ECONOMIC, POLITICAL, GEOGRAPHICAL, AND SOCIAL DETERMINANTS OF GREEN GROWTH; NEW INSIGHT OF SOUTH ASIAN COUNTRIES

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By
Name SADIA TANVEER
Roll No. MPEC-S19-002
Session: "2019-2021"

DEPARTMENT OF ECONOMICS AND COMMERCE
THE SUPERIOR COLLEGE, LAHORE

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Student Name: SADIA TANVEER Signature: _____

Roll No: MPEC-S19-002

Examination Committee:

a) External Examiner:
Name; DR .SHAZIA KAUSAR Signature: _____
Designation: PROF
Institute: LAHORE COLLEGE UNIVERSITY

b) Supervisor:
Name:MR. SHAHZAD ALI Signature: _____
Designation:LECTURER
Institute: SUPERIOR UNIVERSITY LAHORE

c) Dr. Shahan Mehmood Cheema Signature: _____
In-Charge
MS/M.Phil. Program
The Superior College, Lahore

e) Mr. Muhammad Haris Signature: _____
Additional Controller Examination
The Superior College, Lahore

DEDICATION

I dedicate my dissertation work to my family and friends. A special feelings of gratitude to my loving Husband,Brother and kids whose words of encouragement and tenacity ring in my ears.They have never left my side and are very special.I also dedicate this to my supervisor MR.SHAHZAD ALI who have supported me throughout the process & my friends who lend a hand a lot in the creation of Report.

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Abstract

The selected study is discussed the modern and environment-friendly measure of economic development in green growth. As the traditional economic measured are polluting the environment and causing a number of different adverse impacts on humans as well as a living organism. This study was conducted to assess the effect of economic, social, political, and geographical determinants on Green Growth among Asian Countries, by taking the secondary data from the year 2000 to 2015. The analysis portion provided that all the diagnostics and pre-requisite techniques are applied like normality, unit root, stationarity, and correlation. To predict the long-term and short-term relations between selected variables, ARDL model is applied as suggested by unit root test results. It is essential the different variables are stationary at level of first difference. The results of the correlation show that the bi-directional relationship between the variables, most of the variables are positively correlated with green growth. As noted from the EC term, here is mentioned as Coint Eq(-1), shows negative behavior with coefficient magnitude of −0.746. The estimated statistics of 74.6% of any variation in disequilibrium state is modified within one period. Furthermore, given a higher value of t-statistic namely −4.979, provided that the coefficient is highly significant (Tan & Tang, 2016).

Key Words: Green Growth, Economic Determinants, Social Determinants, Political Determinants, Geographical Determinants, ARDL, Normality, Unit Root

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CHAPTER ONE

1. Introduction

The word “Economic Development” has a history as like humanity, but the concept and definition of this term were continuously changed with the growth in science, technology, and innovation. This concept has drastically changed in the past, present and future. The most ancient and well-known concept of Economic Development is the GDP and its different measures like GDP, GDP per Capital, National Income, or Income per Capita, etc, and an increase in these statistics was referred to as economic growth. The said definition of Economic Development was in practice until the second world war. It was also referred to as the narrow version of development (Chau & Kanbur, 2018).

After the second world war, a number of technological revolutions were observed, which have resulted in the growth of human standards and innovation in industrial production. Human need and their satisfaction were changed from traditional to modern and innovative direction. Then the term of economic development was, needs to be revisited and must be measured and interpreted in modernized ways. From that time to the economic crises of 2008, it is referred to as a present period of economic development. When it was observed that the traditional measure of economic development has certain technicalities and not the true representation of growth and development. During the three decades, different researches and institutions measured the development with different proxies like health, education, human well-being, and living standards (Chau & Kanbur, 2018).

The industrial revolution makes this world more innovative and presented some outclass and unbelievable innovations. All these revolutions have changed the concept and style of human life and served humanity. At the same time, it was also noted that the industrial revolution not

only beneficial for humanity but also have a harmful effect on the environment as well as human health. Scientist and environmentalist economists have noted that the innovations are badly damaging the environmental health, and suffer the scientists toward a new challenge of global warming and unhealthy climate. To meet the said challenges, global environmental institutions have focused on a healthy environment, and introduced the concept of green growth. The economic development measurement through green growth directs toward the friendly environment, low carbon emission, and disposal of industrial waste. From now to onward is considered as the future of economic development, which will be measured through green growth and green development.

This research is about to discuss the concept of economic development in its modern and environment-friendly aspect of Green Growth. Environmental changes are converting the world into a global village, and more concentration is toward the protection of the environment, which transforms a pattern of green growth development, which has been promoted across the border to address the predicament of ecological deterioration and economic growth for more than an area (Chau & Kanbur, 2018) . The concept is equally popular among the emerging countries, "such as China, especially during the post-Copenhagen and post-crisis eras" Qin et, al 2019. Responding to environmental problems and policies as well as changing demand towards low pollution or energy-efficient products is the focus of green growth. There is a need to explore the concept of green growth in more depth. The concept of development has been widely discussed by researchers in academic as well as in institutional researches. Still, the idea of evolution in green growth is needed to be addressed to measure and raise the development in a friendly environment.

The origins of the Green Growth concept in Asia and the Pacific when more than fifty Governments and other stakeholders in the fifth Ministerial-level Conference regarding the and Development (MCED) unanimously agreed to pursue the path of green growth. Later on,

the green growth concept was highlighted and discussed in Europe, America, and developing countries, but a significant contribution in this regard has been observed among the Asian, especially among the South Asian economies, India, Pakistan, Bangladesh, Nepal, Sri Lanka, Afghanistan, Maldives and Bhutan (Samad & Manzoor, 2015). This region is considered as the world's leading producer of green products and services, with a significant and comparative advantage in key technical aspects, such as energy consumption and storage, and they are stronger innovators in selected areas such as biofuels, nuclear-based technology, and clean transportation. However, the policy incentives will arguably be required to realize this given potential (Fankhauser, Kazaglis, & Srivastav, 2017).

Revenue from environmental friendly goods and services is growing rapidly with a 4% turnover and enhances the economic performance (Kruse, Mohnen, Pope, & Sato, 2020). The OECD has concluded that different measurement tools are adopted by countries for implementing the green growth in a way that have contributed to raise employment opportunities, reduce the wastage of sources, reduce poverty, and strengthen a sustainable economy. As the expansion in economic opportunities in the perspective of rapid growth in population and threat in addressing the environmental pressures are significant challenges for the world economies, because if not addressed, could undermine our ability to seize these opportunities (Chanegriha, Stewart, & Tsoukis, 2017).

The primary objective of the Green Growth is to enhancing productivity by optimum utilization of natural resources, boosting investor confidence by considering the major environmental issues, like opening of new markets to stimulate the demand for green technologies, goods, and services, contributing to a fiscal consolidation green taxes, Reducing the risks of adverse shocks to growth and potentially irreversible environmental impacts (Schneider & Frey, 1985). The path of developing the green growth of an economy

depends on the policy, as well as institutional settings, social structures, development level, environmental pressure, resources endowments, regulation, technology transfers, innovation, market expansions, and access to financing (OECD, 2019).

Technological innovations are the cause of improving the social aspect of human beings, as these are sources to generate revenue as well as a source of income. Both these factors are one-sidedly resulting in a social aspect, while on the other side the industrial waste and omission of gases damaging the society. when the industrial revolutions are changing the corporate world, growth in the banking and industrial sector, also led toward the obliteration of a healthy environment same time, an astounding increase in consuming fossil fuel is always a threat for the environment. Therefore, it is considered that advancements in technology, have negatively impacted the environment (Umar, Ji, Kirikkaleli, & Xu, 2020). These environmental threats are shifting their economic structure from traditional toward sustainable and renewable energy resources and initiated economic and social-friendly technologies to preserve the environmental condition.

A number of global level institutes like OECD (Organization of Economic Countries and Development) with collaborative efforts with GGGI (Global Green Growth Institute), IIED (International Institute for Environment and Development), and GEC (Green Economy Coalition), are working to bring the green growth at forefront of economic development. The concept of implementation of green growth can be popular with the help of communication with citizens and government, to make the public aware of the problem, improving their lifestyle by protecting their rights, and ensure their benefit from green transformation (Norton & Boer, 2016).

