patra (2009) argue that an increase in money supply through the transmission channel of interest rate causes an increase in the level of consumption and investment whereas through the exchange rate channel (Chang and Jaffar, 2014) money supply affects exports and aggregate demand.

Table 9.3: Impact of Money Supply on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
M	0.263***	0.138**	0.142***	0.236***
	(0.000)	(0.028)	(0.015)	(0.000)
HCI	1.407***	1.452***	1.450***	1.252***
	(0.006)	(0.000)	(0.000)	(0.000)
IQ	0.242***	0.131***	0.135***	0.390***
	(0.000)	(0.009)	(0.000)	(0.000)
K	0.047***	0.095*	0.094*	0.111**
	(0.000)	(0.089)	(0.079)	(0.048)
Trade	-0.175***			-0.132***
	(0.000)			(0.000)
Constant	-3.787***	-3.941***	-3.958***	-3.910***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	1096
No. of countries	51	51	51	51
No. of instruments				9
R-Square	0.74	0.67	0.71	0.76
F-stat	85.154***	36.070***	152.962***	734.711***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		4.978		
		(0.289)		
Hansen J Test				2.681
				(0.105)
Notes: As in Table 9.1a except that, M is money supply.				

On the other hand, an increase in money supply through the channel of asset price (Ebson & Ikhide, 2002) leads to an increase in the value of the future price of bonds and stocks and thus leads to a rise in aggregate demand whereas through the credit channel bring about a boost in consumption and investment (Moreno, 2008). An increase in aggregate

demand through these four mechanisms causes output and employment to increase while Romer and Romer (1998) are of the view that an increase in the supply of money creates a cyclical boom and helps to stabilize the growth of aggregate demand that in turn improves the well being of the poor section of the economy.

Understanding the relationship between monetary and fiscal policy helps policymakers to sort out any imbalances in the economy (Musa et al., 2014). To explore the interactive role of monetary and fiscal policy in enhancing inclusive growth, the model in equation 9.2 includes money supply, government expenditures, and their interactive term. The results in Table 9.4a show the impact of government expenditures and money supply on inclusive growth. Results in this table also highlight a positive and significant role of control variables human capital, institutional quality, and capital formation however the results of POLS and FE-IV models show a negative and significant impact of trade on inclusive growth whereas the models of FE and RE show that trade openness does not affect inclusive growth significantly. A detailed discussion on the effect of control variables on inclusive growth has been given earlier under the discussion of Table 9.1a.

To analyze the impact of government spending and money supply derivative of the model has been taken for money supply and government expenditures and the derivatives are as follows;

$$IGI_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 G_{it} + \beta_3 G_{it}^2 + \beta_4 M * G_{it} + \beta_5 M * G_{it}^2 + \beta_6{}' Z_{it} + \text{vi} + +u_{it} \quad (9.2)$$

$$\frac{\partial IGI}{\partial M} = \beta_1 + \beta_4 G_{it} + \beta_5 G^2$$

$$\frac{\partial IGI}{\partial G} = \beta_2 + \beta_3 2G_{it} + \beta_4 M_{it} + \beta_5 2\, M * G_{it}$$

In equation (9.2), Z is the vector of control variables while the derivative of IGI for M shows that the impact of money supply on inclusive growth is influenced by levels of government expenditures. The derivative of equation (9.2) for G shows that the effect of government expenditures on inclusive growth is conditional on levels of money supply and government spending.

To assess the impact of money supply, 25th, 50th and 75th percentiles of Government expenditures have been used. The Results in Table 9.4b analyze the impact of money supply given different levels of government expenditures. All of the models show a positive and significant impact of an increase in money supply on inclusive growth at different levels of government expenditures. Our results is consistent with the study of Ogunmuyiwa and Ekone (2010) that conclude that money supply positively affects economic development and growth. However, the effectiveness of the money supply in promoting inclusive growth decreases with the increase in the level of government expenditures. Hilbers (2004) explains that fiscal policy through seigniorage limits the role of money supply because a high level of government expenditure that affects aggregate demand and social welfare can be financed through the printing of money.

Table 9.4a: Interactive Impact of Government Expenditures and Money Supply on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
M	0.041 (0.867)	-0.114 (0.622)	-0.122 (0.597)	0.607 (0.105)
G	0.931 (0.200)	0.759 (0.279)	0.724 (0.361)	2.687*** (0.008)
G2	-0.237 (0.134)	-0.266 (0.177)	-0.258 (0.188)	-0.58** (0.013)
M*G	0.086 (0.677)	0.045 (0.813)	0.055 (0.800)	-0.351 (0.249)
M*G2	-0.001 (0.999)	0.022 (0.667)	0.019 (0.700)	0.086 (0.178)
HCI	1.312*** (0.000)	1.361*** (0.000)	1.362*** (0.000)	1.291*** (0.000)
IQ	0.211*** (0.000)	0.092** (0.048)	0.098** (0.038)	0.187*** (0.000)
K	0.087*** (0.000)	0.107*** (0.008)	0.106*** (0.000)	0.068* (0.099)
Trade	-0.183*** (0.000)			-0.183*** (0.000)
Constant	-4.022*** (0.000)	-3.509*** (0.000)	-3.502*** (0.000)	-5.981*** (0.000)
No. of obs.	1147	1147	1147	897
No. of countries	51	51	51	51
No. of instruments				13
R-Square	0.76	0.73	0.71	0.75
F-stat	477.085*** (0.000)	40.056*** (0.000)	334.366*** (0.000)	408.578*** (0.000)
Hausman Test		13.825 (0.087)		
Hansen J Test				1.856 (0.173)

Notes: As for Table 9.1a except that, M is money supply, M*G is the interaction money supply and government spending and M*G2 is the interaction of money supply and squared government expenditure. Hausman test suggests that FE is preferable.

