



NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
DEPARTMENT OF BUSINESS ADMINISTRATION

Financial Development and Green Growth: Evidence from highest green growth OECD Countries

MBA THESIS

Ali GHANAVATI

Nicosia

January, 2023

ALI GHANAVATI

**Financial Development and Green
Growth: Evidence from highest
green growth OECD Countries**

MASTER THESIS

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Supervisor
Prof. Dr. Aliya IŞIKSAL

**Nicosia
January, 2023**

Approval

We certify that we have read the thesis submitted by Ali Ghanavati titled “**Financial Development and Green Growth: Evidence from highest green growth OECD Countries**” and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

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Declaration

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Ali Ghanavati

30/01/2023

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Ali Ghanavati

Abstract**Financial Development and Green Growth: Evidence from highest green growth OECD Countries****Ali Ghanavati****Supervisor: Prof. Dr. Aliya Işıksal****MBA, Department of Business Administration****January, 2023, Page 78**

By investigating many articles it is obvious that a lot of researchers worked on Renewable Energies, Human Capital, Financial Development, Ecological Footprint and their effect on green growth. However, there is no sufficient research about investigating Banking Sector effect on green growth(GG) in OECD. So, this thesis examine the link between variables such as renewable energy consumption or in short (REC) and technology(RET), human capital development(HCD), ecological footprint(EFT), and (FD) which is stand for financial development in OECD countries and focus on banking sector development effect on green growth in mentioned countries, by using some tests like, unit root test(URT), Pooled Mean Group in short (PMG) , (MG) that is stand for mean group, and also dynamic fixed effects or in short (DFE) and the last one is Dumitrescu and Hurlin test or in short (DH) causality from 2010 to 2020. The results that is derivation from the PMG-ARDL method indicated that human capital development and other variables like FD, EFT can cause positive and significant efficacy on GG in the running in the long period. But except the FD and EFP in running at short term HCD has not significant positive effect on GG. On the other hand, resultant of the causality test illustrated that HCD, FD and EFT have a two ways causality relationship with green growth but renewable energy consumption has just one-way relationship.

Key Words: Banking Sector Development, Green Growth, Pooled Mean Group, OECD Countries, Unit Root Test

Özet

Finansal Gelişme ve Yeşil Büyüme: OECD Ülkelerindeki en yüksek yeşil büyümeden elde edilen kanıtlar

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Yenilenebilir Enerjiler, Beşeri Sermaye, Finansal Gelişme, Ekolojik Ayak İzi ve bunların yeşil büyümeye etkileri üzerine pek çok araştırmacının çalıştığı birçok makale incelendiğinde görülmektedir. Ancak OECD'de Bankacılık Sektörünün yeşil büyüme (GG) üzerindeki etkisini araştıran yeterli araştırma bulunmamaktadır. Bu nedenle, bu tez, yenilenebilir enerji tüketimi veya kısaca (REC) ile teknoloji (RET), insan sermayesi gelişimi (HCD), ekolojik ayak izi (EFT) ve finansal gelişmenin kısaltması olan (FD) gibi değişkenler arasındaki bağlantıyı incelemektedir. Birim kök testi (URT), kısaca Pooled Mean Group (PMG) , (MG) ve ortalama grubu temsil eden (MG) gibi bazı testler kullanılarak OECD ülkeleri ve söz konusu ülkelerdeki yeşil büyüme üzerindeki bankacılık sektörü gelişiminin etkisine odaklanma ve ayrıca dinamik sabit etkiler veya kısaca (DFE) ve sonucusu Dumitrescu ve Hurlin testi veya kısaca (DH) 2010'dan 2020'ye nedensellik. FD, EFT, uzun dönemde GG üzerinde koşuda pozitif ve anlamlı etkinliğe neden olabilir. Ancak kısa süreli HCD'de FD ve EFP dışında, GG üzerinde önemli bir pozitif etkisi yoktur. Öte yandan, nedensellik testinin sonucu, HCD, FD ve EFT'nin yeşil büyüme ile iki yönlü bir nedensellik ilişkisine sahip olduğunu, ancak yenilenebilir enerji tüketiminin sadece tek yönlü bir ilişkiye sahip olduğunu gösterdi.

Anahtar Kelimeler: Bankacılık Sektörü Gelişimi, Yeşil Büyüme, Havuzlanmış Ortalama Grup, OECD Ülkeleri, Birim Kök Testi

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List of Abbreviations

GG:	Green Growth
FD:	Financial development
RE:	Renewable Energy
REC:	Renewable Energy Consumption
RET:	Renewable Energy Technology
HCD:	Human Capital Development
GGGI:	Global Green Growth Institute
OECD:	Organization for Economic Cooperation and Development
EFT:	Ecological Footprint
PMG:	Pooled Mean Group
MG:	Mean Group
DFE:	Dynamic Fixed effect
DH:	Dumitrescu and Hurlin
URT:	Unit Root Test
R&D:	Research and Development
ARDL:	Autoregressive Distributed Lag Model
WCT:	Westerlund Co-integration Test
CADF:	Covariate Augmented Dickey-Fuller Test
CIPS:	Cross-Sectionally Augmented Panel Unit Root Test

CHAPTER I

Introduction

In first chapter, first we will be familiar with green growth, then we will get some knowledge about the variables that chose for this topic, also we will see the importance of each of them and according to the definitions the reason of using them will explain. Also the reason of using the OECD countries and choosing this topic will mention.

Green growth means economic growth combined with environmental sustainability. This definition is based on the premise that if economic growth is considered as a goal that is more important, the use of resources and adverse environmental effects should be separated from economic growth. Therefore, GG is closely related to green economy and lower carbon generation and also tolerable development. The main factor in achieving green growth can be considered to be less use of non-renewable and fossil energies, moving towards the use of sustainable energy systems. Those who support green growth policies in different countries have the argument that if green policies are implemented well, we can witness the creation of many job opportunities in the renewable energies area, green agriculture or sustainable forestry and other fields.

Many countries, as well as some organizations, for instance OECD which is stand for Organization for Economic Co-operation and Development or in short, also an important organization in this way is the United Nations, have provided solutions on green growth, or more than that, an institution called the Global Green Growth Institute or in short (GGGI). It specifically deals with this issue and its solutions. The term green growth is used to describe systematic solutions at the national or international level.

Green growth also faces criticisms. Its critics state that how green growth strategies do not take into account environmental destruction and also the changes in economic systems needed to solve the climate crisis and some other crises. They also consider alternative frameworks for Economic changes such as the circular economy, degrowth, similar radical changes suggest that they offer better capabilities and efficiency.

To illustrate the efficacy of banking sector on green growth(GG) there are some variable that we consider. These variables are:

1-Renewable Energy Technology

Renewable energy technologies or RET include a lot of sources like solar, water, biomass, wind and etc. which help us to produce energy. This is which is produce by renewable energy sources is clean and helpful. In four corner of world, lots of countries, used renewable energy to reach a constant amount of energy request. The fast and significant progress of using the renewable energy in recent years is an important policy in all regions and countries and it has a very close relationship with the business departments, also innovations in technology. The cost with using these technological innovations in renewable energy area will reduce. The merits of renewable energy are a lot and they can have effects on the economy, environment, and so on. Here are some of the benefits of using renewable energy:

- Increment reliability, security of the power grid
- Increasing the Job opportunities
- Decreasing CO2 emissions and pollution in air from energy production
- Increasing the energy independence in all countries
- Decreasing the cost of energy in long term

2-Renewable energy consumption

REC is the proportion of energy which is utilized from renewable sources to the total usage of energy from all sources in one year, there is no matter they are in the group renewable or in the other group which is non-renewable. that is mentioned as the total gross domestic consumption of energy that is reach from renewable sources.

3-Human Capital

If we want to have a definition of human capital, we should say that this concept is a set of knowledge, skills and health that people spend for during their life so that these things can be used as productive and dynamic people in the world. Society benefited. All of these matters have an effect on their independence and income level, so that the more they invest in children, the more productive they will be in adulthood.

Robert Gibbons, an economist at MIT University, used a new concept for human capital in 2004. According to his theory, human capital also depends on work, and the more this investment is in the field that the company needs, the more it is. The company values this investment more, in fact, it has a greater effect on the individual's

income and dynamics. Human capital is one of the issues that companies by investing on education and training can increment the efficiency.

4-Financial development

Financial development is part of development strategy in private sections to reach growth in economy and decrease poverty in developing and emerging countries . The financial section contain some parts like markets, instruments and institutions. Also the legal and regulatory components are part of financial that permits by using credits transactions to be made. In general, financial development related to dominating "costs" imposed in the financial system. This process contain decreasing costs of reaching information, executing contracts, and performing transactions which effect on making financial contracts, psychics, and marketplaces.

Financial development will happen when instruments, marketplaces, and psychics related to financial system work with each other to decrease the expenses of information, implement and dealing. A powerful and great-functioning financial section is a strong engine which can create economic growth. It produce savings, can create productive enterprises in business. So the financial part provides the preliminaries for growing incomes and creating job.

5-Ecological footprint

The EFT is a way promulgated by the universal network of Footprint. It used to measure people requirements on innate capital, for instance the number of matter that should patronage human and economy. That follows the request in an accountancy system which is ecological. The reports contrast the biologically generative area people use for their utilization to the biologically generative area available within a zone or globally. In other words, it is a measure of people effect on the environment.

EFT examination is commonly utilized to support the sustainability of assessments in four corners of the world. by using that people can measure the use of resources and also manage them in economy and probe the supportability of exclusive lifestyles, commodities and also services, infrastructures, industry part, vicinities, towns, zones and countries.

Based on the information that mentioned above and by researching on other topics that other researchers it was significant that other researchers didn't focus on efficacy of banking sector and other variables specifically on GG so in this thesis by combination of all variables (HCD), (REC), (RET), (FD) (EFT) their effect on GG examined and for this purpose we used OECD countries as goal countries.

Also because of this reason this topic chose to focus on that and prepare more useful information in this area.

OECD is an organization and their aim is create good policies for better life. This organization include countries from all over the world and we chose this countries as goal countries because other researchers did not investigate them in their research but for this purpose just the countries with high level of green growth in OECD chose.

Research Question

By investigating other researches and also by considering the gap that other researchers did them before two main questions are the research questions those are important to focus on them in this thesis.

What is the inscription of banking sector in green growth?

What is the effect of financial development on green growth?

Hypotheses

Hypothesis one: Consuming the Renewable energy (REC) has a positive effect on green growth

Hypothesis two: Innovation in technology related to renewable energy (RET) has a negative effect on green growth

Hypothesis three: Ecological footprint (EFT) has a positive effect on green growth

Hypothesis four: Human capital development (HCD) will cause a positive effect on green growth

Hypothesis five: Financial development (FD) has a positive effect on green growth

CHAPTER II

Literature review

To make four subsamples of interconnected nations all over the planet, Wesley Longhofer and Andrew Jorgenson utilized network centrality and nongovernmental information from the global climate. Wesley Longhofer and Andrew Jorgenson analyzed the connection between the financial turn of events for two-way impacts samples to focus on the improvement effect on fossil fuel by-products for four subsamples. The outcome was that nations that were more coordinated into the worldwide ecological local area experienced unassuming decreases in fossil fuel by products over the long haul because of advancement.

The impact of correspondence data and innovation on carbon dioxide output was investigated by Ahmed based on 9 Asian countries that had the largest part of Asian lands during the period from 1990 to 2018. All past examinations show that the connection among data and correspondence innovation and CO₂ discharges is a balanced one. The quantity of nations where information and communications technology (ICT) fundamentally affects CO₂ discharges has not changed essentially in the direct and nonlinear models. Nonetheless, the deviation of the transient impacts of expanded and diminished utilization of information and communications technology is affirmed in close to almost the half of nations, the uneven effects are additionally enhanced within the engagement part of the nations.

Mei Wang and others utilize the super-SBM-ML model to evaluate green absolute component efficiency (GTFP) in view of Chinese common board information from 2000-2018, separating human resources into those with scholastic schooling and those with non-scholarly training, after that, they used Dubin's spatial model to evaluate the relationship between green absolute component efficiency and scientific and educational progress and finally human resources. At long last, Mei Wang and others showed the way that instructive human resources can adjust the impacts of innovative advancement, information overflows, modern overhauling, and ecological guideline on GTFP.

Weiping Huang and others by using data which created between 1990 to 2019 concentrated on the nonlinear impacts of human-utilized sustainable power and its exchange with one another on CO₂ utilization the Pakistani economy, and utilized the nonlinear autoregressive distributive slack (NARDL) method to assess the nonlinear effects of environmentally friendly power on CO₂ utilization. The outcome is that

there is a deviation in the utilization based CO₂ relationship with sustainable power utilization and exchange. The positive shocks in environmentally friendly power utilization (oil and gas) and the negative shocks in exchange increment utilization based CO₂ discharges. Satbyul Stella Kim and others utilized an OECD structure to choose a bunch of 12 pointers created for crosscountry correlations of green development procedures. These pointers are evaluated for 30 nations, including South Korea. The creators presumed that the files for normal capital and personal satisfaction in South Korea are somewhat high, however the scores for monetary action (creation, utilization, and exchange) are moderately low, and creation and utilization processes should be made all the more ecologically and financially manageable.

Zeeshan Khan and his associates analyzed the common inquiry in ongoing many years of whether normal assets improve or cheapen financial execution. To do as such, the creators inspected board information for Gathering of Seven economies from 1990 to 2020. They additionally analyzed the impact of environmentally friendly power utilization, the political gamble record, and gross capital development. Ordinariness tests uncovered that all factors follow a non-typical or non-parametric dispersion. Thus, Zeeshan Khan and others brought up significant measures for strategy creators connected with manageable utilization of clean energy venture, normal assets, political framework steadiness, and advancement of gross capital development.

Thanh Ngo et al. gave basic bits of knowledge into the current writing on environmental change, climate, and maintainability. Following the observational discoveries, they gave significant experiences to controllers, policymakers, and associations in analyzing the vital commitments of monetary turn of events, including monetary business sectors and monetary foundations, whose availability, profundity, and productivity need careful thought considering the SDGs and relieving the effects of environmental change globally. Nasir Mahmood et al. exactly analyzed the connection between ecological guidelines and green development, taking into account green licenses, green charges, the human resources file, sustainable power utilization, and financial development with expanded intermediaries for contamination emanations. They highlighted the natural financial matters writing that such eco-charges advance green development with monetary advantages, yet additionally support maintainability rehearses among people and firms, and suggest that OECD nations center around advancing eco-charges and eco-advancement as a proficient and

successful strategy instrument, and offer with fewer. Xiaoling Wang and Qinglong Shao joined a half breed measure with the worldwide Malmquist-Luenberger record to gauge public green development levels. A board limit relapse method is used for noticing the non-linear efficacy of formal and casual guidelines on GG in the twenty countries in the gathering over the period 2001-2015. The outcome shows that for the formal natural guidelines addressed by the Ecological Approach Severity (EPS), the market-based EPS is huge just in the high stage, while this isn't true in the low stage; the non-market-based EPS gave critical indications in every one of the three phases, however with various coefficients and importance levels.

Danish and Recep Ulucak analyzed the job of ecological advances in green development by controlling for sustainable and non-environmentally friendly power utilization for BRICS nations. To this end, the creators applied progressed board information assessment methods that yielded powerful outcomes with regards to endogeneity, heteroskedasticity, and cross-sectional reliance, and ecological innovations contribute decidedly to green development. Their outcomes additionally affirm that sustainable power advances green development, however non-sustainable power is negative to green development. BRICS nations need to further develop advancement in the energy area to accomplish green development and maintainability objectives.

Lin-Na Hao et al dissected the job of green development in advancing a feasible climate and inspected the job of earth changed multifactorial efficiency development for CO₂ outputs for G7 countries during the period of 1991 to 2017. The creators information utilized second level board techniques, (CSARDL) method which means cross-sectionally expanded auto-backward distributive slack. The consequences of the hypothetical and experimental discoveries show that both the direct and nonlinear green development terms diminish CO₂ outflows. Natural duties, human resources, and sustainable power use additionally lessen CO₂ discharges. The outcome upholds the hypothetical idea that green development keeps up with ecological quality. In 2018, Rubayyat Hashmi and Khorshed Alam inspected the effect of ecological guideline and advancement on lessening fossil fuel byproducts of OECD nations over the period 1999-2014. This study fosters another model called "stochastic effect through relapse on populace, abundance, guideline, and innovation" (STIRPART) to stretch out the examination to assess the variables influencing carbon

emissions. The results show that an expansion in green licenses diminishes fossil fuel byproducts and increments natural expense incomes per capita.