The efforts are also started in different economies at different levels. South Africa has introduced the concept of an environmental job, social protection, and preserve biodiversity

and wetlands, similarly, Indonesia promoting the slashed fossil fuel subsidies to appeal to health insurance, Rwanda and Mexico are also promoting renewable energy investment. All these initiatives are initiated to achieve sustainable development goals, to recognize peace, environmental safety, and prosperity. An across-the-border document Paris Agreement also signed for climate change.

Fankhauser, Kazaglis, and Srivastav, (2017) argue that GDP (Gross Domestic Product) as a traditional and common measure of Economic Development, a number of economists have recorded their observation e.g., GDP has a positive correlation with human welfare and natural sources, while any hike in economic activity often results from a corresponding decrease in environmental worth. The research also recommended that green alternatives should be devised for economic development. The newly devised proxy of economic development was derived from sustainable development, and provide to comply with the needs of the current generation with no compromise with facilities of upcoming generations. Asian countries have understood the notion "need for green growth", and initiated practical work in this regard.

Economic growth is depending on different actors, political stability and regime are also one of these. Political stability is strongly related to economic growth, and countries with high economic development have a strong and consistent political structure (Schneider & Frey, 1985). The given argument was also mentioned from a historical perspective as well as in the modern economy. The reason behind this notion is that political structure has the authority to make and implement the revolutions and modern policies, for the betterment of the economy and well-being of the peoples. It is also observed that a number of countries, with low or weak, political stability have suffered a significant economic decline.

Economic development and growth are also affected by the geographical location and relation across the borders. The existence of a country with an industrial block, or near the sea port enhances the opportunities for trading and generating more and more revenues by selling goods and services, similarly, the part of the technological block provides the learning chances and opportunities for the rest of the economies, by sharing the technical knowledge (Chanegriha, Stewart, & Tsoukis, 2017) . Both these advantages are available for the South Asian World growing technological economy China, have opened the door for South Asian countries.

Economic growth and development are the backbones for the economic and social survival of the nations. It provides a number of facilities and improves the living style of peoples. The increase in economic growth evidence that there is potential in the economy, and generates a number of opportunities for employment for workers and investment opportunities for business entities. However, these development statistics are not much important to compromise for environmental and public health situations. Therefore, the focus of this research is to provide the evidentiary value and extend the literature that, health and safety of the environment and public are on a priority basis, while all other indicators are secondary, so there is a need to discuss and elaborate the need for shifting from traditional to environment-friendly growth. In the proposed scenario the attention is required toward renewable energy sources, reducing the emission of carbon dioxide, and minimize industrial waste by making recycling procedures.

1.1 Statement of Problem

Green Growth and Green Economy are not only important for Pakistan but also for other developing and developed countries, there is a series of emerging challenges, which required

to be addressed for sustainable growth is to occur. In the currently growing era of industrialization, and the replacement of existing technology with modernized versions, this situation is an opportunity for re-orientation for green growth. This transformation will result in, low-carbon trajectory, energy efficiency, use of low-carbon fuels, energy conservation, Environmental Tax Reform. Modern ways of innovation have been launched, and a new era of modern techniques has been started, which not only introduces a variety of products but also raises the speed of level of production Capasso et, al 2019: Kruse et al, 2020.

The economic improvement of a country is based on enhancement in technological development and innovative products, these are also considered a crucial element. Peoples have access to all the markets and able to select from a vast range of products across the global markets. New standards of living style have been developed with a lot of cultural and social changes. Still, on the other hand, all these technological advancements are severe threats to environment safety and the stock of natural resources (Manzoor & Samad, 2013; Fankhauser, Kazaglis, & Srivastav, 2017).

1.2 Question of Green Growth

The United States and other developed countries including some Asian Economies are realized that economic development is continuously decreasing the reserve of natural resources and on the other pollutant the environment. These countries have been shifting toward green growth sources of energy consumption, and green product development, to save the natural sources and environment (Owusu, 2015). The rapid industrial waste pushing the serious threats to human and climate health, although modern developments are essential for World, there is a threat to natural resources, as the under-utilization of resources will lead to misuse and wastage of these sources. That might be the cause of constraint in Green Growth initiatives, lack of competition, Market and Governance Failure, Viability of Environmental

Laws, Distortive taxes and subsidies, and allowing anti-competitive practices. As natural resources are limited availability, so there is a need to adopt and introduce new modern ways for the optimum utilization of natural resources. It is necessary to shift from non-green to green activity to affect the financial and economic performance in a green economy (Heshmati, 2014; OECD, 2019).

1.3 Research Questions

Following are the research questions:

1. Is there a significant and positive relationship between selected Economic Determinants and Green Growth?
2. Is there a significant and positive relationship between selected Political Determinants and Green Growth?
3. Is there a significant and positive relationship between selected Social Determinants and Economic Development Green Growth?
4. Is there a significant and positive relationship between selected Geographical Determinants and Green Growth?

1.4 The Objective of the Study:

Measuring the economic development in green growth indicators and proxies is an initiative to protect human health and the environment. The impact of growth can only be perceived with a healthy population, within a healthy environment. The objectives of this study are to demonstrate how green development growth is important for climate health, and what is it economic, social, political, and geographical determinants (Anwar, Aslam, & Yousaf, 2021).

1. To find out economic, political, social, and geographical determinants of green growth.
2. To develop a model of green growth for South Asian Countries.
3. This research is going to examine the relationship of selected determinants with green growth empirically.

1.5 Hypothesis

Since the purpose of this study is to broaden the development determinants of green growth, the study will evaluate the following assumptions related to the determinants, including their indicators.

Hypothesis 1:

Economic Determinants (Foreign Direct Investment & Inflation) can positively and significantly predict the degree of Green Growth in South Asian Countries.

Hypothesis 2:

Political Determinants (Govt efficiency ,Political Stability& Control Of Curruption) can positively and significantly predict the degree of Green Growth in South Asian Countries.

Hypothesis 3:

Social Determinants (Population Growth & Life expentency) can positively and significantly predict the degree of Green Growth in South Asian Countries.

Hypothesis 4:

Geographical Determinants (Vulnerable Employment Rate & Land Area) can positively and significantly predict the degree of Green Growth in South Asian Countries.

1.6 Theoretical Framework

Previous studies (Manzoor & Samad, 2013; Qin, X., Wang, X., Xu, Y., & Wei, Y., 2019) discussed that development is measured in the traditional approach of GDP, Employment, Poverty Line, Health and Educational Facilities. Still, these historical measured do not discuss the limitation and optimal use of natural resources. Green Growth in a country depends on different factors or situations these are called determinants of green growth or green growth. This research is going to extend the Politico-economic model 1985, by simultaneously including the social and geographical determinants of green growth. Green growth will be a dependent variable. Economic determinants, political determinants, social determinants, and geographical determinants will be independent variables.

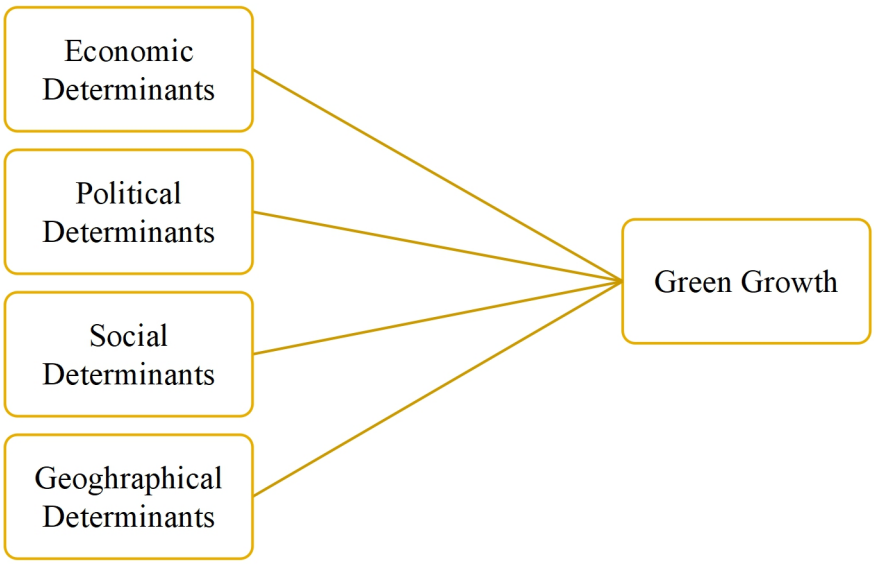

Figure 1 Proposed Model of Green Growth

2. Literature Review

In the recent era, globalized institutions and government bodies are considering environmental protection as a priority matter. Industrial revolutions and innovation are providing the facilities to the public, while on the other hand, these innovations are adding toxic pollutants to the environment. Many efforts and policies have been initiated globally to transform their economic and industrial structures for green development with increasing multifactor productivity integrated with environmental elements. In the Fourth Industrial Revolution, it was planned to adopt and adopt environmentally friendly technology to repair the environmental situation (Wang, Umar, Akram, & Caglar, 2021).