Table 9.4b: Impact of Money Supply Given Government Expenditures Levels on Inclusive Growth

G	POLS	FE	RE	FE-IV
P25=2.337	0.268***	0.108***	0.112***	0.282***
	(0.000)	(0.008)	(0.005)	(0.000)
P50=2.540	0.255***	0.130***	0.142***	0.255***
	(0.000)	(0.001)	(0.001)	(0.000)
P75=2.760	0.243***	0.174***	0.177***	0.247***
	(0.000)	(0.001)	(0.000)	(0.000)
Notes: As for Table 9.1b.				

The models of FE and RE in Table 9.4c show an insignificant impact of government expenditures at all levels of the money supply. According to the results of POLS and FE-IV models, government expenditures at the 25th percentile affect inclusive growth positively and the effectiveness of government expenditures increases with the increase in the money supply. Government expenditures at the median also exert a positive impact on inclusiveness and the effectiveness of the median level of expenditures increases at higher levels of the money supply. However, the impact of the 75th percentile level of government spending affects inclusive growth negatively the high levels of money supply reduces the negative effects of high expenditures.

As mentioned by Alesina and Rodrick (1994), low levels of government expenditures result in acceleration of economic growth as compared to high expenditures, the increase in money supply causes a rise in aggregate demand and affects the income, employment, and human welfare. As discussed earlier in the previous chapter, in developing countries due to heavy reliance on taxes and debts to finance government expenditures, high expenditures affect the economic dimension negatively whereas due to the scale effect, high government spending adversely affects the environment dimension. Thus, the

impact of higher levels of government expenditures on the overall index of inclusive growth is negative. Dollar and Kraay (2002) suggest that an increase in overall government expenditures has an insignificant impact on education and health thus it affects the opportunities to participate in the growth process. Consequently, according to results, a low level of government spending given a high level of money supply proves to be an effective policy to promote inclusive growth.

Table 9.4c: Impact of Government Expenditures Given Money Supply Levels on Inclusive Growth

Money Supply	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=3.438	0.110***	0.018	0.020	0.128***
	(0.000)	(0.786)	(0.763)	(0.000)
P50=3.798	0.140***	0.071	0.073	0.144***
	(0.000)	(0.291)	(0.274)	(0.000)
P75=4.118	0.166***	0.118	0.119*	0.159***
	(0.000)	(0.101)	(0.095)	(0.000)
		G=P50=2.540		
P25=3.438	0.013	-0.050	-0.057	0.012
	(0.619)	(0.430)	(0.441)	(0.678)
P50=3.798	0.043**	-0.003	-0.002	0.041*
	(0.037)	(0.958)	(0.976)	(0.061)
P75=4.118	0.069***	0.046	0.047	0.067***
	(0.001)	(0.476)	(0.455)	(0.001)
		G=P75=2.760		
P25=3.438	-0.091***	-0.143	0.141	-0.113***
	(0.005)	(0.116)	(0.118)	(0.003)
P50=3.798	-0.062**	-0.084	-0.083	-0.071*
	(0.013)	(0.260)	(0.257)	(0.080)
P75=4.118	-0.036	-0.031	-0.03	-0.330
	(0.166)	(0.657)	(0.652)	(0.229)
Notes: As for Table 9.1b.				

In order to assess the interactive impact of money supply and tax revenue on inclusive growth, the model given in equation (9.3) includes money supply, tax revenue, and their interactive term and the results are reported in Table 9.5a. Results show that the control

variables human capital, institutional quality, and capital formation is affecting inclusive growth positively and trade openness affects inclusive growth negatively. The derivatives of the model for money supply and tax revenue are as follows;

$$IGI_{it} = \gamma_0 + \gamma_1 M_{it} + \gamma_2 TX_{it} + \gamma_3 M * TX_{it} + \gamma_4{}' Z_{it} + \text{vi} + u_{it} \quad (9.3)$$

$$\frac{\partial IGI}{\partial M} = \gamma_1 + \gamma_3 TX_{it}$$

$$\frac{\partial IGI}{\partial TX} = \gamma_2 + \gamma_3 M_{it}$$

In equation (9.3), Z is the vector of control variables while the derivative of IGI for M shows that the impact of money supply on inclusive growth is influenced by levels of tax revenue. The derivative of equation (9.3) with respect to TX shows that the effect of tax revenue on inclusive growth is conditional on levels of the money supply.

To examine the impact of money supply given different levels of tax revenues, 25th percentile, median, and 75th percentile level of tax revenue have been considered and the results are given in Table 9.5b. Results show that at the lowest level of tax revenue, an increase in money supply through an increase in aggregate demand levels up output and employment and thus, affect inclusive growth positively while the level of effectiveness increases with the increase in tax revenue. On one hand, an increase in the money supply by declining the rate of interest causes future stock prices to increase and it causes the income of the investor class to go up. On the other hand, a decline in the interest rate causes a decline in deposit interest rate also and lower and middle classes who keep their money in bank deposits do not get the benefit. Thus, an increase in the money supply leads to widening the income gap between rich and poor (Taghizadeh-Hesary et al.,

2018). While a high tax rate by correcting inequality in income reduces the negative effect of money supply and the mix of these two leads to improvement in inclusive growth. Taken as a whole, results suggest a high money supply given high tax revenue to be an effective policy to improve inclusive growth.