In 2012, John M. Reilly had the option to show what asset shortage and natural debasement mean for the economy and how endeavors to diminish the effect of these ecological and asset imperatives could work on financial development and execution. Input table factors and high-level accounting social networks and accounts that are related to public payments are known as reasons for conventional computable general harmony models. Thus, cautious thoughtfulness regarding the extension of public pay and item accounts (NIPA), which is turning into a standard piece of government factual workplaces' endeavors, would work on the reason for dissecting potential "green development" strategies and measures. the DEA-SBM method and the GML file to gauge the proficiency innovation in green sector development was investigated In 2020, by Chengchao Lv and others in 30 regions in China during the period of 2003 to 2017. This issue utilizes monetary construction, monetary scale and monetary effectiveness to depict the amount of financial turnover of events, and investigates the connection between monetary turn of events of innovation in green sector advancement. At last, there is an incorporated limit job that natural guideline has between monetary turn of events, development execution of innovation in green sector advancement.

The complete relationship between the optimal efficiency of energy and human resources and the progress and expansion of the financial sector was researched by Ahmed in 2020. These studies have been investigated in relation to China during the period 1971 to 2018. From the authors' point of view, a type of relationship called there is a convergence relationship between the factors of isolated energy and financial resources and the expansion of the financial sector, which was carried out by a test called the limit test, a limits testing attitude is going to apply while thinking about primary breaks. The assessed results affirm that these factors are coordinated. Human resources gathering affects a wide range of energy utilization. Subsequently, the connection between monetary development, messy energy utilization, and clean energy utilization stays associated. In 2022, Deliang Ache et all concentrated on the job of green venture and regular asset rents in advancing monetary consideration (FI) in China from 1990 to 2018. The creators utilized the QARDL model to beat the downsides of an ordinary model, for example, the ARDL model. Subsequently, they found that actions ought to be taken to start new undertakings, green venture, and

advance normal asset lease looking for conduct by controlling regular asset abuse and refining existing normal asset charge regulations in China. In 2022, Jiaqi Xu and others benefited from an attitude called the second level, which corresponds to the period from 1991 to 2014. In this regard, the authors used the unit root test. The strategy adopted mentioned that green growth heterogeneously affects monetary execution. The outcome is that green advancement is adversely related, while sustainable power utilization and normal assets are the main elements of financial execution of certain area.

Showcasing the most selected cases of green growth and wise guesses of OECD in European and Asian countries was researched by Martin Janicke in 2011. He follows the change of the green growth idea. Most importantly tackling these issues is about revolutionary development in naturally and asset effective advancements. In 2019, Yun Wang and others examined the severity of ecological administrative strategies and estimated green efficiency development utilizing a drawn out SBM-DDF approach. The powerful board relapse analyzes the effect and system of ecological arrangement rigidity on green efficiency development across modern areas in OECD nations. The fundamental outcomes are: (I) Watchman's speculation is affirmed that ecological strategies inside a specific degree of toughness decidedly affect green efficiency development; (ii) the effect becomes negative when natural administrative arrangements are rigid past a specific level, as the impact of consistence costs is higher than the impact of advancement pay.

In 2021, Fengsheng Chien and others analyzed the connection between green development and carbon lack of bias focuses with regards to the U.S., taking a gander at the job of natural development, ecological expenses, and efficient power energy. In this examination, the Quantile Autoregressive Circulated Slack (QARDL) technique was utilized because of its different benefits, for example, showing the causality designs in light of various quantiles for various factors like green development, green advancement, natural charges, and environmentally friendly power. With these interpretations, focusing on the results obtained from the transient assessment, the designers concluded that the positive parts of carbon dioxide depletion are implausibly associated with the upward trajectory of CO₂ that is currently underway. In 2021, Xiaoxiao Zhou and others perceived that monetary turn of events (FD) can advance energy and natural mechanical advancement, yet because of the altered U-formed relationship, financial turn of events and asset blessing, the efficacy of financial

development on ecological innovative advancement is not the same. Improper financial development going to be likewise block innovative advancement in green sector. The consequence of the edge model shows that as natural guidelines improve, the effect of energy and climate related mechanical advancement additionally increments. The advancement of green money under the Manageable Improvement Objectives (SDGs) is a significant driver of green mechanical advancement.

In 2015, Hancheng Dai and others assessed the monetary effects and natural co-advantages of enormous scope environmentally friendly power extension renewable energy by upcoming 50 years utilizing a unique general balance method and various power area upgrades in china country. The outcomes show that huge scope improvement of RE wouldn't have critical macroeconomic expenses. In actuality, it would have critical green development influences that would help the development of upstream enterprises, taking into account the change in different energy sectors, it causes a very wide optimal profit.

Assessed the efficacy of some financial area execution pointers (return on resources, market capitalization, resource quality, administration proficiency, and monetary soundness) on sustainable power utilization for a worldwide board of 124 nations was investigated by Franklin Amuakwa and others in 2021. The creators utilized a two-stage framework GMM board model to address likely endogeneity and sequential relationship. The outcomes show the significance of a well-working financial area to accomplish the sustainable power speculations expected to fulfill future energy need while lessening CO₂ discharges. In 2019, Yun Wang and others looked at the advancement patterns for development of green sector in developing countries, ozone harming substance moderation, and modern development in view of the estimation of green efficiency. The outcomes mentioned the point that some developing countries got potential of development in green sector. The creators think about three pathways for green development: direction to innovative leap forward, direction to energy saving and discharge decrease, direction to adjusted development for various OECD nations.

A research related to the measurement of progress in the field of green growth in different economic domains was conducted by Guangyou Zhou et al. in 2021. In addition, the authors prepared a comprehensive list to explore the impact of the financial sector system on green growth. Findings show the point fintech and green money essentially advance green monetary development. Simultaneously, the efficacy

of fintech on development which is green is exceptionally heterogeneous territorially, that is to say, the effect in eastern China is a lot more grounded than that in focal and western China.

In 2018, Wei Yin and others analyzed the effect of monetary advancement on natural debasement in China utilizing city-level information for the period 2007-2014, utilizing the apparently irrelevant relapse model (SUR). The outcomes show that monetary advancement adds to water quality improvement however prompts more SO₂ discharges in China. Specifically, the monetary advancement of China's significant urban areas expands the weight on air and water quality. Furthermore, urban areas with higher monetary area yield at the common level have lower SO₂ emanations and wastewater releases.

In 2019, Claudia Nyarko Mensah analyzed the effect of mechanical advancement on green development in 28 economies of the Association for Monetary Co-activity and Improvement from 2000-2014 considering OECD countries. These countries that were examined from an economic point of view are located in the Oceania continent. To refer to the tests, it should be stated that the starting tests are cross-sectional dependence and unit root test the positive effect of growth and promotion through the transportation sector on green growth was confirmed by the authors according to two STIRPT and IPAT methods. in the Oceania subregion. Thus, assembling and handling advances in the OECD Asia district emphatically affected green development. Environmental change advances connected with energy creation and transmission are negative to green development in OECD economies, however their effect is apparent in the districts of Asia continent and Europe continent. The point was expected that more likely comprehend the connection between way subordinate monetary development and solid venture driven development with regards to green financial execution by Seyyedmilad Talebzadehhosseini and Ivan Garibay in 2021. The creators build a model utilizing Incomplete Least Square - Primary Condition Displaying (PLS-SEM) to look at the connection among TI and green item improvement, in view of the speculation of way subordinate financial development, on Nations' General Green Development Execution (COGGP). That's what the outcome is, notwithstanding useful abilities, mechanical advancement (TI) is another variable that nations ought to consider while fostering their approach plans for delivering new green items. In view of these discoveries, the authors aimed some

arrangement estimates strategy for advance green growth in all of the countries all around the world.

In 2022, Gianhong Gao and others analyzed the spatial effect of monetary turn of events and mechanical development on for China nation utilizing SDM method for the period 2011-2018 in light of board information from 30 territories. Improving in green growth file estimated utilizing a technique which is called EWM. That's what the outcomes show: First, the improvement size of monetary organizations (lnFDS) in the neighborhood region affects nearby green development (GG), yet affects green development (GG) in encompassing areas. Second, the size of the securities exchange in the nearby region (lnSTO) significantly affects green development in both the neighborhood and encompassing areas.

In 2022, Ling Du et al concentrated on the effect of super advanced industry and environmentally friendly power on utilization related fossil fuel by products considering MINT countries. Economic expansion and foreign direct investment are two additional drivers of CCO₂ emissions that the authors take into consideration. It should be noted that some of the tests that the authors have used in their data panels include the unit root method of CADF and CIPS and the new multi-moment quantile regression method of MMQR and in addition to this it is important that the described methods are second generation. In the end, the authors realized that based on the amount of carbon dioxide distribution in the MINT countries, their economy is based on the industry sector and development and growth in the field of technology, as well as economic progress and focus on foreign investments.

There is a non-linear relationship between the progress in the economic field and the growth in the financial sector with the presence of institutional investors that include pension funds that was investigated in 2017 by Jose L.ying Ruiz. By examining the economic bank of more than a hundred countries, the author obtained results about countries with developing economies and countries with economies in the industrial sector by benefiting from the dynamic panel model. He discovered that nations above and below the finance threshold grow at a faster rate. Additionally, institutional investors have a significant efficacy in order to improve the conditions of GDP in industrialized economies.

Considering the available data, Jingjing Zeng et al. researched 3 factors of energy conservation and progress in the industrial sector and renewable energy based on more than 30 provinces in China during the period from 2007 to 2014. The effect

of the mentioned factors on green growth it was reviewed in the industry sector of China in 2019. In addition, it should be noted that focusing on renewable energy and the correct way of using existing energy has a much more impressive effect than trying to improve the extraction and use of fossil fuels. The authors concluded that it should aim to spread green growth in the industry sector to help improve these conditions.

The effect of two important factors, i.e. the effect of the all-round green growth process on progress in the tourism sector, was investigated by Xin Zhang et al. in 2021. Several provinces in China were investigated between 2010 and 2019.

Using data from eighty nations during the period of 1960 to 1989, Robert G. King and Ross Levine presented evidence for the year 1993 which was the same with the mentality of a person named Schumpeter. This idea and mentality was that the improvement of economic development is possible with the help of the financial sector, in other words, a correct financial system. The relationship between multilateral activities in the development of the financial system and production Gross domestic product and the productivity of physical capital are inevitable. Finally, it should be noted that economic growth and the design of a correct financial system are significantly dependent on each other.

Randall S. Jones and Byungseo Yoo set out to create a comprehensive cap-and-trade system that would be complemented in 2011, this is a problem while we should use industries that have less carbon production to improve greenhouse gas production instead of energy-intensive industries. In its Five-Year Plan, Korea intends to spend 1% of GDP each year through 2013. This is intended to encourage environmentally friendly growth. In addition to the mentioned cases, investing in the advancement of green technologies and ensuring the prevention of the risk of industrial damage is very effective. To realize the stated problems, the authors used two methods called ARDL and GMM. Dealing with the important issue of the effects of financial development on economic development was researched by Nongthymmai Shillong and colleagues. These studies were conducted on the basis of India during the period from 2003 to 2018. The findings based on the available data lead the authors to It concluded that focusing on expanding and improving the financial sector has very positive and significant effects on economic growth and development. As a consequence of this, the deepening of the financial sector ought to proceed to boost India's economic growth and establish India's competitive position in economic and financial development.

Deniz Koçak examined the effect of different factors on green growth. Some of these factors include the conditions and quality of life and the progress of the technology sector and the wide range of the environmental sector, etc. The methods by which the authors in 2020, through which the effects of variables on Green growth and its indicators were investigated by gray relational analysis and entropy method. The findings indicate that environmental technology and carbon dioxide emissions are extremely necessary to obtain sustainable global promotion, measuring global developments, and identifying opportunities and threats.

Using a multivariate panel data framework, the research related to the progress in the economy sector and how to optimally use renewable energy was done by Dilvin Tan and colleagues in 2020. During the period of 1990 to 2015, these studies were conducted based on the extent of trade for countries that have economic interaction with each other. Considering the effect of optimization of renewable energy consumption on green growth, the authors used the OLS model and finally they realized that the use of renewable energy has a positive effect on the development of the green economy.

Manzoor Ahmed and his colleagues wanted to find out how environmental technology and the banking industry affect green growth in 2022. To be more specific, the empirical evaluation of the study is carried out using the PMG-ARDL and CS-ARDL approaches. The results of the CS-ARDL and PMG-ARDL sensitivity analyses were conducted using the FMOLS and DOLS methods. The observations indicate that there is a significant effect of creativity in the environment sector on green growth in different time periods. The authors in this field found out that reaching the safe point of green growth requires the development of banking and relying on new technologies.

Klara Szita Toth summed up the main steps, outcomes, and roadblocks on the way to a green world economy in 2014. Although it is common knowledge that growth theories focus solely on the economic aspects of growth, they examine, analyze, and explain the phenomenon as well as the primary factors of development. As a result, obtaining an economy which is green alters the economy structure and is thought to have some economic benefits as well: GDP growth, an increase in environmental goods and services, and an increase in exports to developing nations (Cosbey, 2012). However, there are also some dangers.

Sana Ullah and colleagues investigated about deagriculturalization, economic growth, and CO₂ emissions in Pakistan using a nonlinear autoregressive distributed

lag (NARDL) model and a Granger causality attitude during the period 1975- 2018 in 2021. The authors came to the conclusion that Pakistan's asymmetric results differ from Pakistan's symmetric results. The asymmetric causality test demonstrates that CO₂ emissions has unidirectional asymmetric causality. Moreover, the authors emphasized the necessity for reforming agricultural sector practices to support economic growth and reduce carbon emissions. They also realized that these findings will be very helpful to Pakistan in developing appropriate policies.

The percentage of progress in the field of economy and the importance of the financial sector in such a way that they are analyzed and reviewed from the inside was done by Jeremy Greenwood and Boyan Jovanovic in 2022. This important issue should be noted that it is one of the most basic factors of the financial return of investment, so therefore, it can be said that focusing on the financial sector can definitely help green growth. In addition, it is evident that any growth will incur more costs according to the tools it needs. According to the Goldsmith-McKinnon-Shaw perspective on environmental development, financial intermediation and economic expansion are therefore inseparable. Additionally, the model generates a development cycle that is analogous to the Kuznets hypothesis. Consequently, when a nation moves from a primitive economy with slow growth to a developed economy with rapid growth, the wealth gap between the wealthy and the poor widens.

Junhao Zhong and Tinghui Li were able to research the clear influence of the financial sector and its expansion for several provinces of China by focusing on the spatial distribution method in 2020, Using the GML index based on SBM-DDF and the spatial Durbin model (SDM) during 1996-2015, the efficacy of FD on GTFP is reflected in the innovation that has been added to the SDM. The following are the outcomes: (1) the amount of GTFP for the provinces of China shows a U-shaped curve during the period 1996-2015. 2) The growth of the financial sector for different provinces of China supports GTFP through a channel of innovation, and it should be noted that the expansion and growth in the financial sector of different regions of China have a spatial spillover effect.

The development of a large part of collective parameter and single equation estimators was concluded by Ahmed in 2004 and based on the ADL method. Special treatment and focus on the AS method were carried out by the authors. The said model is one of the branches of It ADL. It is important that the raised issues have nothing to do with the dependent variable and its delay values. The generation of ADL and DOLS

estimator models is directly dependent on the general ADL and limited AS models. An attempt was made to find out the direct and indirect impact of GDP, renewable energy and human resources on the amount of carbon distribution in the short term in 2004. The method provided to the authors to obtain this information and research Helped is CSERDL. Accordingly, fundamental justification in higher fossil fuel by product considering designated countries in economy section consist of monetary development. Moreover, efficient power energy and human resources file are additionally helpful in bringing down the natural corruption for different periods of time assessment.

In 2022 Xushi Wei et all expected to track down the job of natural business in accomplishing feasible green improvement in arising Asian economies. Two distinct intermediaries of natural business are utilized in this examination containing power creation through environmentally friendly power for example atomic creations. The creators have applied ARDL-PMG. They understood the positive effect of power creation from sustainable monetary development in different periods of time. Subsequently, sustainable power creation makes green monetary development ascend.