The term green growth is an emerging term and attracting researchers to explore and research the determinants affecting this term. Commonly used indicators were, FDI, prevention from global warming, carbon omission, however, thus far, there is not a single study that discusses the joint discussion of economic, political, and geographical determinants. Thus, this study will discuss the impact of economic, political, social, and geographical determinants for the development of green growth.

2.1 Theoretical Review:

FDI (Foreign Direct Investment) is the frequently used determinant for economic development, and FDI inflows are the driving force for recipient country, because investment whether it is local or foreign, significantly depends on FDI and other factors (Shi, 2019, p. 3). Changriha, Stuart and Sussex (2017) conducted research to understand the reasons for the flow of foreign direct investment (FDI) and why it remains a primary concern for economists and policymakers; Yet uncertainty surrounding FDI theories and experimental approaches has created ambiguity about FDI determinants. This paper applies Extreme Bound Analysis

to highlight the strong determinants of FDI. They used panel data from 1,586 countries from 1970 to 2006, considering a total of 58 potential geographic, political, and economic determinants and determined that about one-third eliminated freelance, education, corporate tax rates, government spending, Experience of infrastructure, natural resources, conflict, democratic governance, geographical location, number of borders, language and coastal location.

2.2 Economic Determinants and Green Growth:

Development in an economy is mostly measured through GDP and investment in a country along with other indicators. Foreign Direct Investment (FDI) is one of these, which not only increases the economic development in the economy but significantly protects the environment in the host country. Yue, Yang, and Hu, (2016) considered China as a case study in pursuing the background of green growth, and assess the role of FDI in environmental and economical perspectives. Slacks-based Measure through Directional Distance Function (SBMDDF) was applied to measure the green growth, environmental, and economic efficiency indexes. They empirically evaluate the data for the period of 2004 to 2011 was collected from 104 Chinese cities. It was observed that green growth efficiency is different in different cities, however, there is a shred of significant evidence that FDI is contributing toward the green growth efficiency, through economic and environmental benefits.

Samad and Manzoor (2015) explored non-industrial nations and examined the significant elements needs to foster green licenses, which at last re-inforce green development. They chose four components, (I) the implementation of protected innovation rights (IPRs), (ii) innovative work (R&D) consumptions, (iii) market size, and (iv) natural tariffs. They tried experimentally the green patent information to test the relationship of green licenses addressing the green advancements and IPR, R&D uses, market size, and ecological levies.

Keeping in see the accessibility of the information, they considered 11 created nations, (Austria, Australia, Canada, France, Japan, Finland, Germany, Sweden, United Kingdom, and the United States). They used the Fixed Impact Model (FEM) and the Irregular Impact Model (REM) for both the 1995-2010 equilibrium period and the 1995-2010 uneven period. They only show the equivalence period results depicted by the need for IPRs mainly affect green licenses while R&D concepts, market size, and environmental assessments mainly affect green licenses to improve green progress. They accepted that the authorization of informative factors will ultimately procure green development.

In order to minimize the harmful impact of industrialization, and protect the environment, government agencies across the world, are tending to adopt “green growth”, discoursing their ambitions to make their economies green. The main theme of this notion is to maintain and enhance the economic opportunities with a focus to save environmental sustainability. The said concept was supported by 113 recent scientific research articles from the fields of environmental issues and economic development, as well as Industrial innovations. An exploratory research method was applied to assess the heterogeneous contributions among the social science spectrum. The content of literature was reviewed under physical resources, technological innovation, market situation, institutional policies, as well as transitional and geographical skills. It was concluded that first, transforming toward green growth is essential, however, there is a need to have the competency to handle the non-traditional and complex situation, second, technological innovation should be equipped with greener technologies, third the awareness campaign should be initiated among the public and industrialists, finally, the geography should be considered for green growth, at different levels (Capasso, Hansen, Heiberg, Klitkou, & Steen, 2019).

Fankhauser, Kazaglis, and Srivastav, (2017) assessed the impact of carbon emission in Asian Economies, how these economies can be affected by this emission. It was observed that

Asian economies are tending toward low-carbon technologies, due to specialization in innovations, and comparative advantage toward climate change. The suggested measured used in these countries are efficient lighting and energy savings, photovoltaics, smart and nuclear grids. However, regional disparities are also observed within Japan, China, and Korea.

2.3 Social Determinants and Green Growth:

Developed and developing countries of the world are emphasizing on shifting from traditional sustainable economic development to green development due to social benefits. Industrialists and other manufacturing industries are limited to following social norms and customs.

Aldakhil, et al., (2018) identify the determinants of green business growth in supply chain management, environmental and socio-economic development for BRICS countries using secondary data from 1995 to 2015. It has concluded that there is a positive correlation between green logistics catalogs and per capita income. The results prove that supply chain management is integrated with economic growth and corporate policies. The panel performance analysis further confirmed the bilateral relationship between logistical indicators with per capita income and socio-economic factors, while a unilateral functional relationship was observed with carbon fossil emissions with logistical indicators across the country. Overall results have confirmed the need for an integrated supply chain model to support the growth of green businesses.

Green growth in the emerging period has received much attention in the recent past in micro, small and medium-sized industries. Primary data through questionnaires from 150 SME businesses of Rajasthan was collected to compile first-hand figures, after employing CFA and EFA. It was concluded that water, energy, sustainable green practices, and waste management methods were statistically positively and significantly correlated with

operational performance among the selected industries (Dadhich, Purohit, & A.Bhasker, 2021).

Hao, Umar, Khan, and Ali, (2021) analyzed the role of green growth development with environmentally adjusted multifactor green growth productivity on Carbon Dioxide emissions for G7 countries. The second-generation panel data method was applied to the time-series data from 1991 to 2017. It was concluded that both linear and non-linear terms for green growth reduce CO2 emissions, further reducing human capital, renewable energy, and environmental tax CO2 emissions. These studies are consistent with the concept of maintaining green growth environmental standards and strengthen the confidence of policymakers in developed and developing countries regarding the promotion of green growth.

Environmental protection is a big challenge for policymakers, as industrial growth making the environment unhealthy. There are a number of factors causing this along with economic activities, but ethnic diversity, political freedom, and institutional quality are the common social factors especially in developing countries. Time series panel data from 1996 to 2019 was collected from 116 developing countries, The ARDL tool was applied to evaluate the long-term relationship between selected variables. Findings show that the financial sector, energy consumption, GDP growth are the causes to increase CO2 emission in these countries, while political freedom, ethnic fractionalization, and institutional quality are reducing environmental deterioration (Madni, Anwar, & Ahmad, 2021).

Manzoor & Samad (2013) researched the economy of Pakistan. Their aim was to present sustainable development in a green growth / economic perspective of this country. Their selected determinants are: Intellectual Property Rights (IPR), Research and Development (Research and Development), and Environmental Tax Assessment. They conducted a survey of all related agencies in the country, directly or indirectly related to the development agenda

of green growth in IPR, research and development, and the passage of environmental taxes. They concluded that patenting green technology has a positive relationship with intellectual property rights. They concluded that intellectual property rights are an integral tool for developing countries like this to acquire climate change technology.

2.4 Political Determinants and Green Growth:

First of all, Ahmad (1979) concluded that political instability (frequency of government change, degree of administrative efficiency, number of internal armed attacks, degree of nationalism, the role of government in the economy per capita foreign aid, and colonial affiliation are adversely impact on FDI. He also examined the social determinants by taking, degree of education, Strength of labor movements, size of the middle class, the extent of urbanization, degree of modernization of outlook, as determinants of economic growth.