Table 9.5a: Interactive Impact of Tax Revenue and Money Supply on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
M	0.196***	0.121*	0.123*	0.221***
	(0.000)	(0.081)	(0.064)	(0.000)
TX	0.038	-0.002	-0.001	0.071
	(0.577)	(0.988)	(0.997)	(0.421)
TX*M	0.02	0.010	0.011	0.011
	(0.255)	(0.729)	(0.687)	(0.576)
HCI	1.391***	1.462***	1.458***	1.361***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.201***	0.136**	0.142***	0.211***
	(0.000)	(0.028)	(0.007)	(0.000)
K	0.064**	0.104**	0.104	0.07**
	(0.022)	(0.047)	(0.365)	(0.032)
Trade	-0.209***	-0.078*	-0.084**	-0.212***
	(0.000)	(0.089)	(0.049)	(0.000)
Constant	-3.483***	-3.743***	-3.741***	-3.486***
	(0.000)	(0.000)	(0.000)	(0.000)
No. of obs.	1147	1147	1147	740
No. of countries	51	51	51	51
No. of instruments				23
R-Square	0.745	0.733	0.725	0.75
F-stat	642.811***	23.242***	137.899***	648.200***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		5.41		
		(0.609)		
Hansen J Test				2.327
				(0.127)
Notes: As for Table 9.1a except that M is money supply, TX is tax revenue and TX*M is the interaction of tax revenue and money supply.				

Table 9.5b: Impact of Money Supply Given Tax Revenue Levels on Inclusive Growth

TX	POLS	FE	RE	FE-IV
P25=2.390	0.242***	0.145***	0.149***	0.245***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=2.654	0.247***	0.148**	0.152***	0.249***
	(0.000)	(0.013)	(0.000)	(0.000)
P75=2.928	0.253***	0.151**	0.155**	0.252***
	(0.000)	(0.018)	(0.033)	(0.000)
Notes: As for Table 9.1b.				

To analyze the impact of tax revenue, conditional on money supply levels, on inclusive growth, 25th, 50th, and 75th percentiles of money supply have been considered. The FE and RE models in Table 9.5c show an insignificant impact of tax revenue on inclusive growth at all levels of money supply; however, the POLS and FE-IV models show that tax revenue affects inclusive growth positively and an increase in money supply causes the effectiveness of tax revenue to increase.

Table 9.5c: Impact of Tax Revenue Given Money Supply Levels on Inclusive Growth

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.105***	0.032	0.036	0.108***
	(0.000)	(0.635)	(0.592)	(0.000)
P50=3.798	0.112***	0.036	0.040	0.112***
	(0.000)	(0.614)	(0.568)	(0.000)
P75=4.118	0.118***	0.040	0.043	0.116***
	(0.000)	(0.602)	(0.554)	(0.000)
Notes: As for Table 9.1b.				

Our result is supported by the study of Lutfunnahar (2007) who confirms that money supply is one of the factors that affect tax revenue, and in developing countries with a narrow tax base, the resulting budget deficits are financed through printing money. An increase in money supply by lowering the interest rate also supports entrepreneurs and thus raises the level of economic activities in the country. While revenue from

environmental tax improves environmental sustainability. Thus, the overall effect of tax revenue on inclusive growth is positive.

Since along with fiscal actions, monetary policy also depends on the level of financial inclusion, to evaluate the interactive role of fiscal policy, monetary policy and financial inclusion model given in equation (9.4) have been formulated. Table 9.6a serves to highlight the role of macroeconomic policies and financial inclusion on inclusive growth. Results show a positive impact of human capital, institutional quality, and capital formation on inclusive growth however, the models of POLS and FE-IV show a negative and significant impact of trade on inclusive growth. To investigate the interactive role of macroeconomic policies and financial inclusion, the following derivates have been taken.

$$IGI_{it} = \delta_0 + \delta_1 M_{it} + \delta_2 G_{it} + \delta_3 G_{it}^2 + \delta_4 IFI_{it} + \delta_5 M * G_{it} + \delta_6 M * G_{it}^2 + \delta_7 IFI * M_{it} + \delta_8{}' Z_{it} + \text{vi} + u_{it} \quad (9.4)$$

$$\frac{\partial IGI}{\partial M} = \delta_1 + \delta_5 G_{it} + \delta_6 . G_{it}^2 + \delta_7 IFI_{it}$$

$$\frac{\partial IGI}{\partial G} = \delta_2 + \delta_3 . 2G_{it} + \delta_5 M_{it} + \delta_6 M * G_{it}$$

$$\frac{\partial IGI}{\partial IFI} = \delta_4 + \delta_7 M_{it}$$

In equation (9.4), Z is the vector of control variables while the derivative of IGI with respect to M shows that the impact of money supply on inclusive growth is influenced by levels of government expenditures and financial inclusion. The derivative of equation (9.4) with respect to G shows that the effect of government expenditures on inclusive growth is conditional on levels of money supply and government spending. The

derivative of equation (9.4) with respect to IFI indicates that the relationship between financial inclusion and inclusive growth is influenced by the level of the money supply.

To examine the impact of money supply given government spending and financial inclusion, 25th, 50th, and 75th percentile levels of government expenditures and financial inclusion are used for analysis. The results in Table 9.6b show that given financial inclusion at the 25th percentile, money supply at a low level of government expenditures affects inclusive growth positively, however, the effectiveness decreases at higher levels of financial inclusion. At low levels of financial inclusion, money supply through interest rate and credit supply channel boosts up aggregate demand and thus economic growth while high levels of financial inclusion cause an increase in income inequality in developing countries due to moral hazards and asymmetric information and this result is in accordance with the study of Tita and Aziakpono (2017).

On the other hand, Bucci and Marsiglio (2019) are of the view that financial growth, through physical capital accumulation more than human capital accumulation, affects human welfare negatively. Evans (2016) finds that financial inclusion does not improve the effectiveness of monetary policy in Africa. While money supply given the low level of expenditures affects inclusive growth more relative to government expenditures at 75th and median level. High levels of government expenditures, through welfare benefits, can reduce the incentive to work whereas, in countries with high debt, an increase in government spending causes the cost of borrowing to increase. The high cost of borrowing discourages many investors including women entrepreneurs to invest. Thus, high government expenditures in developing countries reduce the effectiveness of the money supply in enhancing inclusive growth.