In 2021 Beata Gavurova et all expected to dissect the improvement in OECD countries utilizing bunch of developing in green growth markers. The measurable methodology is utilized for distinguishing primary elements of green development improvement in double cross ranges. The made progress of the OECD nations toward the green development was estimated first for years 2000-2009 to the second period 2010-2019. Thus, the downfall of the mean populace openness on normal for developing nations is an impressive sign for natural insurance and general strength of developing populace.

In 2022 Xiaoyan Li et all they conducted research on the importance of modern education and communication on green growth independently based on the country of China and its provinces during the period of 1995-2020. These studies are based on the RDL method and considering measuring the intervals it is a different time for progress in the green growth sector. The authors came to the conclusion that the effectiveness of modern education on green development is definite and definite. Therefor monetary consideration is emphatically connected with green development in both long run and short run. Besides, sustainable power utilization is found to decidedly affect green development. The creators highlight the requirement for

strategies that advance human resources and ICT foundation as an approach to speeding up green development.

In 2022 Muhammad Asghar Khan and Raja Rehan expected to look at the impact of banking area execution markers (banks resources and return on resource) and monetary consideration on environmentally friendly power utilization, green development, and fossil fuel byproducts for the period 1995 to 2020 in china country utilizing the ARDL method. The creators understood that bank resources increment environmentally friendly power utilization and green development. While return on resources additionally increments green development and diminishes fossil fuel byproduct over the long haul. Monetary incorporation upgrades environmentally friendly power utilization and green development, checking CO₂ outflows. Thus Banking area execution and monetary incorporation affect environmentally friendly power utilization, green development, and carbon dioxside outflows.

In 2022 Zahid Hussain et all examined the impacts of green innovation and natural elements on developing which is green in high Gross domestic product countries for the period 2000-2020. Furthermore, it additionally tests the direct impacts from Gross domestic product on green development. To do as such, the creators utilize a high level econometric methodology. Thus, the impacts of energy utilization and discharges working together fall apart green development in nations and highest Gross domestic product nations ought to deal with their financial and natural exercises to expand how much green development that might safeguard the biological climate.

In 2013 C. Michael Lobby recognized three unique arrangements of ways to deal with understanding way of behaving regarding reasonable the travel industry versatility and utilization are: the utilitarian, social/mental and the frameworks of arrangement/institutional methodology. Each depends on various series of expectations on the variables that influence shopper maintainability conduct. These presumptions not just influence the choice of strategy instruments to change ways of behaving but at the same time are connected with various methods of administration. Subsequently each of the three unique approaches to moving toward customer conduct are expected if a practical change to the socio-mechanical arrangement of the travel industry portability is to be made promptly.

In 2006 Horace Herring and Robin Roy understood that simply elevating specialized advancement to increment energy effectiveness is probably not going to prompt decreased energy utilization and outflows. Frame results from an experimental

exploration project, 'Individuals focused eco-plan', which tries to distinguish the key impacting factors on shopper reception and compelling utilization of energy proficient items and systems etc. In specific it expects to recognize how purchasers might stay away from (or relieve) bounce back impacts and how makers, specialist co-ops and government could plan and elevate such items to accomplish their ideal natural advantages.

In 2021 Xi Lin et al concentrated on the effect of creative human resources on CO₂ discharges in China. The common board information of 30 Chinese areas from 2003 to 2017 is dissected utilizing the decent impact, customary least squares, and the framework summed up technique for minutes (SYS-GMM). The creators understood that imaginative human resources mitigates natural weakening in China. As the outcome Chinese monetary advancement will ultimately uphold ecological manageability in the event that China keeps on fostering its imaginative human resources and among the control factors, financial construction, populace thickness, and energy power animate natural corruption by expanding CO₂ emanations.

In 2022 Xiaoxue Liu et al examined the connection between human resources (HC) and green development (GG) in principle and show viewpoint. It builds a precise hypothetical structure. Moreover, that utilizes an information coverage investigation in a model which is called (DEA) in light of the non-outspread bearing interval capability (NDDF) to quantify green growth execution for 281 prefecture-level in china country urban communities for the period 2011-2019. Eventually, it exactly tests the speculation by utilizing an econometric model and Light GBM AI (ML) calculation. As a result, the authors found that human capital has a heterogeneous effect on green growth based on the local parts of China.

In 2014 GUGLIELMO MARIA CAPORALE et al. looks at the relationship between the trends in the financial sector of events and financial progress in these countries by assessing a unique board method from 1994 to 2007. The authors realized that currently the stock market has not reached enough growth and due to the lack of financial well-being, the commitment of this sector for progress and financial growth was limited and also more productive financial area is found to have sped up development.

In 2022 a file is created to evaluate the degree of common green development by utilizing five kinds of markers - monetary development, ecological contamination misfortune, fossil fuel byproducts misfortune, regular asset misfortune, and natural

and normal asset benefits by Jiaman Li et al. The creators utilized the SYS-GMM technique for investigating efficacy of exchange also environmentally friendly power development in green growth through utilizing information ordered in some areas in China country from 2007 to 2016. Subsequently, the positive venture impact, work impact.

In 2001 M. HASHEM PESARAN et al fostered another way to deal with the issue for testing the percentage of connection among reliant factor and some regressors, two arrangements of asymptotic basic qualities are given by the creators: one when all regressors are absolutely I_1 and the other on the off chance that all of them simply are arrangements for basic qualities.

In 2019 Sana Ullah et al planned to assess the connection between familiarity, advancement, and firm endurance. For these kind of investigations considering electrical companies in Pakistan country is accounted for Revealing some models for dissecting some overviews directed somewhere in the range of 2008 and 2017, thus, there is a huge connection between familiarity and the degree of development, firm endurance, and firm execution. Casualness affects firm-level advancement, firm endurance, and firm execution.

In 2003 Philippe Aghion et al presented a system for dissecting the job of monetary elements as a wellspring of unsteadiness in little open economies. Their essential model is a unique open economy model with a tradeable great delivered with capital and a country-explicit element. The creators likewise expect that organizations face acknowledging limitations, with the imperative being tight at a lower level of monetary turn of events. A fundamental ramification of this model is that economies at a half degree of monetary improvement are shakier than either exceptionally created or extremely immature economies. This is valid both as in brief shocks make huge and determined impacts and furthermore as these economies can show cycles. Thus, nations that are going through a period of monetary improvement might turn out to be more unsound in the short run.

Sana Ullah et al. realized the effects of green innovation, education and banking on green growth from 1996-2020 in China is positive, they used the ARDL method in 2022. Muhammad Asghar Khan and Raja Rehan (2022) found a positive effect of financial inclusion on green growth and they examined banking sector performance effects on green growth for china from 1995-2020 using ARDL model. Manzoor Ahmed et al. showed the positive impact of the stock market and the banking

sector on green growth using FMOLS and DOLS techniques in 2022. As the result banking sector and stock market have positive effects on green growth. In 2021 Dongyang Zhang et al. realized that the costs related to human resources and research in the direction of green energy have a positive effect on green growth. This research in the BRICS countries in the period of 2008-2018 using the generalized method of moments (GMM). Jianhong Cao et al. (2022) realized that the cooperation between financial development and innovation in the technology sector has a negative effect on green growth. The research was conducted based on the Spatial Durbin Model (SDM) and in the period of 2018-2011 in China. Farhan Ahmed et al. (2021) showed that financial development and institutional quality have a positive effect on promoting green economic growth in the long term. This research was conducted using FMOLS and DOLS models in South Asian countries. Junhao Zhong and Tinghui Li (2020) realized that strengthening financial development and environmentally friendly innovations have a positive effect on green growth. This research was conducted during the period of 1996-2015 based on the SBM-DDF and SDM model in China. The positive effect of improving the stability of the financial development sector and the technology sector in the integration stage on green growth was investigated by Jianhong Cao et al. (2021) using the (GMM) method. Jamiu Adetola Odugbesan et al. (2021) found that financial regulations have a positive effect on the economy and green growth. These studies were conducted during the period of 1996-2019 using the ARDL model and in Turkey.

Majid Ikram et al. (2021) concluded that the environment has an asymmetrical positive effect on green growth Based on the research and using the QARDL model. Munir Ahmad and Yiyun Wu (2022) realized that economic growth in the conditions of non-participation with environmental innovation has negative effects on green growth. This research was carried out during the period of 1990-2017 in OECD countries and using the Cross-Sectional Dependence (CSD) model. Athanasios Kampas et al. (2021) came to the conclusion that human pressure on environmental conditions has nothing to do with green growth and does not cause harmful effects on it. This research was conducted during the period of 1990-2016 in Poland. Dervis Kirikkaleli et al. (2020) showed that improving the quality and environmental conditions has a positive effect on green growth. This research was conducted in Turkey using the OLS model. The investigation of the issue that increasing the production of renewable resources and improving the financial sector has positive

effects on green growth was done by Ayoub Zeraibi et al. This research was conducted during the period of 1985-2016 in Southeast Asian countries and using the CS-ARDL model. Shauku Kihombo et al. (2021) discussed technological innovation and its effects on economic growth in West Asia from 1990 to 2017 for west Asia and middle east using GMM method. The study of the fact that technologies related to the environment have a positive effect on green growth was done by Lan Khanh Chu (2021). These studies were carried out for the period of 1990-2015 for OECD countries and using the CS-ARDL model. Daxu Liu et al. (2022) came to the conclusion that the use of the Internet and financial expansion and improvement of renewable energy conditions have a positive effect on green growth. This research was conducted for the period of 1991-2019 using the ARDL model in China. Yanmin Shi et al. (2020) found that reducing the ecological footprint has a positive effect on green growth and sustainable development. These findings were obtained for the period of 2000-2017 using the EF model in China. Mei Wang et al. (2021) found that human and educational capital has a positive effect on green growth. These findings were made for China during the period of 2000-2018 using SUPER-SBM-ML model. Thanh Ngo et al. used data from several countries and examined the two-way effects of financial development and green growth in 2022, and concluded that education costs and human capital have an effective role on sustainable development. Kai-Hua Wang et al. (2021) found out that the improvement of research and development and human capital has a positive effect on green growth. These studies were conducted during the period of 1990-2018 using the convergence approach and for China. Environmental regulations have positive effect on green growth, which were investigated by Nasir Mahmood et al. (2022), These studies were conducted during the period of 1994-2020 in OECD countries and using the ARDL model. Lin-Na Hao (2020) realized that environmental and human capital taxes have a positive effect on green growth. These studies were conducted based on the CSARDL model during the period of 1991-2017 and in the G7 countries. Jiapeng Gou (2021) found that educational human capital has a positive effect on green growth and they investigated the role of human capital on the green economy in China. In 2022 the relationship between GG and HC was investigated by Xiaoxue Liu using data envelopment analysis (DEA) model during 2011-2019 in China. Yu Qian et al. (2021) came to the conclusion that proper urban policies have a positive effect on green growth. The information is based on DID method during 2004-2017 for China. Xinyang Wang et al. (2022) investigated the use of all green factors

in order to measure the greenness of China's economy, they found that human capital and its structures have positive effects on green growth. These studies were conducted during the period of 2000-2017 and based on the SBM model. Bahareh Oryani et al. (2021) realized that the promotion and development of the renewable electricity production sector has a positive effect on green growth. These studies were conducted in Iran during the period of 1971-2015 according to the ARDL model. The investigation of the issue that investing in renewable energy and human capital has a positive effect on green growth was conducted by Muhammad Wasif Zafar et al. (2020). This research was conducted in OECD countries during the period of 1990-2015. Chengying Hua et al. (2020) came to the conclusion that the optimization of energy consumption and the emission of minimum emissions have a positive effect on green growth. These studies have been investigated using the TFN model in the south of China. Efficiency of renewable energy has positive effect on development of green economy. These studies were investigated for development countries using multivariate panel data and OLS model during the period of 1990-2015 by Dilvin Taskın et al. (2020). Lucia Janicka et al. (2020) discussed the integration of various economic factors with the environment and taking into account the lack of damage to the environmental conditions. In 2021 the concept of green growth, which is the main factor of sustainable development, was investigated by Suparjo Suparjo et al. using the OLS model, these studies were done during the period of 2015-2024 in Indonesia. Simplicio A Asongu and Nicholas M Odhiambo (2021) examined the impact of renewable energy efficiency on carbon dioxide distribution and green growth using OLS method in 39 sub-Saharan African countries. Dervis Kirikkaleli and Tomiwa Sunday Adebayo (2021) found out that the investment of public and private partnership in the sector of renewable energy efficiency has a positive effect on green growth. These studies were investigated during the period of 1990-2015 in India. Zubing Deng et al. (2021) investigated the effects of financial development on the efficiency of renewable energy and the improvement of the quality of ecological conditions during the period of 1991-2019 in BRICS countries using the NARDL-PMG model. Xiaoyan Li et al. (2022) investigated that renewable energy consumption is found to have a positive impact on green growth in China using the ARDL model from 1995-2020. Nguyen Hoang Tien et al. (2020) realized that barriers to the efficiency of renewable energy have a negative effect on green growth. These studies were conducted during 2011-2020 in Vietnam. Penny Mealy and Alexander

Teytelboym (2022) realized that by changing the industrial structure, it is possible to have a positive effect on green growth. The research has been done in OECD countries. Festus Fatai Adedoyin et al. (2020) came to the conclusion that substituting renewable energies instead of currently consumed energies in BRICS countries has a positive effect on green growth. These studies were conducted between 1990 and 2014 and using the ARDL model. Dongyang Zhang et al. (2021) found that production activities based on labor and technology development have a positive effect on green growth. These studies were conducted during the period of 2008-2018 in the BRICS countries and using the GMM model. Malin Song et al. (2020) found out that the decrease in GDP causes negative effects on green growth. These studies were conducted in China using the DDF model. Investigating the issue that investment in the renewable energy sector has a positive effect on green growth was done by Ephraim Bonah Agyekum et al. (2021). These studies were done using PESTLE analysis for the country of Ghana. Ahmed Bouraiou et al. (2020) came to the conclusion that focusing on renewable energy, especially solar energy, has a positive effect on the green growth of Algeria. Simone D'Alessandro et al. (2020) showed that radical social policies and less carbon emissions can have a positive effect on green growth, with the conducted investigations. Xiangfeng Ji et al. (2020) showed that financial decentralization and GDP have a positive effect on green growth. These studies are based on decentralized data of 7 countries, including Australia, Belgium, Austria, Canada, Germany, Spain, and Switzerland during the years 1990-2018 using The SLS model.

The similarity of the relationship between the natural qualitative percentage and the ability and patent rights of patents and brands in 2022 was investigated by Zubair Tanveer et al. These studies are for the period of 1990-2019 and based on the countries of Switzerland and Vietnam. DL benefited both directly and non-linearly. Based on the data obtained from the non-linear analysis, the two mentioned countries, Vietnam and Switzerland, are not symmetrical with each other in terms of mechanical development and quality of weather conditions. This point It should be mentioned that the negative shocks in the patent have negative effects, which is based on the country of Switzerland. It should also be mentioned the impact of negative shocks in the names or commercial brands sector on carbon dioxide discharge in the short term. In 2020 Dao Thi-Thieu Ha and Nga Thi Hoang utilized the GMM (Summed up Strategy for Minutes) procedure on unequal board information to break down the effect of the swapping scale system on monetary development in Asian nations from 1994 to 2016.

Observational outcomes recommend that a proper conversion scale system (feeble adaptability) will affect financial development in a similar heading. Thus, the review filled in as quantitative proof for nations in the Asian district to consider while choosing a reasonable strategy and a conversion scale system to accomplish high financial development.

In 2021 Muhammad Tariq Majeed et al examined the powerful impacts of monetary opportunity on financial development and the quality of air in Pakistan country from 1990 to 2019. The ARDL results recommend that monetary opportunity and different factors noticeably affect financial development and contamination in running in the short term. Notwithstanding, over the long haul, monetary freedom significantly mitigates air contamination through expansion shakiness increments emanations. Subsequently, a halfway amount of positive change in financial opportunity emphatically affects emanations for running in a short term and long term, when a change is not positive there is no tremendous efficacy of running in a short term and has adverse consequences running in the long term. Hence, monetary opportunity upholds financial exercises that, thusly, raise discharges in the environment.