Chen, (1996) conducted research on 88 countries. They study the impact of the political environment on economic development. They chose three political determinants: (i) governance instability, (ii) political polarization, and (iii) government repression. Theoretical results from a mathematical model suggest that all determinants will have a negative impact on economic development. They recorded data for a period of 17 years: 1974-1990. They conduct a cross-sectional analysis of selected countries. The results provided preliminary confirmation of the three involved derived from the theoretical model.

Kruse, Mohnen, Pope, and Sato, (2020) concludes that significant private investment in capital resources and low-carbon technology is needed to meet climate change mitigation targets. This paper examines how production and diversification of production towards environmental products and services using the new green revenue dataset of global companies for the period 2009-2006 is related to the profitability and market valuation of firms. It has been observed that income from environmental products and services is growing

rapidly with a turnover of 4%. They discussed electricity and water and showed that green production enhances economic performance. However, the calculation of the rate of return on investment in green activity partnership investment did not necessarily increase, suggesting that capital expenditure is higher.

Schneider and Frey, (1985) proposed to apply four different models to explain the flow of economic development in the form of foreign direct investment using data from under-developed 60 countries. The data collected were compared with a pre-forecast and pre-post forecast. Of these four models, the politico-economic model that combines economic and political determinants performs best. It was found that the actual level of GNP per capita was directly proportional to FDI and inversely proportional to the balance of payments. Further, they conclude that bilateral assistance and multilateral assistance from Western countries have a stimulating effect and that political instability has significantly reduced the tendency for foreign direct investment. These researchers also suggested that economic and political determinants have a significant impact on the distribution of foreign direct investment. In a country where the political stability is poor, investors having a threat to their investment, as compared with politically stable countries (Schneider & Frey, 1985) . The empirical investigation of the literature shows that the determinants FDI deals insufficiently with politico-economic factors. Green (1972) empirically gave the answer to the question that political instability has a deterrent effect on economic progress. Another research proved that the investment level in-country decreases when political conditions are unstable, and vice versa Thunell (1977).

2.5 Geographic Determinants of Green Growth:

Sulich (2018) researched Poland. They focused on factors affecting green economy development. They tried to indicate sources of factors of green economy development and to

propose a solution for a grow first and clean up later. They recorded data from the Poland Main Statistical Office database. They performed exploratory factor analysis on recorded data on all regions of that country. They selected the Sustainable Development Indicators: (i) Groundwater Absorption Resources, (ii) Expenditure on Atmospheric Air and Climate Conservation, (iii) Fees and Receipts for Environmental Conservation and Water Management Fund, (v) Legally Protected Areas, (vi) Water The cost of resources earmarked for management, registered employment rate, postgraduate students and doctoral study participants (vii) average monthly expenditure on health per capita GDP and (ix) per capita fixed asset value. They performed analysis on statistical analysis for sustainable development indicators in are regions of Poland. They also calculated correlation. Findings showed that two main factors explained interdependencies between measurable variables there is space for action in the case of Poland to green its economy and introduce more eco-innovations and CSR.

Qin, Wang, & Xu, & Wei (2019) researched the iron and steel (IS) industry of China. They created a refreshing assessment model for assessing green development by joining the global Malmquist-Luenberger file and an Epsilon-based measure. They also proposed a large-scale erosion system to uncover the basic determinants of green development. The findings showed that the level of green development expanded by 0.80% per year and after the east-focus westward dispersion. Innovative advances and scale effectiveness are two policy proponents of China's IS mechanized green development, albeit with an administrative deficit and a scaling trend of acquiring specialized adversarial skills. The previously mentioned factors additionally assume various parts in upgrading the green development of dissimilar districts.

2.6 Significance of the Study:

This research is going to highlight the importance of green growth with respect to South Asian Countries, which will be useful for policymakers of South Asian countries, as well as in academic aspects it will open the door for new traders and junior scholars. This research will consider Green Growth as the modern measure of Economic Development. Literature shows that the concept of development is widely used and explored by researchers, but only a few researchers studied the Development in Green Growth concept. They have discussed the green growth as the causal and dependent variable, only a few of them used the causality relationship among Green Growth and selected determinants, but in this research, the concept of ARDL (Auto Regressive Dependent Lag) model will be used, further short term and long term relation will be measured by utilizing Engle-Granger co-incorporation test or greatest probability test (Anwar, Aslam, & Yousaf, 2021).

3. RESEARCH METHODOLOGY

The current study explores the relationship among the dependent variable Green Growth and different determinants selected from social, political, geographical, and economic sectors. The purpose of this study is to evaluate the development of green growth, to guide policymakers and other state institutes in drafting policies for green development. By shifting from traditional economic development to a modernized and environment-friendly concept of green growth, will not only beneficial for organizations but also protect the climate from adverse changes. In this study, bidirectional relation in short term and long term is projected through ARDL co-integration technique. The said method of ARDL co-integration was formed and introduce by Pesaran and Shin (1999) and (2001). This test is more reliable due to its validation principles. To measure the relationship among the variables there must be stationarity among the selected variables. From now on the validity of this method remains strong, the selected elements are fixed at the level I (0), the underlying contrast I (1), or a combination of both. The concept and use of the ARDL method have been additionally chosen to adapt to the time system, even with a small sample size and a small number of perceptions. Furthermore, the strategy is more reliable as contrasted, and Johansen and Julius co-mix for little examples (Anwar, Aslam, & Yousaf, 2021). Thirdly, it empowers the change in the present moment without influencing the speed of since quite a while ago run connection (Anwar, Aslam, & Yousaf, 2021).

Further, the validity of this method remains strong, the selected elements are fixed at the level I (0), the underlying contrast I (1), or a combination of both. The concepts and uses of the ARDL method are additionally preferred for scheduling, such as small sample size and a low number of concepts. (Anwar, Aslam, & Yousaf, 2021). Furthermore, the strategy is more reliable as contrasted, and Johansen and Julius co-mix for little examples. Thirdly, it

empowers the change in the present moment without influencing the speed of since quite a while ago run connection (Simionescu, 2016) this study will use the more reliable and valid test of co-integration by using the non-traditional measure of economic development.

3.1 Model Specification and justification of variables

To assess the dependency of Green Growth among the Asian Countries, below mentioned model is based on hypothetical and experiential literature.

$$\text{Green Growth} = f(IR, v)$$

Therefore, Green Growth is a function of social, political, economic, and geographical determinants and v symbolizes the variables from these determinants. Here the selected variables from each indicator are Green Growth is measured through FDI, and Inflation, political determinants include Government Efficiency, Political Stability, and control over corruption. Population Growth and life expectancy are selected under social determinants, while Geographical Determinants are comprised of Vomnurable Employment Rate, Land Area. The general model is specified by the given equation:

$$\mathbf{GG = \beta_0 + \beta_1(SD)_t + \beta_2(ED)_t + \beta_3(PD)_t + \beta_4(GD)_t + \mu_t}$$

Where, β_1, β_2, β_3, and β_4, are coefficients and μ_t is the disturbance term.

3.2 Endogenous Variables (GG)

The dependent variable analyzed in this study is the Green Growth and measured through FDI into Asian Countries. In previous studies, FDI was used as an increase in FDI, there 0were actual annual FDI inflows, annual FDI growth inflows, and per capita FDI. This study will consider FDI as an indicator of green growth ((Anwar, Aslam, & Yousaf, 2021).

3.3 Expected signs of Variables

In the light of related experiments, the following table shows the external factors and their expected signs, including reliable variable green development (unknown direct speculation, FDI) among Asian countries.

Table 1:

List of Variables

Variables	Variables	Reference
Green Growth	**CO2 Emission**	(Samad & Manzoor, 2015).
Economic Determinants	**Foreign Direct Investment**	(Chau & Kanbur, 2018).
	Inflation	
Geographical Determinants	**Land Area**	Sulich (2018)
	Vulnerable Employment Rate	
Political Determinants	**Political Stability**	Fankhauser, Kazaglis, and Srivastav, (2017)
	Government Efficiency	
Social Determinants	**Control Over Corruption**	(Chau & Kanbur, 2018).
	Life Expectancy	
	Population Growth	

3.4 Data Description and Sources

The secondary data for this study is collected from the World Bank Data source.