Table 9.6a: Interactive Impact of Money supply, Government expenditures and Financial Inclusion on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
M	0.255 (0.222)	-0.059 (0.812)	-0.070 (0.777)	0.89*** (0.000)
G	1.065 (0.086)	0.752 (0.234)	0.694 (0.271)	2.841*** (0.000)
G2	-0.199 (0.143)	-0.225 (0.175)	-0.212 (0.210)	-0.53*** (0.009)
IFI	0.267*** (0.000)	0.112 (0.188)	0.115 (0.167)	0.312*** (0.000)
M*G	-0.042 (0.816)	0.030 (0.878)	0.047 (0.817)	-0.52** (0.050)
M*G2	0.007 (0.853)	0.012 (0.788)	0.009 (0.855)	0.09* (0.078)
IFI*M	-0.011 (0.500)	-0.003 (0.888)	-0.003 (0.878)	-0.02 (0.311)
HCI	0.904*** (0.000)	1.108*** (0.000)	1.108*** (0.000)	0.872*** (0.000)
IQ	0.183*** (0.000)	0.076** (0.043)	0.087** (0.021)	0.141*** (0.000)
K	0.096*** (0.000)	0.093*** (0.010)	0.091*** (0.000)	0.06* (0.084)
Trade	-0.133*** (0.000)			-0.132*** (0.000)
Constant	-2.882*** (0.000)	-2.388 (0.782)	-2.392* (0.067)	-4.882*** (0.000)
No. of obs.	1147	1147	1147	996
No. of countries	51	51	51	51
No. of instruments				10
R-Square	0.83	0.77	0.78	0.83
F-stat	488.76 (0.000)	68.36 (0.000)	686.39 (0.000)	441.09 (0.000)
Hausman Test		6.041 (0.712)		
Hansen J Test				2.433 (0.119)

Notes: As for Table 9.1a except that M*G is the interaction of money supply and government spending, M*G2 is the interaction of money supply and squared government spending. IFI*M is the interaction of money supply and financial inclusion.

Table 9.6b: Impact of Money Supply given Government Expenditure and Financial Inclusion Levels on Inclusive Growth

IFI	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=2.086	0.173***	0.073*	0.078**	0.180***
	(0.000)	(0.060)	(0.044)	(0.000)
P50=2.718	0.165***	0.071*	0.076*	0.169***
	(0.000)	(0.099)	(0.075)	(0.000)
P75=3.205	0.160***	0.070	0.075	0.160***
	(0.000)	(0.154)	(0.122)	(0.000)
		G=P50=2.540		
P25=2.086	0.171***	0.092**	0.096**	0.172***
	(0.000)	(0.018)	(0.012)	(0.000)
P50=2.718	0.164***	0.090**	0.094**	0.160***
	(0.000)	(0.037)	(0.026)	(0.000)
P75=3.205	0.158***	0.088*	0.093*	0.152***
	(0.000)	(0.070)	(0.053)	(0.000)
		G=P75=2.760		
P25=2.086	0.170***	0.113***	0.116***	0.171***
	(0.000)	(0.009)	(0.006)	(0.000)
P50=2.718	0.163***	0.111**	0.114**	0.160***
	(0.000)	(0.017)	(0.012)	(0.000)
P75=3.205	0.158***	0.109**	0.113**	0.151***
	(0.000)	(0.033)	(0.024)	(0.000)
Notes: As for Table 9.1b.				

The models of FE and RE in Table 9.6c show that given supply, government expenditure at the low and median levels does not affect inclusive growth significantly but a high level of government expenditures with low money supply affects inclusive growth negatively. The results of POLS and FE-IV models demonstrate that a low level of government expenditures positively affects inclusive growth at all levels of money supply while the median level of government spending affects inclusive growth positively given the median level of money supply only. For high levels of expenditures given the median level of money supply, the model of POLS shows a significant negative impact. The

model of FE-IV shows an insignificant impact of high expenditure on inclusive growth because the growing expenditures reduce economic efficiency.

Table 9.6c: Impact of Different Levels of Government Expenditures Given Money Supply Levels on Inclusive Growth

Money Supply	POLS	FE	RE	FE-IV
		G=P25=2.337		
P25=3.438	0.105***	0.004	0.007	0.123***
	(0.000)	(0.946)	(0.906)	(0.000)
P50=3.798	0.106***	0.036	0.038	0.124***
	(0.000)	(0.579)	(0.545)	(0.000)
P75=4.118	0.106***	0.064	0.066	0.125***
	(0.000)	(0.359)	(0.333)	(0.000)
		G=P50=2.540		
P25=3.438	0.033	-0.069	-0.066	0.042
	(0.122)	(0.315)	(0.334)	(0.106)
P50=3.798	0.031***	-0.036	-0.033	0.034*
	(0.081)	(0.559)	(0.574)	(0.082)
P75=4.118	0.029	-0.006	-0.004	0.027
	(0.146)	(0.919)	(0.934)	(0.207)
		G=P75=2.760		
P25=3.438	-0.043	-0.150*	-0.145*	-0.045
	(0.128)	(0.081)	(0.086)	(0.205)
P50=3.798	-0.044*	-0.114	-0.112	-0.037
	(0.063)	(0.115)	(0.113)	(0.154)
P75=4.118	-0.045	-0.083	-0.082	-0.031
	(0.101)	(0.223)	(0.201)	(0.297)
Notes: As for Table 9.1b.				

A Trade-off between dimensions of inclusive growth is observed at a high level of government spending when the results of 9.6c are compared with the results of Table 6.6c, 7.6c and 8.6c. Increased levels of government spending given median to a high level of money supply affect economic and environment dimensions negatively while its effect on social dimension is positive. Therefore the net effect on the aggregated index of inclusive growth is not significant. This result is in accordance with the study of Keefar and Knack (2007) who argue that in developing countries due to ineffective governments,

levels of government spending and productivity are inversely related and causes a negative effect on economic dimension and the scale effect causes the environment to deteriorate. Thus, our results suggest a low level of government expenditures given a high level of the money supply to be a more effective policy option to promote inclusive growth.