In 2015 Simone Marsiglio broke down the ramifications of the travel industry exercises on monetary development and ecological resources, centering, particularly around little island nations. The creator fostered an adapted unique financial model where the travel industry is the trigger of the motivating force instrument prompting decreased exercises and monetary development. The essential thought is that sightseers pick the area to visit as per various variables (counting natural quality) which are impacted by inhabitants' decisions. Thus, the (reasonable) adjusted development way is the main practical balance, and along such a way utilization develops while ecological quality ascents, and in the event that travel industry specialization should be the pathway to improvement, the green-the travel industry should be advanced.

In 2013 Dinda, and Soumyananda proposed a hypothetical model of comprehensive green development. Paper investigations improvement component through which normal asset capital recovers (or if nothing else non-corrupt) and adds to monetary development. Environmental change is a danger to saving

Normal assets which is a vital useful capital in the economy and furthermore challenges financial improvement in the 21st 100 years. The new advancement

procedure is the comprehensive green development that leads towards a reasonable turn of events. Thus, Strategy creators ought to zero in on employability, recovery, and safeguarding of normal asset capital for supporting vocations in the economy.

In 2017 Armand Kasztelan introduced the issue of green development, another working methodology, that the OECD is at present chipping away at. Green development is viewed as a down-to-earth instrument for accomplishing the immortal goal, which is the feasible turn of events. The creator examines the reason for the concurrent working of the three "green" thoughts. Moreover, the authors mentioned GG-GE-SD method and another way for dealing with characterizing peculiarity of green growth. The findings show the conjunction of feasible advancement and green economy sector and green development are sensible because of reciprocal connections among the available ideas. In 2010 Tomoo Machiba surveyed the current comprehension development and a structure which characterizes the mentioned idea from three perspectives. The offering pattern is likewise design for realizing the advancement exercises in manageable creation also examine a few decent tries. Recent exercises are extremely assorted and are happening at various surfaces and measures. It is subsequently crucial to catch both gradual and fundamental (or revolutionary) kinds of eco-advancement dissimilar to most exact examinations around here.

In 2016 Mohsen Bahmani-Oskooee et al. thought to be the encounters of more than 50 Pakistan nations bringing in enterprises directly from United States from 1980 to 2014. We view that as right around ventures effected through conversion scale unpredictability for short period of time. Be that as it may, short-run impacts keep going into the long run exclusively in 26 trading enterprises and 18 bringing in ventures. Because of such disaggregation, we observe that each of the four huge sending out is impacted emphatically over the long haul to import ventures.

The financial exchange efficacy on GHG discharges researched by Yingjie Hu et al. in 2022. The authors found that the studies conducted on the effectiveness of renewable energy that is in line with environmental goals on carbon dioxide emissions were investigated with the help of the statistical data of the BRICS countries during the years 1990-2019. The board which automatically starts working reconciliation strategy utilized for checking harmony associations. This paper's outcomes have critical and powerful approach suggestions for advancing environmentally friendly power utilization sources to assist with lessening CO₂ outflows and guarantee practical monetary development in the BRICS countries. In 2021 Seyithan Ahmet Ates and

Kursad Derinkuyu assessed the green development execution countries which are in OECD group through considering a distance strategy and coordinating in financial and natural countries exhibitions at the same time. Utilizing a distance attitude, chose development pointers and various factors have been blended into one worth. As per the creators' investigation, some European countries possess best spots for the extraordinary execution. In the end, three countries, Greece, Poland and Mexico, are placed in the base due to their poor performance in the environmental field.

In 2021 Benhong Peng et al. meant to decide the effect of monetary advancement on the green environment to advance cleaner creation The authors were able to determine and examine the effectiveness of the financial sector on environmental conditions based on the progress of the characteristics of the green environment in a part of China and with the help of the tracking model. The review results in pressure that the ventures ought to reinforce the mechanical advancement to improve asset use effectiveness and decrease of contamination.

In 2020 Sana Ullah et all gave a development cycle of the electrical fittings modern group in Pakistan by utilizing 2 times review. The authors realized that the group of Sargodha was wealthy through the key to diverse undertaking developments. Next significant objective is to dealt with inner and outside issues at the group level. This concentrate likewise derives that the Pakistan bunch has confronted endurance and development challenges over the most recent couple of years. Thus, the public authority ought to make the climate amicable for SMEs to work actually by working on modern bunches.

In 2018 Rongyan Liu et all expected to impartially distinguish the efficacy in green growth specially in green financial sector considering the improving economy of china nation, in addition to this, the author was able to come to the conclusion that progress in the field of green financial growth can be controlled with the help of public authorities and be effective in terms of the financial sector to bring society to green financial growth. Likewise, different effects from per capita Gross domestic product and modern construction effectiveness to environmental proficiency are measurably critical. Through building a record framework and a superefficiency slack-based model, the creators measure the degree of green monetary turn of events and local environmental effectiveness, individually, for Chinese 30 regions somewhere in the range of 2010 and 2015. Accordingly, there are critical local contrasts in the effects of green monetary advancement on natural proficiency.

The research related to the growth effects of environmental changes on green growth based on the existence of an assembly of European countries between 2000 and 2017 was examined by Misbah Nosheen et al. in 2021. In this regard, the authors used EPAT models and the Westerlund convergence approach. The conclusions made show that the new changes in the environmental field, if they have a direct connection with the energy sector, will help green growth, if there should arise an occurrence of the STRIP AT model, a climate-related financial plans will in general good affect green development.

In 2021 Bo Yang et all analyzed the effect of settlement inflows, mechanical advancements, and monetary improvement on natural development considering BRICS countries during the period 1990-2016. The authors utilized an extensive climate intermediary, i.e., biological impression for natural quality, and furthermore considers further developed and hearty econometric (second-age) procedures. Subsequently, settlement inflows and monetary improvement fundamentally decay the natural quality, while mechanical developments are a fundamental variable for the decrease of biological impression level and the consequences of the communication terms show a huge unfavorable impact on the environmental impression.

In 2021 Kazi Sohag et all meant to investigate the job of sustainable power, mechanical advancement, and especially the earth-harming militarization in driving green development, which cultivates reasonable financial development by guaranteeing the upsides of regular resources, taking into account OECD nations. Our assessment certifies a positive recommendation for the improvement of an environmentally friendly power, mechanical development, and green development. Creators likewise record a negative relationship between the genuine loan fee (RIR) and green development, while pay obfuscates the outcomes.

In 2021 Vincent Tawiah et all pre-owned information on 123 created and non-industrial nations to analyze factors that impact green development. The creators understood that monetary improvement decidedly impacts green development. Notwithstanding, exchange receptiveness is unfavorable to green development. With respect to related factors, we find energy utilization adversely influences green development, however environmentally friendly power utilization essentially works on green development. Subsequently, nations at an alternate improvement level will require various methodologies in accomplishing the Supportable Improvement Objectives in 2030. The outcomes are hearty to elective distinguishing proof

techniques, for example, the Framework Summed up Strategy for Development, which represents likely endogeneity.

In 2021 Jianhong Cao et al. concentrated on the effect of monetary turn of events and mechanical development on the unpredictability of green development utilizing a dynamic framework GMM strategy. That's what the creators understood: First, the development of monetary organizations' scale will fundamentally improve the unpredictability for developing in green growth. Expansion in scale of securities exchange going to likewise essentially create green growth variances. At the end cooperation in the monetary turn of events also mechanical development can essentially debilitate the unpredictability of green development. Accordingly, this study gives new proof to investigate advance strength and maintainable development in green growth for the exceptional phase of monetary and mechanical joining. In 2021 Muhammad Kamran Khan et all planned to investigate the ramifications of monetary turn of events, ecological related innovations, innovative work, energy power, sustainable power creation, regular asset exhaustion, considering maintainable climate in Canada nation by utilizing ARDL method reenactments. Subsequently, ecological-related advances help to diminish natural debasement in Canada country in different periods of time and monetary turn of events, energy force, sustainable power creation, innovative work, regular asset consumption, makes support the ecological corruption.

In 2021 inspecting human efficacy on carbon dioxide outflows considering BRICS countries during the period 1991-2019 was investigated by Xiaoyan Li and Sana Ullah, utilizing a board ADL methodology. The authors understood that if we can take steps towards the progress of the education sector, we will see a decrease in the output of carbon dioxide, while the increase in carbon dioxide emissions is based on the negative trend of the education sector in the long term and with the participation of the assembly. It is one of the BRICS member countries. As a result, it should be noted that the downward and negative trend in the education sector has reduced the rate of carbon dioxide discharge for China and Brazil. Subsequently, Policymakers ought to foster the schooling area framework to help the diminishing of CO₂ emanations.

In 2021 Wang Lei et all investigated the powerful effects of energy proficiency and sustainable power utilization on carbon dioxide emanations considering the period of 1991-2019 in the nation of China. Through utilizing ARDL attitude, the authors realized a negative change on productivity of energy decidedly affects CO₂ discharges

in the lengthy run. Moreover, environmentally friendly power utilization with positive shock essentially affects CO₂ emanations, however bad shock in environmentally friendly power utilization prompts increment contamination discharges in a lengthy run. Thus, positive shocks to energy proficiency and sustainable power utilization affect CO₂ emanations in the short run.

In 2022 Mingxiang Chen et al investigated the impacts of natural assessment and ecological severity strategy decreases in contamination discharges considering the country of china. The authors goaled a trailblazer of surveying the synchronous efficacy of the strategies on contamination discharges in the nation of China during the period 1993-2019. As exact examination, the review utilized NARDL assessment methods. Moreover, a positive change in ecological duty diminish N₂O, PM, CO₂, and GHGs outflows. Thus, positive shocks in natural arrangement toughness decreased CO₂, and GHGs, while negative shocks in ecological strategy severity expanded CO₂ discharges.

In 2022 Daxu Liu et al initially investigated the human resources efficacy on developing in green growth computerized the country of china in economy sector. For exploring the method exactly, the creators considered ARDL procedure during the period 1991 to 2019. They found out a growing efficacy in various degrees for training on green growth in China country. Subsequently, environmentally friendly power utilization, web use, and monetary improvement lead to an extension in green development. The results are able to reinforce a conviction for the governments in China nation on the progression of development.

In 2012 Michael Toman understood that basic presumptions implanted in different originations of Green Development work with the thought of how they may be deciphered versus standard standards of intertemporal monetary productivity, including the worth of the climate. Accordingly, A few conceivable potential channels are distinguished for how collaboration between monetary development and natural supportability may be greater than inferred by standard financial hypothesis.

In 2013 Jung Wan Lee and Michael Kwag examined the impact of the travel industry and cordiality industry on financial development and CO₂ discharges. The authors conducted a research in relation to a series of tests, one of which is the unit root test, based on different time periods in South Korea during the period 1970 to 2010. Other tests performed include the error correction model and the freezing test that the short-term and long-term periods of time analyzed the relationship between

the balance and implementation of the travel industry and the emptying of carbon dioxide and progress in the financial sector and other industries in the rest of the fields. According to the mentioned issues of the two industries which include travel and neighborhood have shown a very significant effect on the development and expansion of the financial sector in Korea, and this point is that focusing on various businesses has very negative and highly important effects on the increase in the level of It has carbon monoxide.

In 2021 Bjarne Steffen referenced that, the redirection of money streams is a vital target of the Paris Understanding, and nations have begun to establish strategies to impact monetary entertainers to this end. Nonetheless, straightforwardness on such arrangements is low, and it is not really imaginable to globally look at strategy action. To fill this hole, here the creator presents a relative examination of green monetary strategy yield in OECD nations from 2001 to 2019, in light of a recently ordered stock of 136 approaches from 29 nations and the European Association. The creator shows that arrangement yield sped up quickly since the Paris Understanding. As an outcome, there are colossal contrasts in strategy yield among nations, and a few nations that have significant monetary focuses have executed not many strategies to date. Based on our outcomes, we foster an exploration plan to extend the comprehension of this significant however little-concentrated area of environment strategies.

In 2020 Neng Shen et al consolidated sustainable power green development (REGI), fossil energy utilization (FEC), and air contamination into a brought-together examination system. Utilizing China's commonplace board information, a spatial estimation model was utilized to research the spatial impacts of environmentally friendly power green development and fossil energy utilization on air contamination in China from 2011 to 2017. As an outcome, the spatial connection of air contamination has slowly debilitated, while the worldwide relationship of environmentally friendly power green advancement and fossil energy utilization is expanding step by step.

To examine the effect of computerized comprehensive money and human resources on comprehensive green monetary improvement in China, In 2022 Junru Melody et al form an extensive pointer framework to quantify the degree of comprehensive green turn of events and utilize the super-proficiency SBM strategy to gauge the comprehensive green complete component efficiency (IGTFP) in Chinese urban communities, then, at that point, the framework GMM model is utilized to test

the immediate and intuitive impacts exactly. Subsequently, effect of computerized comprehensive monetary and human resources and their connections to comprehensive green improvement is investigated inside a brought-together structure, which has significant commonsense importance for the efficient advancement of the improvement of advanced comprehensive money, further developing occupants' schooling level and advancing comprehensive green turn of events.

In 2022 Muhammad Hafeez et al. meant to analyze the effect of eco-advancement and monetary proficiency on CO₂ emanations and sustainable power utilization in profoundly dirtied economy in Asian countries, which are China, India, Russia, and Japan. For observational examination, they considered the (ARDL-PMG) method. The findings assessed ecological advancements coefficient is decidedly huge in both sustainable power methods adversely critical in carbon dioxide discharges model. As an outcome, natural advancements assist with working with sustainable power utilization and lessen CO₂ emanations and the appraisals of monetary improvement are immaterial in both sustainable power and CO₂ outflows models.

Increasing the boundaries of the IGTU concept with the help of the entropy weight method was carried out in more than twenty-five regions of China during the period of 2006-2020. These studies were reviewed by Chanyuan Liu et al. in 2022. Moran's thickness measurement to display the sample. And for the effective spatial system, the spatial camera model was used. As a result, it should be pointed out that the separated effectiveness of its spatial consequences was analyzed with the help of the mentioned methods, district, asset gift, and ecological guideline is investigated further. As the outcome, the methods are consistently expanding, demonstrating the diminishing example for east and west in china nation. RETI essentially advances nearby IGTU yet hinders adjoining IGTU, framing a "mess up everything" circumstance. In 2018 Huimin Bi et al. constructed a powerful processable general balance for examining distinctions through development ways prompted using contrasts of characteristic specialized impetuses in carbon-reduction strategies in these conditions: charging carbon, blended strategy. Considering the condition of carbon market, albeit the transient carbon (C) alleviation impact is less noticeable, the twofold profit of outflows decrease and the GDP (Gross domestic product) development will occur over the long haul as per the Doorman speculation. Carbon charge prompts a somewhat emotional reduction in the development also beneficial outcome through

relief in carbon considering the short run; in any case, these impacts decrease over the long haul.

The efficacy of monetary improvement in absolute element efficiency for 40 nations over the period 1991 to 2014 was analyzed by Tinghui Li and Gaoke Liao in the year 2020. In particular, creators portrayed monetary advancement from the three parts of banking, protections, and protection. In emerging nations, a reversed U-formed relationship exists between the monetary turn of events and green complete variable efficiency, whether it is in bank improvement, protection advancement, or protection advancement. Subsequently, created nations, the improvement of bank and protection will in general unfavorably influence green complete component efficiency, while the improvement of protections emphatically affects green all-out factor efficiency. Protection advancement is more helpful for further developing green all-out factor efficiency than bank improvement.

In 2017 Manash Ranjan Gupta and Priya Brata Dutta fostered dynamic created method which exchanged great area also through exchanged travel industry administration area serving global vacationers. Income procured from the travel industry funds imports. The model deals with the adverse consequence of the travel industry's advancement on natural contamination. Natural quality and capital stock gather over the long haul. Thus, the travel industry improvement grows the percentage of capital stock that is same with public pay yet brings down the nature climate through consistent balance prompting an extension.

In 2004 Ransack A. Wilson and Geoff Briscoe This study surveys an enormous number of development models that endeavor to determine and measure the GNP and human asset relationship. The creators gave a top to bottom evaluation of a wide group of worldwide exploration that looks at the connections between schooling and preparing in a nation and its macroeconomic development. Accordingly, expanded interest in schooling is displayed to prompt higher efficiency and profit for the individual and comparably, such venture brings about huge social paces of return and it is reasoned that generally, the effect of interest in instruction and it is positive and important to prepare on public monetary development.