3.5 Econometric Tool

ARDL approach is applied through E-views 10 software for unit root, ARDL approach, along with its diagnostics tests like unit root, auto-correlation, heteroscedasticity, etc (Anwar, Aslam, & Yousaf, 2021).

4. DATA ANALYSIS

The Data Analysis section of this study is performed into the main co-integration technique (ARDL approach), diagnostics test. Diagnostic tests like unit root test to determine the stationarity of the data, correlation analysis is performed to assess the autocorrelation among the observations.

4.1 Unit Root Test

The first of the diagnostic results is the stationery test or unit root test. The N-J Peron test is applied to discover the writing elements of a given variable format. The motivation for using this test is that the ADF method is not suitable for a more limited number of perceptions. If the sensations do not use the exact N-j Peron technique. (Anwar, Aslam, & Yousaf, 2021). The results of the unit root test are given below:

Hypothesis:

Ho: The series is nonstationary.

Ha: The series is stationary.

Table 2

Unit Root test for selected variables

Variables	Methods	Statistics	P-Value	Statistics	P-Value
		Level		First Difference	
FDI	Levin, Lin & Chu t	-8.027	0.000		
	Im, Pesaran and Shin W-stat	-9.784	0.000		
	ADF-Fisher Chi-square	89.546	0.000		
	PP-Fisher Chi-square	141.277	0.000		
INF	Levin, Lin & Chu t	-0.708	0.239	-5.15930	0.000
	Im, Pesaran and Shin W-stat	0.122	0.548	-4.62632	0.000
	ADF-Fisher Chi-square	9.031	0.529	39.9402	0.000
	PP-Fisher Chi-square	8.931	0.538	71.6544	0.000
LAR	Levin, Lin & Chu t	1.284	0.900	-4.89178	0.000
	Im, Pesaran and Shin W-stat	0.115	0.545	-6.20210	0.000
	ADF-Fisher Chi-square	13.518	0.196	54.8652	0.000
	PP-Fisher Chi-square	24.816	0.005	122.249	0.000
VER	Levin, Lin & Chu t	-3.167	0.000		
	Im, Pesaran and Shin W-stat	-4.333	0.000		
	ADF-Fisher Chi-square	37.292	0.000		
	PP-Fisher Chi-square	71.226	0.000		
PS	Levin, Lin & Chu t	-1.035	0.150		
	Im, Pesaran and Shin W-stat	-3.056	0.001		
	ADF-Fisher Chi-square	29.182	0.001		
	PP-Fisher Chi-square	54.674	0.000		
GOE	Levin, Lin & Chu t	-2.002	0.022		
	Im, Pesaran and Shin W-stat	-2.798	0.002		
	ADF-Fisher Chi-square	30.423	0.000		
	PP-Fisher Chi-square	39.442	0.000		
COC	Levin, Lin & Chu t	-2.71934	0.0033	-3.8011	0.0001
	Im, Pesaran and Shin W-stat	-0.52691	0.2991	-4.9846	0.0000
	ADF-Fisher Chi-square	10.1228	0.4298	43.6221	0.0000
	PP-Fisher Chi-square	12.4305	0.2573	90.4277	0.0000
LE	Levin, Lin & Chu t	0.41074	0.6594	-7.029	0.000
	Im, Pesaran and Shin W-stat	0.01863	0.5074	-7.898	0.000
	ADF-Fisher Chi-square	8.13054	0.6161	71.495	0.000
	PP-Fisher Chi-square	10.3591	0.4096	85.468	0.000
PG	Levin, Lin & Chu t	-1.505	0.066	-5.162	0.000
	Im, Pesaran and Shin W-stat	0.402	0.656	-5.850	0.000
	ADF-Fisher Chi-square	7.032	0.722	52.646	0.000
	PP-Fisher Chi-square	4.594	0.917	86.115	0.000

The above table has shown the unit root of the dependent variable Carbon emission and energy consumption in the agriculture sector (ECIA), energy consumption in the industrial sector (ECII), energy consumption in the services sector (ECIS). The unit is used as a controlled variable in foreign direct investment (FDI), inflation (INF), land area (LAR), and foreign direct investment (FDI) according to the above results of the main test. However, for the purpose of verification, this section assigns different unit core tests to check whether the data is stable. Pesaran and Shin (2003) suggested the use of Fisher-type tests for ADF and PP to determine the unit-roots, it is supposed that all of the cross-sections face a common unit root process (Im et al., 2003). Converse to LLC, assume individual unit root processes across cross-sections included in the sample. Thus the rejection of the null hypothesis shows that the series is constant The results of the unit root test are presented in the table above. According to the results of selected variables, fuel consumption in the agricultural sector, fuel consumption in the industrial sector, fuel consumption in the service sector, Inflation (INF), and Land Area (LAR), used as controlled variables integrated at I (1) means first difference. The dependent variable, Green Growth, and controlled variables foreign direct investment are integrated at I (0) mean level.

The above table represents the unit root test, study is based on the results of four different tests, namely LLC and IMP and Shin W-stat, ADF-Fisher Chi-square, and PP-Fisher Chi-square test to confirm that variables are stationary or not as a requirement. It is important to check either variables are stationary or not, because if they are not stationary; non-stationary variables can produce different and spurious results for the study (Kahia et al., 2019). Auto distribution lag model techniques are more suitable for the selected variables as indicated by the results of panel unit root panel, (Asghar et al., 2015). Agriculture value addition, service value addition, and manufacturing value addition are significant at I(1) first difference.

Table 3

4.2 Descriptive Statistics

	GREEN_GROWTH	COC	FDI	GOV_EFF	INF	LIFE_EXP	POL_SLAND PG	TB	A	VER
Mean	58.8323	-0.5386	1.1197	-0.44175	7.2567	66.8330	1.5348	-1.20805	-0.4822	68.611
Median	52.6378	-0.6869	0.8794	-0.45682	7.0466	66.4300	1.3503	-1.34219	-0.4803	70.730
Maximum	93.4528	1.2803	6.3215	0.78453	26.418	76.3160	3.6827	1.28338	0.4765	91.720
Minimum	11.4827	-1.6382	-0.0983	-1.49608	-18.108	57.4180	-0.2669	-2.81003	-1.4044	36.780
Std. Dev.	22.5160	0.7061	1.0393	0.52869	4.9366	4.38749	0.7910	1.03991	0.5177	15.221
Skewness	0.11813	0.8784	2.2186	0.06186	-0.4300	0.37225	0.3955	0.76215	0.3212	-0.6187
Kurtosis	2.11669	3.2687	9.5762	2.55597	10.863	2.71934	3.1269	3.02453	2.3194	2.4008
Jarque-Bera	3.86676	14.609	291.08	0.98266	289.38	2.92788	2.9693	10.7491	4.0510	8.7422
Probability	0.14465	0.0006	0.0000	0.61181	0.0000	0.23132	0.2265	0.00463	0.1319	0.0126
Sum	6530.39	-59.784	124.29	-49.0350	805.49	7418.47	170.36	-134.093	-53.529	7615.2
Sum Sq. Dev.	55766.75	54.851	118.81	30.7466	2680.7	2117.50	68.824	118.955	29.483	25487
Observations	111	111	111	111	111	111	111	111	111	111

Table 3 provides that variables Inflation and vulnerable employment rate are negatively skewed. Kurtosis values of Green Growth, Government Efficiency, Life Expectancy, and Population Growth are < 3 representing leptokurtic distribution, whereas other variables are Meso-kurtic distribution, they have kurtosis value > 3. The normality of the data is assessed by Jarque-Bera and the calculated p-value of the Jarquee-Bera test is > 0.01 which shows that the data is normally distributed (Anwar, Aslam, & Yousaf, 2021).