The results in Table 9.6d show that given money supply at the 25th percentile, an increase in financial inclusion affects inclusive growth positively and significantly. This result is consistent with the findings of Khan (2011) who believes that financial inclusion via engaging many individuals in the formal financial transactions leads to improvement in the financial status of the poor by increasing economic opportunities and employment and therefore increases the effectiveness of monetary tools. Kakwani and Pernia (2000), Beck et al. (2004), and Clarke et al. (2003) provide evidence that an inclusive financial system plays a vital role in reducing poverty and income inequality and hence promotes inclusive growth. Easy access to financial services makes the poor able to shield themselves against unfavorable shocks and thus helps to increase their welfare. However, the level of effectiveness decreases slightly with the increase in the money supply. At higher levels of money supply, the increase in economic activities affects the environmental quality negatively and thus reduces the positive effect of financial inclusion.

Table 9.6d: Impact of Financial Inclusion Given Money Supply Levels on Inclusive Growth

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.229***	0.101***	0.103***	0.248***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=3.798	0.224***	0.100***	0.101***	0.241***
	(0.000)	(0.001)	(0.000)	(0.000)
P75=4.118	0.221***	0.099***	0.100***	0.236***
	(0.000)	(0.002)	(0.001)	(0.000)
Notes: As for Table 9.1b.				

Models given in equation 9.4 analyze the interactive roles of government spending, money supply, and financial inclusion on inclusive growth; while to evaluate the composite impact of tax revenue, money supply, and financial inclusion on inclusive growth, the model given in equation 9.5 has been formulated. Table 9.7a shows the interactive impact of money supply, tax revenue, and financial inclusion on inclusive growth. Except for trade, which affects inclusive growth negatively, other the control variables are found to improve inclusive growth significantly.

To investigate the role of money supply, tax revenue and financial inclusion, a derivative of the model has been taken with respect to the money supply, tax revenue, and financial inclusion.

$$IGI_{it} = \emptyset_0 + \emptyset_1 M_{it} + \emptyset_2 TX_{it} + \emptyset_3\, IFI_{it} + \emptyset_4 M * TX_{it} + \emptyset_5 IFI * M_{it} + \emptyset_6{}'Z_{it} + \text{vi} + \omega t + u_{it} \quad (9.5)$$

$$\frac{\partial IGI}{\partial M} = \emptyset_1 + \emptyset_4 TX_{it} + \emptyset_5 IFI_{it}$$

$$\frac{\partial IGI}{\partial TX} = \emptyset_2 + \emptyset_4 M_{it}$$

$$\frac{\partial IGI}{\partial IFI} = \emptyset_3 + \emptyset_5 M_{it}$$

In equation (9.5), Z is the vector of control variables while the derivative of IGI with respect to M shows that the impact of money supply on inclusive growth is influenced by levels of tax revenue and financial inclusion. The derivative of equation (9.5) with respect to TX shows that the effect of tax revenue on inclusive growth is conditional on levels of the money supply. The derivative of equation (9.5) with respect to IFI indicates that the relationship between financial inclusion and inclusive growth is influenced by the level of the money supply.

To assess the impact of money supply, 25th, 50th and 75th percentiles of tax revenue and financial inclusion have been assumed. Table 9.7b shows the impact of an increase in money supply given different levels of financial inclusion and tax revenues. Given financial inclusion and tax revenue at the 25th percentile, an increase in money supply exerts a positive effect on inclusive growth however keeping tax revenue at the 25th percentile this effect of money supply reduces with the increase in the level of financial inclusion because, as discussed earlier, high level of financial inclusion in developing countries lead to low social welfare and environmental degradation due to scale effect. On the other hand, keeping financial inclusion constant, the effectiveness of monetary policy also reduces with an increase in tax revenue because the negative growth effect of taxes (due to tax distortion) reduces the positive growth effects of money supply (due to increased aggregate demand).

Table 9.7a: Interactive Impact of Tax Revenue, Money Supply and Financial Inclusion on Inclusive Growth

Variables	POLS	FE	RE	FE-IV
M	0.303***	0.183***	0.185***	0.390***
	(0.000)	(0.008)	(0.000)	(0.000)
TX	0.303***	0.134	0.136	0.422***
	(0.000)	(0.203)	(0.198)	(0.000)
IFI	0.249***	0.153*	0.155	0.268***
	(0.009)	(0.086)	(0.600)	(0.000)
TX*M	-0.055***	-0.026	-0.025	-0.08***
	(0.000)	(0.297)	(0.283)	(0.000)
IFI*M	-0.003	-0.012	-0.013	-0.006
	(0.847)	(0.573)	(0.568)	(0.757)
HCI	0.938***	1.221***	1.198***	0.892***
	(0.000)	(0.000)	(0.000)	(0.000)
IQ	0.163***	0.106**	0.113**	0.144***
	(0.000)	(0.039)	(0.022)	(0.000)
K	0.083***	0.087*	0.086*	0.072***
	(0.000)	(0.076)	(0.062)	(0.000)
Trade	-0.146***	-0.074*	-0.081**	-0.14***
	(0.000)	(0.081)	(0.043)	(0.000)
Constant	-2.173***	-2.67**	-2.689***	-2.248***
	(0.000)	(0.033)	(0.010)	(0.000)
No. of obs.	1147	1147	1147	696
No. of countries	51	51	51	51
No. of instruments				15
R-Square	0.828	0.75	0.79	0.83
F-stat	538.420***	54.625***	453.142***	517.666***
	(0.000)	(0.000)	(0.000)	(0.000)
Hausman Test		8.011		
		(0.532)		
Hansen J Test				1.288
				(0.256)

Notes: As in Table 9.1a except that M is money supply, TX is the tax revenue, IFI is index of financial inclusion, TX*M is the interaction of money supply and IFI*M is the interaction money supply and financial inclusion.