In 2020 Mahwish Zafar et al. have conveyed the genuine intention to examine the job of FDI, R &D, and exchange transparency on green monetary development of OECD nations. Created economies are open to unfamiliar direct speculation, and more liberal exchange strategies, and prepared to embrace mechanical advancements, all of

that cause to acquire quick natural changes in these countries and persistently expand the level of intensity in the air of these economies. Almost certainly these nations are accomplishing fast development at the elevated degrees of CO₂ in the air. Accordingly, this study is directed to distinguish the variables that can influence green financial development. Information is extricated from world improvement pointer from 1991-2015 where results portray that FDI and exchange receptiveness have a huge and positive relationship with the discharge of CO₂ in air and has a specific relationship with green financial development. By innovative work, the cost has a huge yet bad connection with the green development of the OECD nations.

As per the OECD (2011a), green development implies going to lengths helpful for development and financial turn of events, while guaranteeing that normal resources keep on giving the assets and natural administrations that add to the nation's success. The idea of green development is seen as a useful approach to accomplishing practical improvement in the long haul. In 2017 Kasztelan and Armand examined the degree of green development in chosen OECD nations. The research was completed in light of Hellwig's strategy, which empowered the development of an engineered proportion of "greening" of the development. It depends on markers connected with financial, social, and natural issues, as utilized in the OECD. The embraced technique made it conceivable to assess the concentrated peculiarity in general, giving grounds to allocating the chosen nations into four gatherings, described by comparable degrees of green development.

In 2022 Tan Chao et al analyzed the adequacy of mechanical development and monetary 32 organizations on environmentally friendly power utilization development in some nations through utilizing the CS-ARDL strategy during the period 1991-2019. The authors realized that, innovative advancement, monetary establishments are significant inexhaustible 35utilization in energy sector for some economies. Also, the results cleared the fact that mechanical advancement, 36 monetary establishments, training development considering the highest dirtying nations in economy sector and for long-run. Accordingly, the mentioned nations are required to further develop progress in new innovation also monetary establishments of 38 accomplishing development objectives.

In 2020 Rehmat Ali et al. meant to examine the job of the homegrown and unfamiliar monetary market in the assurance of Green Speculation for Pakistan. For economic development, checking the homegrown effects of financial strategy and

Gross domestic product with green investment is fundamental. While the conversion standard and FDI are utilized to look at the unfamiliar monetary effects on green ventures. The model accepts Green Speculation as a reliant variable while Wide cash, loan cost, Gross domestic product, unfamiliar direct venture, and conversion scale as the free factors. The information has been taken from global monetary measurements (Uncertainties) and world improvement pointers (WDI). The ARDL and blunder adjustment model (ECM) move toward has been utilized to individually figure out the relationship for different periods of time. As a result, money-related strategy factors, Gross domestic product, FDI, and reciprocal trade rates are critical.

CHAPTER III

Methodology

Research Design

As per all articles made by past specialists, we chose to utilize the ADF, CADF techniques in URT, Westerlund cointegration test(WCT), MG, PMG, DFE test, and Dumitrescu hurlin causality test. First and foremost, clarifications are given about every one of the strategies, and afterward, every one of the techniques is tried by the information we have. Furthermore, after that, you can track down the outcomes in the tables.

Toward the start, it ought to be expressed that the tests are partitioned into a few branches. One of these classifications is known as the unit root test. This strategy is utilized to gauge steadiness in a period series. For a superior to get it, it is important to specify that the root unit is a trademark for the insecurity of a period series. Deductively, it ought to be said that the base of the unit when alpha is equivalent to 1 is shown as follows:

The Expanded Dickey-Fuller test advanced in view of the above condition and is one of the most well-known types of Unit Root test. As the name recommends, the ADF test is an 'expanded' rendition of another test by name the Dickey-Fuller(DF). The ADF test extends the DF test condition for remind the great request backward cycle for the model.

Assuming that you notice, we have just added additional differencing terms, while the remainder of the situation continues as before. This adds more carefulness to the test. The invalid speculation anyway is as yet un-exchanged as the DF test. A serious matter to call-up is: Since an invalid speculation awaits the presentment of unit root, it means the value of $\alpha=1$, the p-esteem got must be not entirely the significant level (for instance 0.05) to reject the speculation that is not valid. Subsequently, it is fixed to deduce that the series. Notwithstanding, it is an acutely ordinary misstep examiner commit with mentioned test. So, if the p-esteem is not enough at the importance level, individuals mistakenly take the series to be non-fixed.

CADF technique in URT can be employed to resolve whether moving information must be first diversity or relapsed on deterministic components of time to render the information fixed. In addition, the monetary and finance hypothesis frequently recommends the presence of long-run balance correlations among non-stationary factors which are based on time series.

On the off chance that at least two series are exclusively coordinated (in the time series sense) yet some straight blend of them has a lower request of reconciliation, then the series are supposed to be co-integrated. A typical model is where the singular series are first-request coordinated ($I(1)$) yet some (co-integrating) vector of coefficients exists to frame a fixed direct mix of them. For example, a securities exchange record and the value of its related prospects contract travel through time, each generally following an irregular walk. Testing the speculation that there is a measurably huge association between the fates cost and the spot cost should now be possible by testing for the presence of a co-integrated blend of the two series.

Co-integration tests identify cases where at least two, time series that are not fixed are proportioned together, as a result, they can't deviate from the equilibrium in the running by long duration. The mentioned tests are utilized to identify the level of responsiveness of two factors to an alike typical cost over a predestined timeline.

Co-integration is a measurable property of an assortment (X_1, X_2, \dots, X_k) of time series factors. In the first place, the series should be all coordinated of request d (see Request of reconciliation). Then, in the event that a straight mix of this assortment is coordinated of requests not exactly d , then, at that point, the assortment is supposed to be co-coordinated. The utilization of board co-integration procedures to test for the tendance of long term junction ships across coordinated factors together with both a period series aspect, T , and a cross-sectional aspect, N , has gotten a lot of consideration as of late, particularly in observational writing.

According to the information, the time series panels are in the center of attention. Considering the formula, we realize that n is greater than T , and according to the mentioned issues, the time series is depicted. As a result, it should be noted that both N and T parameters are very massive.

it is clear that there is the capability to test the ordinal relationships, unit roots, co-integration, and Granger causality. The thought behind Granger causality(GC) is straightforward. At the same time, changes in the X_T variable cause changes in Y_T , and this means that X_T and Y_T have a direct relationship with each other. Finally, by utilizing the data in the range of $\{x_{t-1}, x_{t-2}, \dots\}$ we can estimate y_t

According to the given information, the following formula is used to check the negative or positive effects of X_T on Y_T :

$$y_t = c + \gamma_1 y_{t-1} + \gamma_2 y_{t-2} + \dots + \gamma_p y_{t-p} + \beta_1 x_{t-1} + \beta_2 x_{t-2} + \dots + \beta_p x_{t-p} + \epsilon_t$$

In this formula, ϵ_t performs the suspicions of being free and indistinguishably disseminated.

Null hypothesis: $\forall k \geq 1, \beta_k = 0$; it is clear that x_t could not cause y_t .

Alternative hypothesis: $\exists k \geq 1, \beta_k \neq 0$; x_t can cause y_t .

Albeit the conventional Granger causality test is just legitimate for fixed series, we specific, at whatever point something like one variable in the relapse above isn't set, the customary methodology is not substantial. So in the same situation, should follow the methodology of Toda et al which present in (1995). In addition, we mention the issue that non-stationary and at the same time non-co-integrating factors may show Granger causality. Positions that are not fixed momentarily in X_T and Y_T are very important.

Considering the information based on time series relates a cross-segment in the period of $1 < i < N$ for each time interval $1 < t < T$. Also, a characteristic expansion of the GC relapse (11) to cross-sectional data, would expect the structure:

$$y_{i,t} = c_i + \gamma_{i,1} y_{i,t-1} + \gamma_{i,2} y_{i,t-2} + \dots + \gamma_{i,p} y_{i,t-p} + \beta_{i,1} x_{i,t-1} + \beta_{i,2} x_{i,t-2} + \dots + \beta_{i,p} x_{i,t-p} + \epsilon_{i,t}$$

We require the underlying foundations of the trademark conditions

$1 - \gamma_{i,1} r_i - \gamma_{i,2} r_i^2 - \dots - \gamma_{i,p} r_i^p = 0$ for all values of N to be outside the unit circle. $\epsilon_{i,t}, \epsilon_{i,t}$ are autonomous and ordinarily disseminated in both I and t . The probability of cross-sectional reliance and ordinal relationship in all values of t is avoided.

Specifically: $H_0: \forall k \geq 1$ and $\forall i, \beta_{i,k} = 0$; $x_{i,t}$ doesn't Granger cause $y_{i,t}$, $\forall i$.

It should be kept in mind that in certain circumstances the presence of Granger causality is obvious. If presenting GC as causality in all the intersecting parts simultaneously, we will have this problem proposed:

First alternative hypothesis: $\forall k \geq 1$, and $\forall i, \beta_{i,k} \neq 0$; $x_{i,t}$ granger can cause $y_{i,t}$, $\forall i$

second alternative hypothesis: $\forall k \geq 1$ and $\forall i = 1, \dots, N_1, \beta_{i,k} = 0$; $x_{i,t}$ Granger cant cause $y_{i,t}$, $\forall i \leq N_1 \forall i = N_1 + 1, \dots, N$, $\exists k \geq 1, \beta_{i,k} \neq 0$; $x_{i,t}$ Granger can create $y_{i,t}$ for all values of $i > N_1$.

Where $0 \leq N_1/N < 10 \leq N_1/N < 1$. Since H_{A1} is clearly prohibitive, we center here around H_{A2} . The hypothesis of the GC board test in which the first hypothesis is different from the second alternative hypothesis introduced method by Dumitrescu and Hurlin (DH,2012). The methodology followed up seriously created by Pesaran et al (2003) for heterogeneous boards.

It is critical to comment here that albeit one might notice $t=1, \dots, T$ values for $x_{i,t}$, and $y_{i,t}$, because of the autoregressive idea of the relapse, the successful example size will constantly be $t=1, \dots, (T-P)$ to represent the way that one necessity p instates values for every one of the factors. Specifically, for the situation where $T, N \rightarrow \infty$ see that $W_i, T_d \rightarrow T \rightarrow \infty \chi^2(k)$ for each i . Appropriately, one is left with N -free and indistinguishably circulated arbitrary factors, each with means K and fluctuation $2K$. Consequently, the traditional Lindberg-Duty CLT applies, and the main restricting outcome follows. For the subsequent case, DH exhibit that when T is fixed, W_i, T address N autonomous irregular factors yet each has to mean $K(T-3K-1)T-3K-3$ and change $2K(T-3K-1)2(T-2K-3)(T-3K-3)2(T-3K-5)$ thus they are not indistinguishably dispersed. For this situation, one can conjure the Lyapunov CLT, and the subsequent outcome follows. Obviously, it follows promptly that as $T \rightarrow \infty$, both restricting outcomes harmonize.

The assessor is limited by the present moment (aside from block) and long haul coefficients and the speed of change toward balance is no different for every cross-segment. The point of the test is to identify whether there exist fixed impacts in the powerful model. Two assessment strategies are in many cases used to gauge board information models. The first (mean gathering assessor) comprises averaging separate appraisals for each gathering on the board. As per Pesaran and Smith (1995), this assessor gives predictable appraisals of the boundaries' midpoints.

This is the pooled mean-bunch (PMG) assessor. The PMG assessor compels the drawn-out coefficients to be something very similar across nations and permits just the transient coefficients to fluctuate. The method applies the greatest probability assessor. PMG technique considers homogeneity in a situation with a long period running also allowing for running in the short period variation. Also, the MG technique is the next technique for the ARDL method. Also, we can see the need of PMG's approach to the variety of types short and long-term. DFE will be last technique to use in the ARDL method. The DFE approach engages both types of homogeneity limitations short and long-run.

CHAPTER IV

Results

Statistical analysis

In chapter four, the main purpose is analysing all proposed tests which include: unit root test (URT), Dumitrescu and Hurlin causality test(DH), Westerlund co-integration test(WCT), and PMG-ARDL test in highest green growth OECD countries.

Results

Panel descriptive test

Table 1:Panel descriptive test results

Variable	Obs	Mean	Std. Dev.	Min	Max
GGI	143	120.2605	586.1999	56.87	7081
EFPI	143	5.552325	1.142712	2.938379	8.03618
HCD	143	3.325694	0.2373425	2.803053	3.675378
REC	143	8.884741	6.957807	0.691251	31.29
FDI	143	0.6096677	0.2097808	0.2091722	0.9549955
DRET	143	2.314196	3.118031	0.1	23.15

Unit Root Test (URT)

By utilizing the “CADF and CIPS unit root test” which was introduced by Pesaran (2007) the constant properties of the series were examined, as shown in Table 2. By investigating Table 2 we can see the outcomes of this method. All of them illustrate the progressions include unit root at its structure which is fixed. The null hypothesis consider that all cross-sections are independence, but at significance level of 1% this hypothesis is rejected, also The results illustrate that all sequences have a unit root.

Table 2:URT results

Table				
URT Results				
Parameters	Level		First Difference	
	CIPS	CADF	CIPS	CADF
LGGI	-1.713	-1.713 [0.45]	-2.197 *	-2.19 [0.045]*
LEFPI	-1.907	-1.907 0.210]	-3.337*	-3.337 [0.00]*
LHCD	2.552	2.552 [0.99]	-3.018*	-3.018 [0.00]*
LREC	-2.405 *	-2.405 [0.002]*	-3.581 *	-3.581 [0.00]*
FDI	-2.405*	-2.405 [0.002]*	-3.591*	-3.591 [0.00]*
LDRET	-2.426*	-2.426 [0.002]*	-3.703*	-3.703 [.000]*

Westerlund Co-integration (WCT)

By using this test, the related outcome determined which is prepared in Table 3. According to values of P-Value, the basic hypothesis or in other words the null hypothesis (H0) is dismissed and we should accept hypothesis that is alternative. Because the value of P-Value should be more than 1% but it is not.

Table 3: WCT results with 1% significant value

Table			
WCT results			
Statistic	Value	Z-Value	P-Value
Gt	-0.140	6.853	0.002
Ga	-0.467	5.258	1.000
Pt	-9.928	-3.081	0.001
Pa	-8.031	-2.664	0.004
Notes: ** refer significant at 1%.			

PMG-ARDL results

The type and scale of the short-long term connections amongst ecological footprint, renewable energy technology, renewable energy consumption, financial advancement, and human capital and EF are investigated by three models, namely pool mean group (PMG), mean group (MG), and dynamic fixed effect (DFE) (Pesaran et al., 1999). The (ECT) or error correction term is statistically significant and negative at (5 %) for all results which are estimated, it is illustrating the modification speed in imbalance correction through the long run equilibrium and also the significant relationship as shown in Table 4. To see the performance and stability of all estimators and techniques, the Hausman test (Hausman, 1978) utilizes. Homogeneity constraints was investigated and validated in a long term across OECD countries, so the efficacy of all estimators include MG, PMG and DFE was tested. By using Hausman test, results demonstrate that the null hypothesis of the essence of some homogeneity limitations through long-term regression is admitted, declaring that PMG technique is more effective by comparing with other techniques.

By checking results of PMG method it can conclude that renewable energy consumption has statistically significant positive efficacy on green growth in short term, and also it is positive in long term, it means with 1% positive change in financial development GG will improve by 1.494% and 0.075%. This outcome supported by (tugcu et al, 2012; Apergis et al., 2010). That mentioned by incrementing the income the usage of REC will increment accordingly in OECD, and cause a social satisfaction on RE unlike the non-renewable energies, because REC act against the environmental deterioration and similar problems. The positive connection between REC and green growth illustrates that, using REC is one of the instruments to reach green growth. By examining the OECD countries regulation, it is clear that they utilized new policies and strategies against the emission of greenhouse gases and also CO₂ emitting. They have set the energy production and transportation industries as their first goals. According to their opinion, by turning to the use of RE, job positions as well as green and environmentally friendly technologies will achievable, that is why the more incentive policies like less environmental tax consider for pioneering industries in the use of renewable energy, and governments committed to extremely invest on low-carbon research and development activities. As a result, the efficacy of REC will appear on sustainable development and subsequently on GG.

The outcomes show that human capital significant and positive efficacy on GG in the long runs, indicating that a 1% positive change in human capital increases green growth by 37.67%. Although previous studies prove the positive relationship between human capital and green growth for instance (Godil et al. 2021). Human capital development has a substantial role in accomplishing suitable and cautious policies regarding the environment. In this context, the role of human capital in improving institutional quality may positively affect the environment, as this impact can be shown through production activities and the application of regulations.