Table 4

4.3 Correlation Analysis

Correlation Probability	GREEN_GROWTH	COC	FDI	GOV_EFF	INF	LIFE_EXP	PG	POL_STB	LANDA	VER
GREEN_GROWTH	1.000									
COC	0.6704	1.000								
	0.0000									
FDI	-0.1487	0.166	1.000							
	0.1192	0.078								
GOV_EFF	0.5014	0.890	0.235	1.000						
	0.0000	0.000	0.012							
INF	-0.1209	-0.130	0.162	-0.0924	1.000					
	0.2061	0.171	0.087	0.3348						
LIFE_EXP	0.1366	0.265	0.068	0.2867	0.112	1.000				
	0.1527	0.004	0.473	0.0023	0.239					
PG	-0.5138	-0.42	0.035	-0.3798	-0.119	-0.7389	1.000			
	0.0000	0.000	0.712	0.0000	0.210	0.0000				
POL_STB	0.6257	0.843	0.076	0.78669	-0.259	0.21024	-0.365	1.000		
	0.0000	0.000	0.422	0.0000	0.005	0.0268	0.001			
LANDA	0.0128	0.236	0.099 85 0.297 3	0.43286 6	0.1266 53	0.26427 5	-0.478 14 0.000 0	0.24016 7	1.0000 00	
	0.8932	0.012		0.00000	0.1853	0.0051		0.0111	-----	
VER	-0.0129	-0.151 49 0.112 5	-0.080 0.401 2	-0.2480 0.00870	-0.118 0.2169	-0.7683 0.0000	0.389 2 0.000 0	-0.0692 0.47020	-0.000 0.9958	1.000

In statistics, the correlation coefficient indicates the strength and direction of the linear relationship between the two variables. And its value is always between +1 and -1. To

explain its value, see the one closest to your relationship between the values below. If the value is exactly -1 or +1, it shows that the value is perfectly downhill and a negative or positive linear relationship is present. The value of correlation is 0.70 indicates a strong relationship between variables. A value less than 0.30 value shows the week relationship between the two variables. The value between 0.30 to 0.70 of correlation indicated the moderating relationship. Exactly 0 value indicates no correlation between variables. Why measure the amount of a linear relationship if it doesn't have enough to say? However, you can take the idea of linear relationships in two ways: if no relationship exists, it makes no sense to calculate the reciprocal relationship because the relationship only applies to linear relationships. If a strong relationship exists but it is not linear, then the relationship can be confusing, because in some cases strong curved relationships exist. It is therefore critical to examine the scatter plot first.

The above table is showing the results of the correlation test. This test is used for many different reasons but in our research, the correlation test is applied to find out the link between the variables and check the multicollinearity exists in the data or not. According to the discussion in the above paragraph, if the value near 1 rather it's positive or negative, its means there is multicollinearity in the selected variables. In this case, highly correlated variables should be removed otherwise results will mislead the policies (Ahmed, 2010). The above results of panel correlation shown the results of correlation which indicated that there is no multicollinearity found in the data. All the values of the correlation less the 0.30 except gross capital formation and gross domestic product (0.53) which indicated the moderating relationship.

Furthermore, in the present sector-wise correlation analysis is also being conducted. The findings confirm that energy consumption in the service sector has a moderate correlation with SVA, while other control variables have a week correlation. While energy consumption in agriculture and other control variables have a week correlation with agricultural value-added. While The findings of the correlation show that all the purposed variables have a high correlation with the IVA.

The Autoregressive Dependent Variable Lag ARDL procedure is applied on the basis of unit root results, because of various stationarity levels (Anwar, Aslam, & Yousaf, 2021). Assuming the fixed degree of factors are extraordinary, the ARDL approach is prescribed to assess the connection between endogenous and exogenous factors. Model selection is based on the Akaike data chart, further, the ARDL model has been investigated through additional examination.

4.4 Panel Autoregressive Distribution Lag Model

Table 5

ARDL Long-run

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	0.118	0.016	7.239	0.000*
	0.120	0.051	2.343	0.021**
	0.585	0.216	2.708	0.013*
	0.664	0.222	2.992	0.012*
	0.670	0.278	2.402	0.014*
	0.060	0.024	2.503	0.013*
	-0.654	0.319	-2.050	0.022**

Dependent Variable: GDP
Long-run Selected Model: ARDL (1, 1, 1, 1, 1, 1, 1, 1)
*Note: *, ** &*** refers to level of significance at 1%, 5% and 10% respectively.*

The above table has shown the results of the long-run coefficient all the variables are significant with the lag (1,1,1,1,1,1,1), according to the above results there is long-run relationship exist among the selected variables. Gross domestic production (GDP) taken dependent variable and Energy consumption in the agriculture sector (ECIA) (P<0.05), Energy consumption in the industrial sector (ECII) (P<0.05), Energy consumption in the services sector (ECIS) (P<0.05) and trade openness (TO) (P<0.05) are positively significant. Foreign direct investment (FDI), money supply (MS), and gross national expenditure (GNE) are taken as control and all control variables are positively significantly create an impact on gross domestic product except gross national expenditure has a negative insignificant impact on gross domestic products. In the case of South Asian countries, Pakistan, and India having problems on the border due to the line of control and maximum share of GDP appointed as expenditure on military reforms to control uncertainty of war and Bangladesh also focused to maintain their sustainability on the border. So, putting maximum effort to stay in peace.

A long-run relationship between dependent and independent variables is observed from the findings. The value of the coefficient indicated that with a 1% change in energy consumption in the agriculture sector, GDP will change 0.118%. energy consumption in the industrial sector changed by 1 % and GDP change by 0.12%. energy consumption in the services sector changed by 1 % and GDP change by 0.585%. trade openness changed by 1 % and GDP change by 0.66%. foreign direct investment changed by 1 % and GDP change by 0.67%.

money supply changed by 1 % and GDP change by 0.12%. gross national expenditure changed by 1 % and GDP, with a negative but significant relationship (Jiranyakul & Brahmasrene, 2007).

Table 6

Short Run ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
COINTEQ01	-0.746	0.149	-4.979	0.000*
	0.001	0.003	0.346	0.729
	0.000	0.000	1.693	0.094***
	0.004	0.003	1.302	0.196
	0.057	0.075	0.752	0.453
	0.288	0.247	1.166	0.246
	-0.008	0.011	-0.776	0.439
	0.185	0.170	1.093	0.277
	7.964	1.481	5.375	0.000*

*Note: *, ** &*** refers to level of significance at 1%, 5% and 10% respectively.*

The above results showed the short-run relationship between dependent and independent variables. In this study, there is a long-run relationship between dependent and independent variables. The panel autoregressive distribution lag model suggested by Rauch et al. (1999) is widely used to find the long-run as well as short-run relationship in panel data (Apergis & Payne, 2014; Ohler & Fetters, 2014). This approach suggests two estimators for model estimating, the choice between which depends on prior heterogeneity assumptions (see Methodology description). Therefore, in order to examine the short-run relationship between GDP and different types of variables, the applied panel ARDL approach, which accounts for developed by (Pesaran, 2004). Due to the limited number of observations, we can't estimate model specifications that consider more than three explanatory variables. According to the above results of short-run estimation.

Table 7

Dependent Variable: D(GREEN_GROWTH)
Method: ARDL
Date: 05/17/21 Time: 17:13
Sample: 2004 2015
Included observations: 97
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): VER' LANDA
Fixed regressors: C
Number of models evalulated: 6
Selected Model: ARDL(3, 2, 2)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
VER	1.544539	0.059960	25.75945	0.0000
LANDA	2.253603	0.248691	9.061873	0.0000
Short Run Equation				
COINTEQ01	-0.746	0.149	-4.979	0.000
D(GREEN_GROWTH(-1))	-0.201576	0.216797	-0.929791	0.3557
D(GREEN_GROWTH(-2))	-0.144624	0.152850	-0.946183	0.3473
D(VER)	-1.498409	2.057607	-0.728229	0.4689
D(VER(-1))	-1.481352	0.853190	-1.736252	0.0869
D(LANDA)	1.669901	3.770451	0.442892	0.6592
D(LANDA(-1))	5.562064	7.014286	0.792962	0.4305
C	-0.879569	9.427577	-0.093297	0.9259
Log-likelihood	-49.29709			

*Note: p-values and any subsequent tests do not account for model selection.

Hence the Coint Eq(-1), is negative with a coefficient value of −0.746. This indicates that about 74.6% of the variation in the disequilibrium state is modified within a given period. Furthermore, given a high-quality T-statistic called -4.979, it also supports that the coefficient is significant (Anwar, Aslam, & Yousaf, 2021).