Table 9.7b: Impact of Money Supply Given Tax Revenue and Financial Inclusion Levels on Inclusive Growth

IFI	POLS	FE	RE	FE-IV
Tax=P25=2.390				
P25=2.086	0.160*** (0.000)	0.077 (0.198)	0.080 (0.159)	0.165*** (0.000)
P50=2.718	0.159*** (0.000)	0.073 (0.262)	0.077 (0.219)	0.163*** (0.000)
P75=3.205	0.158*** (0.000)	0.069 (0.99)	0.073 (0.278)	0.161*** (0.000)
Tax=P50=2.654				
P25=2.086	0.146*** (0.000)	0.071 (0.257)	0.075 (0.213)	0.142*** (0.000)
P50=2.718	0.144*** (0.000)	0.066 (0.323)	0.070 (0.277)	0.140*** (0.000)
P75=3.205	0.143*** (0.000)	0.062 (0.385)	0.066 (0.338)	0.138*** (0.000)
Tax=P75=2.928				
P25=2.086	0.131*** (0.000)	0.063 (0.33)	0.068 (0.281)	0.119*** (0.000)
P50=2.718	0.130*** (0.000)	0.059 (0.396)	0.063 (0.346)	0.117*** (0.000)
P75=3.205	0.128*** (0.000)	0.055 (0.457)	0.059 (0.407)	0.115*** (0.000)
Notes: As for Table 9.1b.				

The results in Table 9.7c show the impact of tax revenue given different levels of the money supply. The models of FE and RE show that the impact of tax revenue on inclusive growth is insignificant. Whereas given money supply at a low level, POLS and FE-IV models show a positive and significant impact of an increase in tax revenue on inclusive growth because an increase in tax revenues are used to finance social goods and also bring environmental quality while at higher levels of money supply the effectiveness of tax revenue in promoting inclusive growth reduces because in the long-run inflation rate goes up due to increase in money supply and adversely affects the welfare of low-income group more than the rich. Comparison of this result with results in Table 6.5c,

7.5c and 8.5c point out the trade-off between dimensions of inclusive growth. The positive effect of tax on economic and environmental dimension reduces with an increase in money supply while the increase in tax affects social dimension negatively given median to a high level of the money supply.

Table 9.7c: Impact of Tax Revenue Given Money Supply Levels on Inclusive Growth

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.115***	0.044	0.048	0.127***
	(0.000)	(0.398)	(0.334)	(0.000)
P50=3.798	0.090***	0.035	0.039	0.096***
	(0.000)	(0.504)	(0.428)	(0.000)
P75=4.118	0.078***	0.026	0.031	0.069***
	(0.001)	(0.618)	(0.535)	(0.000)
Notes: As for Table 9.1b.				

Results in Table 9.7d show that given in money supply at the 25th percentile an increase in the level of financial inclusion affects inclusive growth positively and significantly. This result is in line with the view of Subbarao (2009) who asserts that financial inclusion leads to sustainable economic growth and provides economic opportunities to the maximum through financial services and reduces transaction costs thus inclusive growth improves. Attanasio and Kaufman (2009) suggest that financial ease removes the financial barriers to achieve higher education thus improves social inclusiveness by making people able to participate in the growth process. However, the level of effectiveness of financial inclusion in promoting inclusive growth slightly reduces due to an increase in the money supply. Comparing the results in Table 9.7b, 9.7c, and 9.7d, increasing financial inclusion given the low level of the money supply comes out to be a relatively effective policy to amplify inclusive growth.

Table 9.7d: Impact of Financial Inclusion Given Money Supply Levels on Inclusive Growth

Money Supply	POLS	FE	RE	FE-IV
P25=3.438	0.237***	0.110***	0.111***	0.256***
	(0.000)	(0.000)	(0.000)	(0.000)
P50=3.798	0.236***	0.105***	0.107***	0.254***
	(0.000)	(0.000)	(0.000)	(0.000)
P75=4.118	0.235***	0.102***	0.103***	0.252***
	(0.000)	(0.000)	(0.000)	(0.000)
Notes: As for Table 9.1b.				

Overall, the above results suggest that fiscal and monetary policy can play a significant and positive role in making growth inclusive. Furthermore, these fiscal and monetary policy actions are not independent, that is, the effectiveness of one policy depends on changes in other policy and thus effective and mutually consistent fiscal and monetary coordination is required to achieve the target of inclusive growth.

CHAPTER 10

CONCLUSION AND POLICY IMPLICATIONS

This chapter concludes the results discussed in chapters 4 to 9. One of the main objectives of this dissertation is to identify the dimensions of inclusive growth and construction of an aggregated index of inclusive growth. Inclusive growth is a concept of equal opportunities for all to participate in and benefit from growth. Based on reviewed literature this study identified three dimensions of inclusive growth, that is, growth should be inclusive in terms of economic, social, and environmental dimensions. Growth is economically inclusive if it causes an increase in per capita real GDP, corrects income distribution, and provides economic infrastructure and productive employment for maximum. Similarly, growth is socially inclusive if all individuals in the economy have access to education, health, social security and there is no discrimination across gender. While environmentally inclusive growth means environment-friendly growth, that is, it doesn't lead to deforestation. consumption of fossil fuels, and provide access to drinking water and sanitation for all irrespective of whether they belong to an urban or rural area.

Keeping in view the second objective, this study analyzed the interactive role of the monetary and fiscal policy along with financial inclusion to promote economically inclusive growth. Results suggest that expansionary monetary and fiscal policy by stimulating aggregate demand improves output and employment situation in the developing region. At low levels of government spending, due to corresponding lower levels of aggregate demand, the economy's growth will be slow-paced. On the other hand, higher expenditures bring about a negative impact on economic inclusive growth because increased government consumption expenditures require huge financing through

heavy taxation and local and external debts. It is therefore that an enlarged government size leads to inefficiencies.