Based on the tendency of human resources on innovations technology, they can change production activities and cause produce safer products for the environment and thus help to reach green growth. By investing of money in technologies related to energy the effect of human capital development can be increased on GG. Investment in clean and sustainable technology innovation efficiency in energy area, can cause improving the rate of GG. Robust and affective institutions can sustain environmental quality and subsequently improve green growth by establishing and implementing appropriate regulation and policies. An important factor that can be the level of awareness of human capital towards the environment and as a result of green growth is their income level, which will be more effective as it increases. Considering the significant efficacy that human capital has on production and consumption, it should be able to support more people with incentive policies such as tax reduction, which helps green growth in OECD.

By investigating in PMG results it illustrate that financial development has statistically significant positive efficacy on green growth in Long-short term, it means with 1% positive change in financial development, GG will improve by 0.692% and 0.231%. The positive connection between financial progress and green growth illustrates that financial progress plays a significant role to reach green growth. By examining the economies like the OECD countries, it is clear that they utilized new approach instead of traditional finance to support the GG. They applied the policies to achieve less CO₂ emission by economic development, as a result, the efficacy of financial advancement on green growth in countries which utilize RE as large segment of total energy is high. To reach this aim, some organizations like European Strategic Investment Fund invests in green technology by doing some actions like preparing loans and using financial instruments. On the other hand, FD can increase the amount of investment in renewable energies and related technologies, it can cause the clean

environment and lower cost at the same time. This outcome supported by (Apergis et al., 2017).

By looking at table 4, it can understand that the RET cause a positive effect on green growth in both long and short term Innovations in energy technologies help to improve green growth because as mentioned before it can cause rising the utilization of sustainable energy. Referring that with incrementing 1 % in renewable energy technology raises green growth. (Khattak et al., 2020) also approve this results. The investigation indicates that utilizing technology and innovation will cause positive efficacy on the REC, especially on REC that are related and depend on technologies, that is why the positive relationship between financial development and green growth can be justified in OECD because with financial development and through capital assistance, companies can achieve new technologies in the field of energy, this will possible through long-term investments in these countries, because in this way, the funds will utilize in the in the development of technologies in the field of RE correctly. As a result, the renewable energy consumption will raise. In addition to organizational assistance and investment in modern technologies in OECD countries, they have considered policies and incentive regulation for companies that are innovative in the field of technologies, also they fruitfully emphasized on investing in R&D companies that are in this field.

The next variable is ecological footprint, by a glance to PMG results it is understandable that EFP has statistically significant and positive efficacy on green growth in short-long terms, with a 1% increment in ecological footprint, subsequently green growth will increase by 0.445% and 2.505%. The common definition of ecological footprint is the impact of human demand for the use of resources as well as the amount of waste that these human activities leave behind. Financial development can have a negative effect on ecological footprint so, this variable must analysis with awareness of human about the environment. At this point, some other variables play important role, for instance RE is a significant solution that have affective role on environment protection, but just using renewable energy is not enough to reach the purpose. Another significant tool that can be utilized is technologies related to renewable energies innovation in them, by using this information, governments and international organizations can reach a common view at the global level to increase their investments in environmental-friendly R&D institutions, at the same time by obtaining policies such as tax exemption or tax reduction and financial helps in the

form of subsidies they can increment the efficacy of EFT on green growth, this finding is approved by (Ahmet Koseoglu et al 2021, Sharma et al 2020, Sahoo et al 2021)

Table 4: PMG-ARDL test results with 5% significant value

Table						
Model Results [PMG-ARDL]						
Parameters	MG		PMG		DFE	
	LT	ST	LT	ST	LT	ST
ECT	-4.066 [0.014]*		-0.135 [0.008]*		-2.152 [0.000]*	
LHCD	0.301 [0.033]*		37.67 [0.000]*		2.997 [0.014]*	
LREC	2.804 [0.035]*		0.075 [0.992]		0.105 [0.028]*	
FDI	1.463 [0.000]*		0.692 [0.000]*		0.126 [0.006]*	
LDRET	-0.333 [0.325]		0.166 [0.131]		0.004 [0.063]*	
LEFPI	3.680 [0.030]*		0.445 [0.051]*		0.494 [0.042]*	
LHCD		0.421 [0.121]		21.99 [0.312]		6.450 [0.015]*
LREC		-55.02 [0.316]		1.494 [0.030]*		0.227 [0.288]
FDI		1.717 [0.041]*		0.231 [0.047]*		0.654 [0.008]*
LDRET		0.822 [0.018]*		0.351 [0.307]		0.011 [0.018]*
LEFPI		64.93 [0.311]		2.505 [0.033]*		1.064 [0.042]*
Constant	39.261 [0.017]		13.823 [0.922]		1.291 [0.037]	
Hausman	137.21 [0.731]		2.460 [0.008]*			
Observations	180		180		180	
Notes: ECT: Error Correction Term.						
*, Denote statistical significance at, 5%. The value of the coefficient is out of brackets.LT: Long-term ST= Short-term						

Dumitrescu Hurlin test (DH)

The DH test shows fair outcomes related to inharmonious and abnormal panel data. Next table will confirm the outcomes of the PMG test. The information and results in this test indicate whether these variables are complementary to each other or not. In the DH test, the null hypothesis presented that all variables including financial development(LFDI), human capital development(LHCDI), ecological footprint (LEFTI), renewable energy consumption (LRECI), and renewable energy technology (LRETI) have a unidirectional causal relationship with green growth, But the W-bar and Z-bar tilde are significant which means the mentioned hypothesis is rejected and the alternative hypothesis will accept, The DH test illustrate, EFT has a bidirectional causal relationship with GG, also bidirectional relationship is visible between HCD with green growth which means by investigating more on human capital the GG will increment and by increasing GG governments will interest more to spend more money in this area, also financial development has a bidirectional relationship with GG and it shows this fact that to reach financial development the needs on sustainable energy will increase it means GG will increase and vice versa by rising GG demands for investing will increase , unlike renewable energy consumption which has a unidirectional causal relationship with GG.

Table 5: DH test results with 1% significant value

Table DH test results				
Hypotheses	W-bar	Z-bar	Z-bar tilde	Result
LGGI → LEFPI	3.175	6.879 [0.000]*	2.835 [0.004]*	Bidirectional
LGGI → LHCD	2.2661	4.003 [0.000]*	1.383 [0.066]*	Bidirectional
LGGI → LREC	1.389	1.232 [0.017]	-0.016 [0.986]	Unidirectional
LGGI → FDI	2.640	5.188 [0.00]	1.981 [0.047]*	Bidirectional
LGGI → LDRET	2.223	3.869 [0.00]	1.315 [0.018]*	
Notes: ** refer significant at 1%.				

CHAPTER VI

Conclusion

This thesis focuses on association about renewable energy consumption or in short (REC) and technology (RET), human capital development (HCD), ecological footprint (EFT), and (FD) which is stand for financial development, and effect of them on the green growth in OECD countries. Thus this thesis do an examination on the linkage between mentioned variables human capital development, ecological footprint, renewable energy consumption, renewable energy technology, financial development and green growth in OECD countries by using second generation unit root test (URT), Pooled Mean Group in short (PMG) , (MG) that is stand for mean group, and also dynamic fixed effects or in short (DFE) and the last one is Dumitrescu and Hurlin test or in short (DH) causality from 2010 to 2020. The results of second generation unit root tests indicated that the variables are stationary at their first differences, also the null hypothesis for this test stated that all cross-sections are independence but according to table 2 at significance value of 1% this hypothesis is rejected because the probability value is less than 1%.

The panel westerlund co-integration test outcomes indicated that the null hypothesis is rejected because the probability value in this test for all variables are not less than 1%.

By using Hausman technique in ARDL test, results illustrate that the null hypothesis of the essence of some homogeneity limitations through long-term regression is admitted, so it means that PMG method is more effective compared with DFE and, MG techniques.

The outcomes show that human capital cause significant and positive efficacy on GG in the long runs, 37.67% improvement in green growth appear per percent of increasing the HCD. Based on the interests of human resources on innovations in technology, production activities are changeable by them and it will cause producing products which are safe for the environment and thus help to reach green growth. Therefore, the tendency of human resources to innovation in technology can be a little bit change to achieve significant efficacy which is positive on green growth in short running. By funding in technologies related to energy the efficacy of HCD can be increased on green growth. Considering the significant efficacy that human capital has on production and consumption, it should be able to support more people with incentive policies such as tax reduction, which helps green growth in OECD. FD has

statistically significant positive efficacy on green growth in Long-short term, it means GG will improve by 0.692% and 0.231% respectively. Governments utilized some policies to achieve less CO₂ emission by economic development it means using renewable energies increase, as a result, the efficacy of financial advancement on green growth in countries which utilize RE as large segment of total energy is high. For instance, governments and organization invests in green technology by doing some actions like preparing loans and using financial instruments.

REC has statistically significant positive efficacy on green growth in short term, and also it is positive in long term, it means by 1% change in financial development GG will rise by 1.494% and 0.075%. As mentioned by incrementing the income the usage of REC will improve subsequently in OECD, because a social satisfaction on using RE will create, unlike the non-renewable energies, because people see REC against the environmental deterioration. So, governments applied policies against the emission of CO₂ and greenhouse gases, energy and transportation industries as their first goals. Also governments believe that by using renewable energy industry job positions as well as green and environmentally friendly technologies will achievable, because of these reason the more incentive policies like less environmental tax consider for pioneering industries in the use of renewable energy, and governments dramatically invest on low-carbon R&D activities.

The next variable is RET that cause a positive effect on green growth in short - long run, innovations in energy technologies help to improve green growth because as mentioned it can cause rising the utilization of sustainable energy. The investigation indicates that utilizing technology and innovation will cause positive efficacy on the REC, because of these reasons the positive relationship between financial development and green growth can be visible in OECD, because with financial development and through capital assistance companies can achieve new technologies in the field of energy, this will possible through long-term. so, the renewable energy consumption will raise. EFT, as statistically significant and positive efficacy on green growth in short-long terms, so with a 1% increment of that, accordingly green growth will increase by 0.445% and 2.505%. But the main issue is ecological footprint cannot create positive impact on green growth without cooperation of other variables, some other variables play important role, for instance RE is a significant solution that have affective role on environment protection, but just using renewable energy is not enough to reach the purpose. Other important variable is technologies related to

renewable energies and innovation in them, so now these informations are useful for governments and international organizations to make a common view at the universal level to concentrate on investments in environmental-friendly R&D institutions, and also obtaining policies such as tax exemption or tax reduction and financial helps in the form of subsidies the efficacy of EFT on green growth will improve.

The next test is DH that shows fair outcomes related to inharmonious and abnormal panel data. The results of DH test confirm the outcomes of the PMG test. The information and results in this test illustrate whether these variables are complementary to each other or not. In the DH test, the null hypothesis stated that all variables including financial development(LFDI), human capital development(LHCDI), ecological footprint (LEFTI), renewable energy consumption (LRECI), and renewable energy technology (LRETI) have a unidirectional causal relationship with green growth, But the \bar{W} and \tilde{Z} are significant which means the mentioned hypothesis is rejected and the alternative hypothesis will accept, also the DH test illustrate, EFT has a bidirectional causal relationship with GG, and same as that bidirectional relationship is visible between HCD and green growth, as well as financial development that has a bidirectional relationship with GG, but renewable energy consumption which has a unidirectional causal relationship with GG.

This thesis investigated all variable and association them to effect on green growth, some variables have a positive effect on green growth directly, but by a glance on others like ecological footprint it can visible these variables and some other factors can cooperate with each other to achieve the goal. In this way, the role of governments and their policies, also regulation like taxes and investing on green technologies, renewable energies, education and training, etc. are undeniable

References

- Adedoyin, F. F., Gumede, M. I., Bekun, F. V., Etokakpan, M. U., & Balsalobre-Lorente, D. (2020). Modelling coal rent, economic growth and CO₂ emissions: Does regulatory quality matter in BRICS economies? *Science of the Total Environment*, 710, 136284. <https://doi.org/10.1016/j.scitotenv.2019.136284>
- Aghion, P., Bacchetta, P., & Banerjee, A. (2004, September). Financial development and the instability of open economies. *Journal of Monetary Economics*, 51(6), 1077–1106. <https://doi.org/10.1016/j.jmoneco.2003.12.001>
- Ahmed, F., Kousar, S., Pervaiz, A., & Kousar, S. (2021). Do institutional quality and financial development affect sustainable economic growth? Evidence from South Asian countries. *Borsa Istanbul Review*, 22(1), 189–196. <https://doi.org/10.1016/j.bir.2021.03.005>
- Ahmed, M., Hafeez, M., Kaium, M. A., Ullah, S., & Ahmad, H. (2022). Do environmental technology and banking sector development matter for green growth? Evidence from top-polluted economies. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-022-23153-y>
- Ahmad, M., & Wu, Y. (2022). Combined role of green productivity growth, economic globalization, and eco-innovation in achieving ecological sustainability for OECD economies. *Journal of Environmental Management*, 302, 113980. <https://doi.org/10.1016/j.jenvman.2021.113980>
- Amuakwa-Mensah, F., & Näsström, E. (2022). Role of banking sector performance in renewable energy consumption. *Applied Energy*, 306, 118023. <https://doi.org/10.1016/j.apenergy.2021.118023>
- Anton, S. G., & Afloarei Nucu, A. E. (2020). The effect of financial development on renewable energy consumption. A panel data approach. *Renewable Energy*, 147, 330–338. <https://doi.org/10.1016/j.renene.2019.09.005>
- Apergis, N., Paramati, S. R., & Ummalla, M. (2017). Financing clean energy projects through domestic and foreign capital: The role of political cooperation among the EU, the G20 and OECD countries. *Energy Economics*, 61, 62–71. <https://doi.org/10.1016/j.eneco.2016.11.001>

- Apergis, N., & Payne, J. E. (2010). Energy consumption and growth in South America: Evidence from a panel error correction model. *Energy Economics*, 32(6), 1421–1426. <https://doi.org/10.1016/j.eneco.2010.04.006>
- Asongu, S. A., & Odhiambo, N. M. (2021). The green economy and inequality in Sub-Saharan Africa: Avoidable thresholds and thresholds for complementary policies. *Energy Exploration & Exploitation*, 39(3), 838–852. <https://doi.org/10.1177/0144598720984226>
- Asteriou, D., & Spanos, K. (2019). The relationship between financial development and economic growth during the recent crisis: Evidence from the EU. *Finance Research Letters*, 28, 238–245. <https://doi.org/10.1016/j.frl.2018.05.011>
- Ates, S. A., & Derinkuyu, K. (2021, February 21). Green growth and OECD countries: measurement of country performances through distance-based analysis (DBA). *Environment, Development and Sustainability*, 23(10), 15062–15073. <https://doi.org/10.1007/s10668-021-01285-4>
- Bahmani-Oskooee, M., Iqbal, J., & Khan, S. U. (2016, June 13). Impact of exchange rate volatility on the commodity trade between Pakistan and the US. *Economic Change and Restructuring*, 50(2), 161–187. <https://doi.org/10.1007/s10644-016-9187-9>
- Bi, H., Xiao, H., & Sun, K. (2018, October 31). The Impact of Carbon Market and Carbon Tax on Green Growth Pathway in China: A Dynamic CGE Model Approach. *Emerging Markets Finance and Trade*, 55(6), 1312–1325. <https://doi.org/10.1080/1540496x.2018.1505609>
- Bouraiou, A., Necaibia, A., Boutasseta, N., Mekhilef, S., Dabou, R., Ziane, A., Sahouane, N., Attoui, I., Mostefaoui, M., & Touaba, O. (2020). Status of renewable energy potential and utilization in Algeria. *Journal of Cleaner Production*, 246, 119011. <https://doi.org/10.1016/j.jclepro.2019.119011>
- Cao, J., Law, S. H., Samad, A. R. B. A., Mohamad, W. N. B. W., Wang, J., & Yang, X. (2021, April 26). Impact of financial development and technological innovation on the volatility of green growth—evidence from China. *Environmental Science and Pollution Research*, 28(35), 48053–48069. <https://doi.org/10.1007/s11356-021-13828-3>
- Cao, J., Law, S. H., Samad, A., Mohamad, W. S. S. W., Wang, J., & Yang, X. (2022). Effect of financial development and technological innovation on green