Table 8

Economic Determinants

Dependent Variable: D(GREEN_GROWTH)
Method: ARDL
Date: 04/18/21 Time: 02:36
Sample: 2006 2015
Included observations: 119
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): FDI, INF
Fixed regressors: C
Number of models evalulated: 2
Selected Model: ARDL(1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
FDI	180.1066	1746.902	0.103101	0.9181
INF	13.73086	135.5866	0.101270	0.9196
Short Run Equation				
COINTEQ01	-0.001069	0.002858	-0.374066	0.7092
D(FDI)	-0.123694	0.231586	-0.534118	0.5946
D(INF)	-0.063314	0.036053	-1.756149	0.0824
C	-3.943682	3.120916	-1.263630	0.2096
@TREND	0.169677	0.185739	0.913528	0.3634
Log-likelihood	-163.0677			

*Note: Model selection is not considering the P-value and any subsequent tests.

Among the economic determinants, the Error correction term has a negative coefficient of -0.0010, which predicts low interrelationships among the economic determinants.

Table 9

Social Aspects

Dependent Variable: D(GREEN_GROWTH)
Method: ARDL
Date: 04/18/21 Time: 02:36
Sample: 2006 2015
Included observations: 119
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): FDI INF
Fixed regressors: C
Number of models evalulated: 2
Selected Model: ARDL(1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
FDI	180.1066	1746.902	0.103101	0.9181
INF	13.73086	135.5866	0.101270	0.9196
Short Run Equation				
COINTEQ01	-0.001069	0.002858	-0.374066	0.7092
D(FDI)	-0.123694	0.231586	-0.534118	0.5946
D(INF)	-0.063314	0.036053	-1.756149	0.0824
C	-3.943682	3.120916	-1.263630	0.2096
@TREND	0.169677	0.185739	0.913528	0.3634
Log likelihood	-163.0677			

*Note: Model selection is not considering the P-value and any subsequent tests.

Table 10

Political Determinants

Dependent Variable: D(GREEN_GROWTH)
Method: ARDL
Date: 04/18/21 Time: 02:39
Sample: 2003 2015
Included observations: 105
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): COC, GOV_EFF POL_STB
Fixed regressors: C
Number of models evalulated: 1
Selected Model: ARDL(1, 1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
		Long Run Equation		
COC	-14.12627	77.33060	-0.182674	0.8555
GOV_EFF	-190.6115	213.1225	-0.894376	0.3734
POL_STB	-98.08955	108.6108	-0.903129	0.3688
		Short Run Equation		
COINTEQ01	-0.007951	0.006107	-1.302004	0.1961
D(COC)	4.717827	3.207565	1.470843	0.1447
D(GOV_EFF)	1.826313	1.776624	1.027968	0.3066
D(POL_STB)	0.899424	0.492825	1.825039	0.0712
C	0.137194	1.799685	0.076232	0.9394
Log-likelihood	-131.0664			

*Note: p-values and any subsequent tests do not account for model selection.

With reference to the relation between green growth with economic and political determinants, the observed COINTEQ01 is very low, but negative, which indicates that there exists a relation between selected variables, with a low level of magnitude.

Table 11

Full modified

Dependent Variable: GREEN_GROWTH
Method: Panel Fully Modified Least Squares (FMOLS)
Date: 04/18/21 Time: 02:42
Sample (adjusted): 2003 2016
Periods included: 14
Cross-sections included: 7
Total panel (unbalanced) observations: 89
Panel method: Pooled estimation
Cointegrating equation deterministics: C
Coefficient covariance computed using default method
Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COC	-5.368428	2.964108	-1.811145	0.0742
FDI	0.694923	0.398242	1.744977	0.0852
GOV_EFF	-1.765460	3.163034	-0.558154	0.5784
INF	-0.128697	0.079492	-1.618987	0.1098
LIFE_EXP	-2.234549	0.433531	-5.154297	0.0000
PG	0.778078	1.444903	0.538498	0.5919
POL_STB	0.388852	1.144085	0.339880	0.7349
LANDA	8.738234	2.192438	3.985625	0.0002
VER	0.401129	0.293972	1.364516	0.1766

R-squared	0.987698	Mean dependent var	57.21611
Adjusted R-squared	0.985170	S.D. dependent var	23.49572
S.E. of regression	2.861308	Sum squared resid	597.6572
Long-run variance	8.301508		

Table 12

Dependent Variable: D(GREEN_GROWTH)
Method: ARDL
Date: 05/17/21 Time: 17:26
Sample: 2007 2015
Included observations: 106
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): INF FDI
Fixed regressors: C
Number of models evalulated: 6
Selected Model: ARDL(3, 2, 2)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
INF	17.27294	8.00354	2.158163	0.004
FDI	67.47828	25.2581	2.67155	0.002
Short Run Equation				
COINTEQ01	-0.049008	0.49233	-9.95427	0.0230
D(GREEN_GROWTH(-1))	0.258273	0.367821	0.702170	0.4849
D(GREEN_GROWTH(-2))	-0.411025	0.248063	-1.656941	0.1020
D(INF)	0.275630	0.353508	0.779700	0.4382
D(INF(-1))	0.074404	0.115440	0.644527	0.5213
D(FDI)	-1.786205	1.829252	-0.976467	0.3322
D(FDI(-1))	-2.573740	2.476544	-1.039247	0.3023
C	3.027945	4.319808	0.700944	0.4857
Log-likelihood	15.29163			

*Note: p-values and any subsequent tests do not account for model selection.

Table 13

Dependent Variable: D(GREEN_GROWTH)
Method: ARDL
Date: 05/17/21 Time: 17:28
Sample: 2000 2015
Included observations: 128
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LIFE_EXP PG
Fixed regressors: C
Number of models evalulated: 16
Selected Model: ARDL(4, 4, 4)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
LIFE_EXP	9.441304	29.49421	0.320107	0.7501
PG	-81.76809	236.2208	-0.346151	0.7306
Short Run Equation				
COINTEQ01	-0.025721	0.097602	-0.263530	0.7931
D(GREEN_GROWTH(-1))	-1.142968	0.193902	-5.894566	0.0000
D(GREEN_GROWTH(-2))	-0.838177	0.211566	-3.961777	0.0002
D(GREEN_GROWTH(-3))	-0.419027	0.154938	-2.704489	0.0091
D(LIFE_EXP)	176.5353	111.8393	1.578472	0.1203
D(LIFE_EXP(-1))	-243.5697	156.4842	-1.556513	0.1254
D(LIFE_EXP(-2))	-137.9728	241.6985	-0.570847	0.5705
D(LIFE_EXP(-3))	296.5580	319.6218	0.927840	0.3576
D(PG)	-19.10546	28.20261	-0.677436	0.5010
D(PG(-1))	25.56753	20.82684	1.227624	0.2249
D(PG(-2))	-39.41994	46.93433	-0.839896	0.4047
D(PG(-3))	2.745117	19.55908	0.140350	0.8889
C	-60.49234	52.03474	-1.162538	0.2501
Log likelihood	2.971704			

*Note: p-values and any subsequent tests do not account for model selection.

In the above-mentioned tables, the ARDL model is applied in its modified form. selection of the ARDL model was recommended by using the unit root test. As all the variables were not stationary at the level. Few of these show stationarity at the first difference, hence the ARDL

model is used to determine the long-run and short-run relation among the green growth and selected determinants. The analysis is performed on 128 observations, with auto selection maximum dependent lag.

To determine the optimal or auto lag selection of variables, the best-recommended model Akaike information criteria was applied. Akaike information criteria provide the optimum number of lags for individual variables. In E-views 10 there is an option to auto-select the optimal lag by mentioning the number of maximum lag for endogenous and exogenous variables. The maximum number of lags in this study is two, the annual data-set is used in this study so the number of maximum lags selected is two. In this study series, lag (4, 4, 4) is used because of the minimum Akai quality (Anwar, Aslam, & Yousaf, 2021).