Discussing the interactive role of fiscal and monetary policy, in an economic situation where government consumption expenditures are high, an increase in money supply leads to a decline in the economic dimension of inclusive growth because the inflationary pressure created by increased money supply causes government expenditures to increase faster than revenue thus, causes budget deficit that affects economic stability and causes a reduction in output and employment. On the other hand, increasing the money supply at any level of taxation brings about positive change but the effect is stronger at a low level of taxation because, at high taxation, the distortionary effect may hinder growth but still the positive effect of money supply dominates.

Since Bagehot (1873)'s work on the importance of financial development, a new concept is emerged known as financial inclusion. It is an idea that there should be monetary ease for everyone in the economy. Financial inclusion is found to affect inclusive growth positively at all levels of money supply because it helps to sustain the saving-investment cycle and helps the poor to shield themselves against adverse effects of economic shocks thus, improves economic inclusiveness. However, results suggest that monetary policy can have a stronger impact on the economic dimension given low government expenditures and tax revenue and high financial inclusion.

To analyze the role of macroeconomic policies in improving socially inclusive growth, this study examines the impact of monetary policy, fiscal policy, and financial inclusion on the social dimension. Based on results, we conclude that government expenditures

affect social inclusiveness because the provision of a public good is the job of government, however high levels of expenditure do not affect social inclusiveness significantly. After all, in the context of social welfare, it is the composition of the government expenditure that matters rather than the size. If government expenditure carries a high share of development expenditures, it will lead to social inclusiveness. Tax revenue is also found to affect social inclusion positively because tax revenue is the major source in developing countries to finance their public expenditures. Expansionary monetary policy leads to enhance socially inclusive growth because through the interest rate and credit channel monetary policy promotes investment in education and health and also encourages women entrepreneurs to invest by providing loans at lower interest rates.

Regarding the interactive role of macroeconomic policies and financial inclusion, we can conclude that high levels of government expenditure combined with high levels of money supply help the government to provide social goods and thus affect social inclusion positively. In developing countries, at the time of lack of resources, money supply through seigniorage helps the government to finance social goods. On the other hand, the effectiveness of money supply in improving social inclusion reduces conditional to a high level of tax collections while an increase in tax revenue given that the economy is facing inflation associated with high money supply affects social inclusion negatively because already prevailing inflationary pressure created by excess money supply and distortionary effect of taxation combine makes the socially neglected groups worse-off.

A well-developed financial structure, through the mobilization of resources, raises investment in education and health thus promotes social inclusion. Results on the effectiveness of monetary policy given government expenditure and financial inclusion

suggest that the effect of an increase in money supply has a large effect on social inclusion given the low level of financial inclusion and high government expenditures. In economies where more focus is given to make physical capital rather than human capital, social inclusion gets affected negatively due to an increase in financial inclusion because an increase in money supply by lowering interest rate attracts people towards investment in physical capital. In the same line, Money supply affects social inclusion more effectively given the low level of tax revenue and financial inclusion. The impact of financial inclusion conditional to low levels of money supply affects social inclusion strongly.

Regarding the environmental aspect, we conclude that the low level of government expenditures affects the environmental dimension of inclusive growth positively while at high levels it affects the environmental dimension negatively. Here the composition of government expenditure again comes to play its role. If the government spends more on private goods, for example, subsidies on fossil-fuel consumption and energy consumption, it affects the environment adversely however expenditures on education make people understand the importance of environmental quality. An increase in tax revenue affects the environment positively because tax revenue collected through environmental tax causes a reduction in pollution creating activities.

An increase in the money supply also helps to improve the inclusive environment because through interest rate and credit channel it encourages firms to make innovations and invest in R&D so that energy-efficient and environment-friendly production techniques could be adopted, however, the effectiveness of money supply gets negatively affected given a high level of tax revenue because tax revenue by raising the cost of

production prevent firms to opt new technologies but yet the positive effect dominates. The money supply is observed to affect environmental inclusion positively given low levels of government expenditures and financial inclusion because, at high levels of financial inclusion and government expenditure, the scale effects emerge and reduces the positive effect of the money supply.

Concerning financial inclusion, this study concludes that an increase in financial inclusiveness promotes environmental inclusiveness because by affecting the welfare of people, the attention of people gets deviated from consumption goods to environmental quality. But conditional to the higher money supply, the effectiveness of financial inclusion slightly reduces yet positive, because financial inclusion increases the interest rate elasticity of aggregate demand and thus induces the scale effect, and the environment gets affected adversely due to overutilization of resources.

Since inclusive growth means inclusiveness in terms of economic, social, and environmental aspects, the impact of macroeconomic policies and financial inclusion has been analyzed on the aggregated index of inclusive growth. We can conclude that the impact of tax revenue is positive because it is used to finance government expenditures, corrects income distribution, and reduces the rate of environmental deterioration. Government expenditures by providing public goods accelerate the growth rate and increase inclusiveness by making socially neglected group participate in the growth process, however, high expenditures affect inclusive growth negatively because to finance high expenditures, high tax revenue is needed and at high expenditures, the distortionary effect of taxes dominates and affects economic and social inclusiveness negatively.

An increase in the money supply affects inclusive growth positively because through stabilizing aggregate demand, money supply leads to sustainable growth and a stable rate of employment and inflation. The effectiveness of money supply increases given high expenditures, because at high expenditures, money supply, through its role of seigniorage, comes to rescue imbalances in the fiscal budget and supports welfare programs. In the presence of financial inclusion, money supply through interest rate and credit supply channel boosts up aggregate demand and economic growth while high levels of financial inclusion cause an increase in income inequality in developing countries due to moral hazards and asymmetric information (Tita and Aziakpono, 2017). Though combinations of money supply and financial inclusion affect inclusive growth positively the combination is more effective if the financial structure is more inclusive given low levels of the money supply. On the other hand, keeping financial inclusion constant, the effectiveness of monetary policy reduces with an increase in tax revenue because the negative growth effect of taxes (due to tax distortion) dominates the positive growth effects of money supply (due to increased aggregate demand).