- growth—Analysis based on spatial Durbin model. *Journal of Cleaner Production*, 365, 132865. <https://doi.org/10.1016/j.jclepro.2022.132865>
- Caporale, G. M., Rault, C., Sova, A. D., & Sova, R. (2014, October 7). Financial Development and Economic Growth: Evidence from 10 New European Union Members. *International Journal of Finance & Economics*, 20(1), 48–60. <https://doi.org/10.1002/ijfe.1498>
- Chen, M., Sohail, S., & Majeed, M. T. (2022, July 26). Revealing the effectiveness of environmental policy stringency and environmental law on environmental performance: does asymmetry matter? *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-022-21992-3>.
- Chien, F., Ananzeh, M., Mirza, F., Bakar, A., Vu, H. M., & Ngo, T. Q. (2021). The effects of green growth, environmental-related tax, and eco-innovation towards carbon neutrality target in the US economy. *Journal of Environmental Management*, 299, 113633. <https://doi.org/10.1016/j.jenvman.2021.113633>
- Chu, L. (2021). Determinants of ecological footprint in OCED countries: do environmental-related technologies reduce environmental degradation? *Environmental Science and Pollution Research*, 29(16), 23779–23793. <https://doi.org/10.1007/s11356-021-17261-4>
- Dai, H., Xie, X., Xie, Y., Liu, J., & Masui, T. (2016). Green growth: The economic impacts of large-scale renewable energy development in China. *Applied Energy*, 162, 435–449. <https://doi.org/10.1016/j.apenergy.2015.10.049>
- D'Alessandro, S., Cieplinski, A., Distefano, T., & Dittmer, K. (2020). Feasible alternatives to green growth. *Nature Sustainability*, 3(4), 329–335. <https://doi.org/10.1038/s41893-020-0484-y>
- Danish, & Ulucak, R. (2020). How do environmental technologies affect green growth? Evidence from BRICS economies. *Science of the Total Environment*, 712, 136504. <https://doi.org/10.1016/j.scitotenv.2020.136504>
- Dinda, S. (2014). A theoretical basis for green growth. *International Journal of Green Economics*, 8(2), 177. <https://doi.org/10.1504/ijge.2014.065851>
- Deng, Z., Liu, J., & Sohail, S. (2021). Green economy design in BRICS: dynamic relationship between financial inflow, renewable energy consumption, and environmental quality. *Environmental Science and Pollution*

- Research*, 29(15), 22505–22514. <https://doi.org/10.1007/s11356-021-17376-8>
- Du, L., Jiang, H., Adebayo, T. S., Awosusi, A. A., & Razzaq, A. (2022, August). Asymmetric effects of high-tech industry and renewable energy on consumption-based carbon emissions in MINT countries. *Renewable Energy*, 196, 1269–1280. <https://doi.org/10.1016/j.renene.2022.07.028>
- Gavurova, B., Megyesiova, S., & Hudak, M. (2021). Green Growth in the OECD Countries: A Multivariate Analytical Approach. *Energies*, 14(20), 6719. <https://doi.org/10.3390/en14206719>
- Greenwood, J., Search for more articles by this author, & Jovanovic, B. (1990, October 1). Financial Development, growth, and the distribution of income: *Journal of Political Economy*: Vol 98, no 5, part 1. *Journal of Political Economy*. Retrieved October 24, 2022, from <https://www.journals.uchicago.edu/doi/abs/10.1086/261720>
- Guo, J. (2021). Contribution and Mechanism of Different Levels of Educational Human Capital to the Identification of Regional Green Economic Growth. *Computational Intelligence and Neuroscience*, 2021, 1–11. <https://doi.org/10.1155/2021>
- Gupta, M. R., & Dutta, P. B. (2017, July 7). Tourism development, environmental pollution and economic growth: A theoretical analysis. *The Journal of International Trade & Economic Development*, 27(2), 125–144. <https://doi.org/10.1080/09638199.2017.1346139>
- Ha, D. T. T., & Hoang, N. T. (2020, January 3). Exchange Rate Regime and Economic Growth in Asia: Convergence or Divergence. *Journal of Risk and Financial Management*, 13(1), 9. <https://doi.org/10.3390/jrfm13010009>
- Hafeez, M., Rehman, S. U., Faisal, C. M. N., Yang, J., Ullah, S., Kaium, M. A., & Malik, M. Y. (2022, September 2). Financial Efficiency and Its Impact on Renewable Energy Demand and CO2 Emissions: Do Eco-Innovations Matter for Highly Polluted Asian Economies? *Sustainability*, 14(17), 10950. <https://doi.org/10.3390/su141710950>
- Hall, C. M. (2013b). Framing behavioural approaches to understanding and governing sustainable tourism consumption: beyond neoliberalism, “nudging” and

- “green growth”? *Journal of Sustainable Tourism*, 21(7), 1091–1109. <http://doi.org/10.1080/09669582.2013.815764>
- 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, 141853. <https://doi.org/10.1016/j.scitotenv.2020.141853>
- Hashmi, R., & Alam, K. (2019). Dynamic relationship among environmental regulation, innovation, CO2 emissions, population, and economic growth in OECD countries: A panel investigation. *Journal of Cleaner Production*, 231, 1100–1109. <https://doi.org/10.1016/j.jclepro.2019.05.325>
- Herring, H., & Roy, R. (2007). Technological innovation, energy efficient design and the rebound effect. *Technovation*, 27(4), 194–203. <https://doi.org/10.1016/j.technovation.2006.11.004>
- Hu, Y., Hao, Y., & Raza, A. (2022, July 29). Association between the stock market and green economic growth: Green recovery from BRICS Economics - Economic Change and restructuring. SpringerLink. Retrieved October 23, 2022, from <https://link.springer.com/article/10.1007/s10644-022-09423-2>
- Hua, C., Chen, J., Wan, Z., Xu, L., Bai, Y., Zheng, T., & Fei, Y. (2020). Evaluation and governance of green development practice of port: A sea port case of China. *Journal of Cleaner Production*, 249, 119434. <https://doi.org/10.1016/j.jclepro.2019.119434>
- Huang, S. Z., Chien, F., & Sadiq, M. (2021). A gateway towards a sustainable environment in emerging countries: the nexus between green energy and human Capital. *Economic Research-Ekonomska Istraživanja*, 35(1), 4159–4176. <https://doi.org/10.1080/1331677x.2021.2012218>
- Huang, W., Genaro Reivan Ortiz, G., Kuo, Y. L., Maneengam, A., Nassani, A. A., & Haffar, M. (2022). The Non-linear impact of renewable energy and trade on Consumption-based carbon emissions. *Fuel*, 324, 124423. <https://doi.org/10.1016/j.fuel.2022.124423>
- Hussain, Z., Mehmood, B., Khan, M. K., & Tsimisaraka, R. S. M. (2022). Green Growth, Green Technology, and Environmental Health: Evidence From High-GDP Countries. *Frontiers in Public Health*, 9. <https://doi.org/10.3389/fpubh.2021.816697>

- Ikram, M., Xia, W., Fareed, Z., Shahzad, U., & Rafique, M. (2021). Exploring the nexus between economic complexity, economic growth and ecological footprint: Contextual evidences from Japan. *Sustainable Energy Technologies and Assessments*, 47, 101460. <https://doi.org/10.1016/j.seta.2021.101460>
- Jänicke, M. (2012). “Green growth”: From a growing eco-industry to economic sustainability. *Energy Policy*, 48, 13–21. <https://doi.org/10.1016/j.enpol.2012.04.045>
- Ji, X., Umar, M., Ali, S., Ali, W., Tang, K., & Khan, Z. (2021). Does fiscal decentralization and eco-innovation promote sustainable environment? A case study of selected fiscally decentralized countries. *Sustainable Development*, 29(1), 79–88. <https://doi.org/10.1002/sd.2132>
- Jones, R. S., & Yoo, B. (2011, August 29). Korea's Green Growth Strategy. OECD iLibrary. Retrieved October 23, 2022, from https://www.oecd-ilibrary.org/economics/korea-s-green-growth-strategy_5kmbhk4gh1ns-en
- Kampas, A., Rozakis, S., Faber, A., & Mamica, Ł. (2021). Assessing the Green Growth Trajectory through Resource and Impact Decoupling Indices: The Case of Poland. *Polish Journal of Environmental Studies*, 30(3), 2573–2587. <https://doi.org/10.15244/pjoes>
- Kasztelan, A. (2017, August 1). Green Growth, Green Economy and Sustainable Development: Terminological and Relational Discourse. *Prague Economic Papers*, 26(4), 487–499. <https://doi.org/10.18267/j.pep.626>
- Khan, M. K., Babar, S. F., Oryani, B., Dagar, V., Rehman, A., Zakari, A., & Khan, M. O. (2021, August 2). Role of financial development, environmental-related technologies, research and development, energy intensity, natural resource depletion, and temperature in sustainable environment in Canada. *Environmental Science and Pollution Research*, 29(1), 622–638. <https://doi.org/10.1007/s11356-021-15421-0>
- Khan, M. A., & Rehan, R. (2022). Revealing the Impacts of Banking Sector Development on Renewable Energy Consumption, Green Growth, and Environmental Quality in China: Does Financial Inclusion Matter? *Frontiers in Energy Research*, 10. <https://doi.org/10.3389/fenrg.2022.940209>

- Khan, Z., Badeeb, R. A., & Nawaz, K. (2022). Natural resources and economic performance: Evaluating the role of political risk and renewable energy consumption. *Resources Policy*, 78, 102890. <https://doi.org/10.1016/j.resourpol.2022.102890>
- Khattak, S.I., Ahmad, M., Khan, A., & Rahman, Z. U. (2020). Innovation, foreign direct investment (FDI), and the energy–pollution–growth nexus in OECD region: a simultaneous equation modeling approach. *Environmental and Ecological Statistics*, 27(2), 203–232. <https://doi.org/10.1007/s10651-020-00442-8>
- Kihombo, S., Ahmed, Z., Chen, S., Adebayo, T. S., & Kirikkaleli, D. (2021). Linking financial development, economic growth, and ecological footprint: what is the role of technological innovation? *Environmental Science and Pollution Research*, 28(43), 61235–61245. <https://doi.org/10.1007/s11356-021-14993-1>
- Kim, S. E., Kim, H., & Chae, Y. (2014). A new approach to measuring green growth: Application to the OECD and Korea. *Futures*, 63, 37–48. <https://doi.org/10.1016/j.futures.2014.08.002>
- King, R. G., & Levine, R. (1993, August 1). Finance and Growth: Schumpeter Might Be Right. *The Quarterly Journal of Economics*, 108(3), 717–737. <https://doi.org/10.2307/2118406>
- Kirikkaleli, D., Adebayo, T. S., Khan, Z., & Ali, S. (2021). Does globalization matter for ecological footprint in Turkey? Evidence from dual adjustment approach. *Environmental Science and Pollution Research*, 28(11), 14009–14017. <https://doi.org/10.1007/s11356-020-11654-7>
- Klára Szita Tóthné. (2014). Green Growth in the OECD: State of the Art. *Theory Methodology Practice (TMP)*, 10(02), 59–65. <https://EconPapers.repec.org/RePEc:mik:tmpjrn:v:10:y:2014:i:02:p:59-65>
- Koçak, D. (2020). Green growth dynamics in OECD countries: an application of grey relational analysis. *Grey Systems: Theory and Application*, 10(4), 545–563. <https://doi.org/10.1108/gs-01-2020-0016>
- Koseoglu, A., Yucel, A. G., & Ulucak, R. (2022). Green innovation and ecological footprint relationship for a sustainable development: Evidence from top 20 green

- innovator countries. *Sustainable Development*, 30(5), 976–988. <https://doi.org/10.1002/sd.2294>
- Lee, J. W., & Kwag, M. (2013, June 30). Green Growth and Sustainability: The Role of Tourism, Travel and Hospitality Service Industry in Korea. *Journal of Distribution Science*, 11(7), 15–22. <https://doi.org/10.13106/jds.2013.vol11.no7.15>
- Lei, W., Xie, Y., Hafeez, M., & Ullah, S. (2021, October 31). Assessing the dynamic linkage between energy efficiency, renewable energy consumption, and CO2 emissions in China. *Environmental Science and Pollution Research*, 29(13), 19540–19552. <https://doi.org/10.1007/s11356-021-17145-7>
- Li, J., Dong, X., & Dong, K. (2022, April 7). Is China's green growth possible? The roles of green trade and green energy. *Economic Research-Ekonomika Istraživanja*, 35(1), 7084–7108. <https://doi.org/10.1080/1331677x.2022.2058978>
- Li, T., & Liao, G. (2020, March 20). The Heterogeneous Impact of Financial Development on Green Total Factor Productivity. *Frontiers in Energy Research*, 8. <https://doi.org/10.3389/fenrg.2020.00029>
- Li, X., Shaikh, P. A., & Ullah, S. (2022). Exploring the potential role of higher education and ICT in China on green growth. *Environmental Science and Pollution Research*, 29(43), 64560–64567. <https://doi.org/10.1007/s11356-022-20292-0>
- Li, X., & Ullah, S. (2021, October 22). Caring for the environment: how CO2 emissions respond to human capital in BRICS economies? *Environmental Science and Pollution Research*, 29(12), 18036–18046. <https://doi.org/10.1007/s11356-021-17025-0>
- Lin, X., Zhao, Y., Ahmad, M., Ahmed, Z., Rjoub, H., & Adebayo, T. S. (2021, August 11). Linking Innovative Human Capital, Economic Growth, and CO2 Emissions: An Empirical Study Based on Chinese Provincial Panel Data. *International Journal of Environmental Research and Public Health*, 18(16), 8503. <https://doi.org/10.3390/ijerph18168503>
- Liu, C., Xin, L., Li, J., & Sun, H. (2022, September 7). The Impact of Renewable Energy Technology Innovation on Industrial Green Transformation and Upgrading: Beggar Thy Neighbor or Benefiting Thy

- Neighbor. *Sustainability*, 14(18), 11198. <https://doi.org/10.3390/su141811198>
- Liu, D., Wang, G., Sun, C., Majeed, M. T., & Andlib, Z. (2022). An analysis of the effects of human capital on green growth: effects and transmission channels. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-022-22587-8>
- Liu, R., Wang, D., Zhang, L., & Zhang, L. (2018, October 9). Can green financial development promote regional ecological efficiency? A case study of China. *Natural Hazards*, 95(1–2), 325–341. <https://doi.org/10.1007/s11069-018-3502-x>
- Liu, X., Cao, F., & Fan, S. (2022, September 9). Does Human Capital Matter for China's Green Growth?—Examination Based on Econometric Model and Machine Learning Methods. *International Journal of Environmental Research and Public Health*, 19(18), 11347. <https://doi.org/10.3390/ijerph191811347>
- Longhofer, W., & Jorgenson, A. (2017). Decoupling reconsidered: Does world society integration influence the relationship between the environment and economic development? *Social Science Research*, 65, 17–29. <https://doi.org/10.1016/j.ssresearch.2017.02.002>
- Lv, C., Shao, C., & Lee, C. C. (2021). Green technology innovation and financial development: Do environmental regulation and innovation output matter? *Energy Economics*, 98, 105237. <https://doi.org/10.1016/j.eneco.2021.105237>
- Machiba, T. (2010, June 30). Eco-innovation for enabling resource efficiency and green growth: development of an analytical framework and preliminary analysis of industry and policy practices. *International Economics and Economic Policy*, 7(2–3), 357–370. <https://doi.org/10.1007/s10368-010-0171-y>
- Mahmood, N., Zhao, Y., Lou, Q., & Geng, J. (2022). Role of environmental regulations and eco-innovation in energy structure transition for green growth: Evidence from OECD. *Technological Forecasting and Social Change*, 183, 121890. <https://doi.org/10.1016/j.techfore.2022.121890>