5. CONCLUSION AND RECOMMENDATIONS

This study was conducted to assess the effect of economic, social, political, and geographical determinants on Green Growth among Asian Countries, by taking the secondary data from the year 2000 to 2015. The analysis portion provided that all the diagnostics and pre-requisite techniques are applied like normality, unit root, stationarity, and correlation. To determine whether diagnostic tests are suitable for data analysis and to apply, the normality of the data is determined by 99% confidence level using Jarque-bera, N-J Peron test is applied for stability due to the small number of observations. Stability at different levels establishes the sequence of integration between selected variables during the study period (Aqeel & Nishat, 2014). Akaike Information criteria provide the optimal number of lags for individual determinants, the maximum number of lags are two, as the data is annual. The ARDL model is applied to evaluate the long-term and short-term relationship between variables based on the unit's main result because the ARDL strategy is applied if the stable level of the variable is different. (Anwar, Aslam, & Yousaf, 2021). The results of the correlation show that the bi-directional relationship between the variables, most of the variables are positively correlated with green growth. As the term EC has been observed, marked here as quint aqu (-1), it is negative with the qualitative estimate of co0.746. This indicates that about 744% of the imperfections are changed over a period of time. In addition, a very large t-statistic value named -4.979 is given, indicating that the coefficient is very significant (Anwar, Aslam, & Yousaf, 2021).

5.1 Recommendations for future study

This research shows that there is a long-standing relationship between green development and selective determinants. Subsequently, for the future, a difference can be made among customary and green development improvement among various locales of the World. Also, more examinations will be went with utilizing some other fundamental factors, for example, exchange equilibrium and cash supply, work costs, productivity, and so on Also, it very well may be deduced later on the size of this connection can be evaluated (Anwar, Aslam, & Yousaf, 2021).

5.2 Policy Implication

The recommended policy implication for the study is to pay special attention toward Green Growth. As the traditional measure of economic development are significantly contributing toward environmental pollution, which results in unhealthy climate. Most of the develop countries and global level institutes are making and implementing the policies to promote the green growth.

Bibliography

Aldakhil, A. M., A.Nassani, A., Awan, U., Moinuddin, M., Abro, Q., & Zaman, K. (2018). Determinants of green logistics in BRICS countries: An integrated supply chain model for green business. *Journal of cleaner production, 195*(1), 861-868. doi:10.1016/j.jclepro.2018.05.248

Anwar, M. S., Aslam, Q., & Yousaf, H. (2021). Impact of selective macro-economic variables

on foreign direct investment: Pakistan perspective. *International Journal of Business Reflections, 1*(1), 1-30. Retrieved from http://111.68.103.26/journals/index.php/ijbr/article/view/2273/0

Bennett, P., & Green, R. (1972). Political instability as a determinant of direct foreign

investment in marketing. *Journal of Marketing Research, 9*(2), 182-186. doi:10.2307/3149952

Capasso, M., Hansen, T., Heiberg, J., Klitkou, A., & Steen, M. (2019). Green growth: A synthesis of scientific findings. *Technological Forecasting & Social Change, 146*, 390-402.

Chanegriha, M., Stewart, C., & Tsoukis, C. (2017). Identifying the robust economic, geographical and political determinants of FDI: an Extreme Bounds Analysis. *Empir Econ*, 759-776. doi:10.1007/s00181-016-1097-1

Chau, N. H., & Kanbur, R. (2018). The Past, Present and Future of Economic Development. In *Towards a new enlightenment? A tascendent decade* (pp. 1-18).

Chen, B. &. (1996). Some Political Determinants of Economic Growth: Theory and Empirical Implications. *European Journal of Political Economy, 12*, 609-627.

Dadhich, M., Purohit, H., & A.Bhasker, A. (2021). Determinants of green initiatives and operational performance for manufacturing SMEs. *Maaterialstoday proceedings, 1*(1). doi:10.1016/j.matpr.2021.01.889.

Fankhauser, S., Kazaglis, A., & Srivastav, S. (2017). Green growth opportunities for Asia. *Economics Working Paper Series*(508), pp. 1-37.

Hao, L.-N., Umar, M., Khan, Z., & Ali, W. (2021). Green growth and low carbon emission in G7 countries: How critical the network of environmental taxes, renewable energy and human capital is? *Science of The Total Environment, 752*(1), 1-15. doi:10.1016/j.scitotenv.2020.141853

Heshmati, A. (2014). An Empirical Survey of the Ramifications of a. *Discussion Paper Series*, 1-33.

Kruse, T., Mohnen, M., Pope, P., & Sato, M. (2020). Green revenues, profitability and market valuation: Evidence from a global firm level dataset. *Climate Change and the Environment, 331*, pp. 1-71.

Madni, G. R., Anwar, M. A., & Ahmad, N. (2021). Socio-economic Determinants of Environmental Performance in Developing Countries. *Journal of the Knowledge Economy*, 1-15. doi:10.1007/s13132-021-00775-0

Manzoor, R., & Samad, G. (2013). The sustainable green growth perspective of Pakistan: In the context of environment friendly technologies. *CEECC Working Paper*, pp. 1-18.

Norton, A., & Boer, Y. D. (2016). *Why social inclusion matters for green growth.* Retrieved from Green economy coalition: https://www.greeneconomycoalition.org/news-analysis/why-social-inclusion-matters-green-growth

OECD. (2019). *Innovative renewable energy.* Springer.

Owusu, A. (2015). *Problems in the design and implementation of GIS for urban green development in Ghana.* Retrieved from Electronic Thesis or Dissertation:

https://etd.ohiolink.edu/apexprod/rws_olink/r/1501/10?p10_etd_subid=58925&clear=10#abstract-files

Qin, X., Wang, X., Xu, Y., & Wei, Y. (2019). Exploring driving forces of green growth: empirical analysis on China's iron and steel industry. *Sustainability, 11*, 1-11.

Qin, X., Wang, X., Xu, Y., & Wei, Y. (2019). Exploring Driving Forces of Green Growth: Empirical Analysis on China's Iron and Steel Industry. *Sustainability , 11*, 1-11.

Root , F., & Ahmed, A. (1979). Empirical determinants of manufacturing direct foreign investment in developing countries. *Economic Development and Cultural Change, 27*(4), 751-767. doi:DOI: 10.2307/1153569

Samad, G., & Manzoor, R. (2015). Green growth: Important determinants. *The Singapore Economic Review, 60*, 1-15.

Shah, S. H., Ahmad, M. H., & Ahmed, Q. M. (2015). The nexus between sectoral FDI and institutional quality: empirical evidence from Pakistan. *Applied Economics*, *48*(1), 1–12. https://doi.org/10.1080/00036846.2015.1103039

Shi, J. (2019). Vertical FDI and exchange rates over the business cycle: The welfare implications of openness to FDI. *Journal of Development Economics*, *138*, 1–51. https://doi.org/10.1016/j.jdeveco.2019.01.004

Simionescu, M. (2016). the Relation Between Economic Growth and Foreign Direct Investment During the Economic Crisis in the European Union. *Zbornik radova Ekonomskog Fakulteta u Rijeci: Časopis Za Ekonomsku Teoriju I Praksu / Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business*, *34*(1), 187–213. https://doi.org/10.18045/zbefri.2016.1.187

Schneider, R., & Frey, B. (1985). Economic and political determinants of foreign direct investment. *World Development, 13*(2), 161-175.

Tan, B. W., & Tang, C. F. (2016). Examining the Causal Linkages among Domestic Investment, FDI, Trade, Interest Rate and Economic Growth in ASEAN-5 Countries. International Journal of Economics and Financial Issues, 6(1), 214–220

Umar, M., Ji, X., Kirikkaleli, D., & Xu, Q. (2020). COP21 Roadmap: Do innovation, financial development, and transportation infrastructure matter for environmental sustainability in China? *Journal of Environmental Management, 271*. doi:https://doi.org/10.1016/j.jenvman.2020.111026

Wang, K.-H., Umar, M., Akram, R., & Caglar, E. (2021). Is technological innovation making world "Greener"? An evidence from changing growth story of China. *Technological Forecasting & Social Change, 165*(1), 1-8. doi:10.1016/j.techfore.2020.120516

Yue, S., Yang, Y., & Hu, Y. (2016). Does Foreign Direct Investment Affect Green Growth? Evidence from China's Experience. *Sustainability, 8*(158), 1-14. doi:doi:10.3390/su8020158