Policy Implications

Based on the findings of this study and keeping in view the research objective, some policy recommendations can significantly contribute to the inclusive growth of developing countries. If a country wants to have inclusive growth, it must look at all dimensions, that is, economic, social, and environmental, and suggest the policies accordingly because the macroeconomic policies may affect one of the dimension positively and other negatively at the same time. Thus, here are a few policy implications

- If a country is more focused on economic inclusiveness then expansionary fiscal and monetary policies are effective but it is observed that high expenditures in developing countries, that leads to debt crises, not only directly affect economic inclusiveness but also reduces the effectiveness of monetary policy therefore the government should cut its spending. However, as discussed in the results section, both the size and composition of government consumption expenditures matter, development expenditures on infrastructure, education, and health, etc. get more share of total government spending then it leads to more inclusiveness in terms of all dimensions. Thus, an increase in money supply with a low to medium level of government expenditure is a favorable policy option. Regarding financial inclusion, since it is believed to influence the sensitivity of aggregate demand to interest rate, it is suggested that if a country aims to achieve economic inclusiveness, it should provide monetary ease for all individuals by increasing bank branches, provision of ATMs and other financial services and especially to those living in rural areas. Another suggestion in this regard is that those who are new to financial instruments should be briefed about moral hazards and other risks so that they can get the true benefits of financial services.

- A country with low levels of social inclusiveness should be more focused on the composition of its government spending and tax structure. A higher proportion of spending on social goods and services makes individuals socially inclusive given the availability of resources. Relying on tax revenues only to finance government expenditures is not a good option for developing countries because these countries possess a regressive tax structure that affects the economic and social wellbeing of

individuals unfavorably. There should also be a debate on how these expenditures will be financed. In developing countries, financial inclusion shifts the attention of individuals from human capital to physical capital therefore it reduces the effectiveness of the money supply. Thus, financial services are to be provided specifically for education and health and women entrepreneurs to improve social inclusiveness.

- The money supply is observed to affect environmental inclusion positively given low levels of government expenditures and financial inclusion because, at high levels of financial inclusion and government expenditure, the scale effects emerge and reduces the positive effect of the money supply. Thus, in countries where environmental sustainability is the main concern, expenditure on R&D needs to be raised so that energy-efficient and environment-friendly technologies could be introduced.

- Concerning fiscal policy, to achieve overall inclusive growth, this study suggests that an appropriate tax structure that aims to correct income disparities and environmental degradation along with public goods oriented composition of government spending helps to promote inclusiveness. Most of the OECD countries have been using cash transfer schemes to promote inclusive growth therefore an attempt of using targeted cash transfer schemes that benefit the marginalized section can be an effective measure to bring inclusive growth in developing countries. Although money supply through stabilizing aggregate demand leads to sustainable growth and a stable rate of employment and inflation but its effect is more influential given the low level of financial inclusion because it causes an increase in income inequality in developing countries due to moral hazards and asymmetric information (Tita and Aziakpono,

2017), thus there is need to make the financial system more transparent and risk absorbing. Furthermore, microfinance schemes should be promoted in developing countries because the extension of credit to low to moderate-income groups to start environment-friendly small-scale projects will help to ensure inclusive growth in the region.

- However, this study also suggests that a corruption-free and strong institutional structure makes the policies properly implemented and helps to get the desired results. Thus, a proper check and balance is needed and there should be well-built coordination between policies of government and institutions. Human capital is a strong factor in promoting inclusiveness of growth therefore developing countries should adopt policies related to human resource development that focus mainly on increasing the capability of people so that they could meaningfully participate in economic growth and development. Findings suggest that trade openness affects inclusive growth negatively because of the unwelcoming nature of the economy towards trade-related technological advances, therefore this study suggests that the economic capacity to absorb trade-related technologies are needed to be enhanced.

Future Directions

There are some limitations to this study that may pave the way for future research. For the construction of the financial inclusion index, the non-availability of demand-side data on barriers to access, which is of primary nature, limited the study to use only supply-side data. It takes a longer time to get primary data for all developing countries. But using the supply side dimensions of inclusive growth, we have tried to present the analysis of

financial inclusion on inclusive growth. As a limitation of the current study, further exploration of the composition of government spending and types of taxes in promoting inclusive growth may be considered in future work. Despite these limitations, the current study presents the diversity of positive and negative drivers of inclusive growth.

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Appendix

Table A1: Threshold Levels of KMO for Correlation Adequacy

S.No.	Threshold level	Level of adequacy
1	Below 0.5	Unacceptable
2	0.50–0.59	Miserable
3	0.60–0.69	Mediocre
4	0.70–0.79	Middling
5	0.80–0.89	Meritorious
6	0.90 and higher	Marvelous

Table A2: List of Countries

1.	Algeria	14.	Cote d'Ivoire	27.	Israel	40.	Peru
2.	Angola	15.	Dominican Republic	28.	Jamaica	41.	Philippines
3.	Bangladesh	16.	Ecuador	29.	Korea Rep.	42.	Senegal
4.	Bolivia	17.	Egypt Arab Rep.	30.	Malaysia	43.	South Africa
5.	Botswana	18.	El Salvador	31.	Mexico	44.	Sri Lanka
6.	Brazil	19.	Ethiopia	32.	Mongolia	45.	Thailand
7.	Cameroon	20.	Ghana	33.	Morocco	46.	Togo
8.	Chile	21.	Guatemala	34.	Mozambique	47.	Tunisia
9.	China	22.	Haiti	35.	Namibia	48.	Turkey
10.	Colombia	23.	Honduras	36.	Nicaragua	49.	Uruguay
11.	Congo Dem. Rep.	24.	India	37.	Pakistan	50.	Venezuela RB
12.	Congo Rep.	25.	Indonesia	38.	Panama	51.	Zambia
13.	Costa Rica	26.	Iran Islamic Rep.	39.	Paraguay		