- Mahmood, N., Zhao, Y., Lou, Q., & Geng, J. (2022). Role of environmental regulations and eco-innovation in energy structure transition for green growth: Evidence from OECD. *Technological Forecasting and Social Change*, *183*, 121890. <https://doi.org/10.1016/j.techfore.2022.121890>
- Majeed, M. T., Yu, Z., Maqbool, A., Genie, M., Ullah, S., & Ahmad, W. (2021, April 1). The trade-off between economic growth and environmental quality: does economic freedom asymmetric matter for Pakistan? *Environmental Science and Pollution Research*, *28*(31), 41912–41921. <https://doi.org/10.1007/s11356-021-13709-9>
- Majeed, M. T., Yu, Z., Maqbool, A., Genie, M. G., Ullah, S., & Ahmad, W. (2021a). Correction to: The trade-off between economic growth and environmental quality: does economic freedom asymmetric matter for Pakistan? *Environmental Science and Pollution Research*, *28*(31), 41922–41922. <https://doi.org/10.1007/s11356-021-13968-6>
- Marsiglio, S. (2015, February). Economic Growth and Environment: Tourism as a Trigger for Green Growth. *Tourism Economics*, *21*(1), 183–204. <https://doi.org/10.5367/te.2014.0411>
- Mealy, P., & Teytelboym, A. (2020). Economic complexity and the green economy. *Research Policy*, *51*(8), 103948. <https://doi.org/10.1016/j.respol.2020.103948>
- Mensah, C. N., Long, X., Dauda, L., Boamah, K. B., Salman, M., Appiah-Twum, F., & Tachie, A. K. (2019). Technological innovation and green growth in the Organization for Economic Cooperation and Development economies. *Journal of Cleaner Production*, *240*, 118204. <https://doi.org/10.1016/j.jclepro.2019.118204>
- Nathaniel, S. P., Yalçiner, K., & Bekun, F. V. (2021b). Assessing the environmental sustainability corridor: Linking natural resources, renewable energy, human capital, and ecological footprint in BRICS. *Resources Policy*, *70*, 101924. <https://doi.org/10.1016/j.resourpol.2020.101924>
- Nathaniel, S. P. (2020). Biocapacity, human capital, and ecological footprint in G7 countries: the moderating role of urbanization and necessary lessons for emerging economies. *Energy, Ecology and Environment*, *6*(5), 435–450. <https://doi.org/10.1007/s40974-020-00197-9>

- Ngo, T., Trinh, H. H., Haouas, I., & Ullah, S. (2022). Examining the bidirectional nexus between financial development and green growth: International evidence through the roles of human capital and education expenditure. *Resources Policy*, 79, 102964. <https://doi.org/10.1016/j.resourpol.2022.102964>
- Nosheen, M., Iqbal, J., & Abbasi, M. A. (2021, January 7). Do technological innovations promote green growth in the European Union? *Environmental Science and Pollution Research*, 28(17), 21717–21729. <https://doi.org/10.1007/s11356-020-11926-2>
- Odugbesan, J. A., Rjoub, H., Ifediora, C. U., & Iloka, C. E. (2021). Do financial regulations matters for sustainable green economy: evidence from Turkey. *Environmental Science and Pollution Research*, 28(40), 56642–56657. <https://doi.org/10.1007/s11356-021-14645-4>
- Oryani, B., Koo, Y., Rezania, S., Shafiee, A., Khan, M. S., & Mahdavian, S. E. (2021). The role of electricity mix and transportation sector in designing a green-growth strategy in Iran. *Energy*, 233, 121178. <https://doi.org/10.1016/j.energy.2021.121178>
- Pang, D., Li, K., Wang, G., & Ajaz, T. (2022). The asymmetric effect of green investment, natural resources, and growth on financial inclusion in China. *Resources Policy*, 78, 102885. <https://doi.org/10.1016/j.resourpol.2022.102885>
- Panopoulou, E., & Pittis, N. (2004). A comparison of autoregressive distributed lag and dynamic OLS cointegration estimators in the case of a serially correlated cointegration error. *The Econometrics Journal*, 7(2), 585–617. <https://doi.org/10.1111/j.1368-423x.2004.00145.x>
- Peng, B., Zhang, X., Elahi, E., & Wan, A. (2021, May 1). Evolution of spatial-temporal characteristics and financial development as an influencing factor of green ecology. *Environment, Development and Sustainability*, 24(1), 789–809. <https://doi.org/10.1007/s10668-021-01469-y>
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616>

- Qian, Y., Liu, J., Cheng, Z., & Forrest, J. Y. (2021). Does the smart city policy promote the green growth of the urban economy? Evidence from China. *Environmental Science and Pollution Research*, 28(47), 66709–66723. <https://doi.org/10.1007/s11356-021-15120-w>
- Reilly, J. M. (2012). Green growth and the efficient use of natural resources. *Energy Economics*, 34, S85–S93. <https://doi.org/10.1016/j.eneco.2012.08.033>
- Robert A. Wilson, & Geoff Briscoe. (2005, January 1). The impact of human capital on economic growth: a review. Office for Official Publications of the European Communities. https://www.cedefop.europa.eu/files/BgR3_Wilson.pdf
- Ruiz, J. L. (2018). Financial development, institutional investors, and economic growth. *International Review of Economics & Finance*, 54, 218–224. <https://doi.org/10.1016/j.iref.2017.08.009>
- Sahoo, M., & Sethi, N. (2021). The intermittent effects of renewable energy on ecological footprint: evidence from developing countries. *Environmental Science and Pollution Research*, 28(40), 56401–56417. <https://doi.org/10.1007/s11356-021-14600-3>
- Shahbaz, M., Song, M., Ahmad, S., & Vo, X. V. (2022). Does economic growth stimulate energy consumption? The role of human capital and R&D expenditures in China. *Energy Economics*, 105, 105662. <https://doi.org/10.1016/j.eneco.2021.105662>
- Sharma, R., Sinha, A., & Kautish, P. (2020). Examining the impacts of economic and demographic aspects on the ecological footprint in South and Southeast Asian countries. *Environmental Science and Pollution Research*, 27(29), 36970–36982. <https://doi.org/10.1007/s11356-020-09659-3>
- Shen, N., Wang, Y., Peng, H., & Hou, Z. (2020, August 8). Renewable Energy Green Innovation, Fossil Energy Consumption, and Air Pollution—Spatial Empirical Analysis Based on China. *Sustainability*, 12(16), 6397. <https://doi.org/10.3390/su12166397>
- Shi, Y., Shao, C., & Zhang, Z. (2020). Efficiency and Driving Factors of Green Development of Tourist Cities Based on Ecological Footprint. *Sustainability*, 12(20), 8589. <https://doi.org/10.3390/su12208589>

- Sohag, K., Husain, S., Hammoudeh, S., & Omar, N. (2021, March 8). Innovation, militarization, and renewable energy and green growth in OECD countries. *Environmental Science and Pollution Research*, 28(27), 36004–36017. <https://doi.org/10.1007/s11356-021-13326-6>
- Song, J., Zhou, H., Gao, Y., & Guan, Y. (2022, August 11). Digital Inclusive Finance, human capital and Inclusive Green Development-evidence from China. MDPI. Retrieved October 23, 2022, from <https://www.mdpi.com/2071-1050/14/16/9922/htm>
- Song, M., Zhu, S., Wang, J., & Zhao, J. (2020). Share green growth: Regional evaluation of green output performance in China. *International Journal of Production Economics*, 219, 152–163. <https://doi.org/10.1016/j.ijpe.2019.05.012>
- Steffen, B. (2021, July 1). A comparative analysis of green financial policy output in OECD countries. *Environmental Research Letters*, 16(7), 074031. <https://doi.org/10.1088/1748-9326/ac0c43>
- Talebzadehhosseini, S., & Garibay, I. (2022). The interaction effects of technological innovation and path-dependent economic growth on countries overall green growth performance. *Journal of Cleaner Production*, 333, 130134. <https://doi.org/10.1016/j.jclepro.2021.130134>
- Tanveer, Z., Ahmad, W., Asghar, N., & Rehman, H. U. (2022, May 20). Is the Impact of Technological Innovations on Environment Quality Symmetric or Asymmetric? Vietnam and Switzerland Evidence. *IRASD Journal of Economics*, 4(2), 215–231. <https://doi.org/10.52131/joe.2022.0402.0074>
- Taşkın, D., Vardar, G., & Okan, B. (2020). Does renewable energy promote green economic growth in OECD countries? *Sustainability Accounting, Management and Policy Journal*, 11(4), 771–798. <https://doi.org/10.1108/sampj-04-2019-0192>
- Tawiah, V., Zakari, A., & Adedoyin, F. F. (2021, March 22). Determinants of green growth in developed and developing countries. *Environmental Science and Pollution Research*, 28(29), 39227–39242. <https://doi.org/10.1007/s11356-021-13429-0>
- Toman, M. (2012, May). “Green Growth”: An Exploratory Review. *Policy Research Working Papers*. <https://doi.org/10.1596/1813-9450-6067>

- Tripathy, N. (2019). Does measure of financial development matter for economic growth in India? *Quantitative Finance and Economics*, 3(3), 508–525. <https://doi.org/10.3934/qfe.2019.3.508>
- Tugcu, C. T., Ozturk, I., & Aslan, A. (2012). Renewable and non-renewable energy consumption and economic growth relationship revisited: Evidence from G7 countries. *Energy Economics*, 34(6), 1942–1950. <https://doi.org/10.1016/j.eneco.2012.08.021>
- Ullah, S., Ahmad, W., Majeed, M. T., & Sohail, S. (2021). Asymmetric effects of premature deagriculturalization on economic growth and CO2 emissions: fresh evidence from Pakistan. *Environmental Science and Pollution Research*, 28(47), 66772–66786. <https://doi.org/10.1007/s11356-021-15077-w>
- Ullah, S., Williams, C. C., & Arif, B. W. (2019, September). The Impacts Of Informality On Enterprise Innovation, Survival And Performance: Some Evidence From Pakistan. *Journal Of Developmental Entrepreneurship*, 24(03), 1950015. <https://doi.org/10.1142/S1084946719500158>
- Ullah, S., Majeed, M. T., & Arif, B. W. (2020, May 19). The evolution of an electrical fittings industrial cluster in Pakistan. *GeoJournal*, 86(6), 2657–2670. <https://doi.org/10.1007/s10708-020-10226-z>
- Usman, A., Ozturk, I., Ullah, S., & Hassan, A. (2021). Does ICT have symmetric or asymmetric effects on CO2 emissions? Evidence from selected Asian economies. *Technology in Society*, 67, 101692. <https://doi.org/10.1016/j.techsoc.2021.101692>
- Wang, J., Zhang, S., & Zhang, Q. (2021). The relationship of renewable energy consumption to financial development and economic growth in China. *Renewable Energy*, 170, 897–904. <https://doi.org/10.1016/j.renene.2021.02.038>
- Wang, K., Umar, M., Akram, R., & Caglar, E. (2021). Is technological innovation making world “Greener”? An evidence from changing growth story of China. *Technological Forecasting and Social Change*, 165, 120516. <https://doi.org/10.1016/j.techfore.2020.120516>

- Wang, M., Xu, M., & Ma, S. (2021). The effect of the spatial heterogeneity of human capital structure on regional green total factor productivity. *Structural Change and Economic Dynamics*, 59, 427–441. <https://doi.org/10.1016/j.strueco.2021.09.018>
- Wang, Y., Sun, X., Wang, B., & Liu, X. (2020). Energy saving, GHG abatement and industrial growth in OECD countries: A green productivity approach. *Energy*, 194, 116833. <https://doi.org/10.1016/j.energy.2019.116833>
- Wang, Y., Sun, X., & Guo, X. (2019). Environmental regulation and green productivity growth: Empirical evidence on the Porter Hypothesis from OECD industrial sectors. *Energy Policy*, 132, 611–619. <https://doi.org/10.1016/j.enpol.2019.06.016>
- Wang, X., Wang, Y., Zheng, R., Wang, J., & Cheng, Y. (2022). Impact of human capital on the green economy: empirical evidence from 30 Chinese provinces. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-022-22986-x>
- Wang, X., & Shao, Q. (2019). Non-linear effects of heterogeneous environmental regulations on green growth in G20 countries: Evidence from panel threshold regression. *Science of the Total Environment*, 660, 1346–1354. <https://doi.org/10.1016/j.scitotenv.2019.01.094>
- Wei, X., Ren, H., Ullah, S., & Bozkurt, C. (2022). Does environmental entrepreneurship play a role in sustainable green development? Evidence from emerging Asian economies. *Economic Research-Ekonomska Istraživanja*, 1–13. <https://doi.org/10.1080/1331677x.2022.2067887>
- Xu, J., Zhao, J., She, S., & Liu, W. (2022, October 14). Green Growth, Natural Resources and Sustainable Development: Evidence from BRICS economies. *Resources Policy*. Retrieved October 24, 2022, from <https://www.sciencedirect.com/science/article/pii/S0301420722004755>
- Yang, B., Jahanger, A., & Ali, M. (2021, January 15). Remittance inflows affect the ecological footprint in BICS countries: do technological innovation and financial development matter? *Environmental Science and Pollution Research*, 28(18), 23482–23500. <https://doi.org/10.1007/s11356-021-12400-3>

- Yin, G., Fang, Y., ullah, S., & Shair, W. (2022). Banking sector performance and Green Growth in China: Do education and eco-innovation matter? <https://doi.org/10.21203/rs.3.rs-1352442/v1>
- Yin, W., Kirkulak-Uludag, B., & Zhang, S. (2019). Is financial development in China green? Evidence from city level data. *Journal of Cleaner Production*, 211, 247–256. <https://doi.org/10.1016/j.jclepro.2018.11.106>
- Zafar, M., Shahbaz, M., Sinha, A., Sengupta, T., & Qin, Q. (2020). How renewable energy consumption contribute to environmental quality? The role of education in OECD countries. *Journal of Cleaner Production*, 268, 122149. <https://doi.org/10.1016/j.jclepro.2020.122149>
- Zeng, J., Tong, W., & Tang, T. (2020). How do energy policies affect industrial green development in China: Renewable energy, energy conservation, or industrial upgrading? *Chinese Journal of Population, Resources and Environment*, 18(2), 79–86. <https://doi.org/10.1016/j.cjpre.2021.04.020>
- Zeraibi, A., Balsalobre-Lorente, D., & Murshed, M. (2021). The influences of renewable electricity generation, technological innovation, financial development, and economic growth on ecological footprints in ASEAN-5 countries. *Environmental Science and Pollution Research*, 28(37), 51003–51021. <https://doi.org/10.1007/s11356-021-14301-x>
- Zhang, D., Mohsin, M., Rasheed, A. A., Chang, Y., & Taghizadeh-Hesary, F. (2021). Public spending and green economic growth in BRI region: Mediating role of green finance. *Energy Policy*, 153, 112256. <https://doi.org/10.1016/j.enpol.2021.112256>
- Zhang, L., Godil, D. I., Bibi, M., Khan, M. K., Sarwat, S., & Anser, M. K. (2021). Caring for the environment: How human capital, natural resources, and economic growth interact with environmental degradation in Pakistan? A dynamic ARDL approach. *Science of the Total Environment*, 774, 145553. <https://doi.org/10.1016/j.scitotenv.2021.145553>
- Zhang, X., Guo, W., & Bashir, M. B. (2022, January). Inclusive green growth and development of the high-quality tourism industry in China: The dependence on imports. *Sustainable Production and Consumption*, 29, 57–78. <https://doi.org/10.1016/j.spc.2021.09.023>

- Zhong, J., & Li, T. (2020). Impact of Financial Development and Its Spatial Spillover Effect on Green Total Factor Productivity: Evidence from 30 Provinces in China. *Mathematical Problems in Engineering*, 2020, 1–11. <https://doi.org/10.1155/2020/5741387>
- Zhou, G., Zhu, J., & Luo, S. (2022). The impact of fintech innovation on green growth in China: Mediating effect of green finance. *Ecological Economics*, 193, 107308. <https://doi.org/10.1016/j.ecolecon.2021.107308>
- Zhou, X., & Du, J. (2021). Does environmental regulation induce improved financial development for green technological innovation in China? *Journal of Environmental Management*, 300, 113685. <https://doi.org/10.1016/j.jenvman.2021.113685>

Appendix I
ETHICS COMMITTEE APPROVAL



SCIENTIFIC RESEARCH ETHICS COMMITTEE

28.02.2023

Dear Ali Ghanavati

Your project “**Financial Development and Green Growth: Evidence from highest green growth OECD Countries**” has been evaluated. Since only secondary data will be used the project does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Prof. Dr. Aşkın KIRAZ
The Coordinator of the Scientific Research Ethics Committee

Appendix II

Turnitin Similarity Report

Financial Development and Green Growth: Evidence from highest green growth OECD Countries

thesis

ORIGINALITY REPORT

12%	8%	8%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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