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Green Finance Impact on Economic Growth: A Panel data Analysis

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Abstract

The Green finance is and what the things are that contribute to it. To summarize, the Greenhouse Effect is a process that allows the Earth to retain heat. This allows Earth to still be warm while not facing the sun, and not be too warm while facing it. While the Greenhouse Effect is good in a basic sense, too much volume of greenhouse gases in the atmosphere may cause temperatures to rise, which has been a trend in recent years. While without the greenhouse effect the Earth would experience major temperature swings, too much of the Greenhouse effect would also be bad, because the Earth would be too hot. It is a delicate balance which needs to be maintained on Earth if we wish to inhabit it in centuries to come.An import- driven energy policy is not sustainable for Pakistan. Besides being a drain on its foreign exchange reserves, it exposes the economy to international energy price shocks, putting the entire economy at risk. A green-energy-based energy policy can help Pakistan meet its energy requirements while reducing its dependence on imports and hence reduce the cost of energy to the country. We describe how the regulations and the structure of the power market support the financial viability of renewable energy in Pakistan and enable easy access to financing. The one-buyer, take-or-pay model of power purchase ensures that any new power project that may produce expensive power but provides other benefits like clean energy or an improvement in the balance of payments (use of local fuel instead of imported fuel) can be financially viable provided the government approves the project.[1] However, the increased financial viability and bank ability come at the cost of higher energy prices to consumers due to low operational efficiencies and a higher subsidy burden on the government. We also discuss the challenges faced by distributed renewable energy projects (like home rooftop solar energy solutions) since they do not benefit from the same one-buyer, take-or-pay support. However, alternative schemes like subsidized financing can help increase the penetration of this source of energy

This study has focused mainly on investigating the relationship between Green finance and economic growth in Pakistan. This study has considered in this study Green finance, GDP per capita, expenditure per capita and research and development are considered as independent variables. GDP is considered as the dependent variable. This study has finalized from 100 firms data to testify the relationship between variables mentioned above. Secondary source is used for data collection regarding study variables from the period of 2002 – 2021 (20 years) from the official website WDI. A sample of two countries India and Pakistan's observations is finalized for Green finance. Collected data is then analyzed through statistical instruments

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such as correlation and regression by using E view software. Based on the findings, it is concluded that Green finance , GDP per capita, expenditure per capita and research and development has significant impact on economic growth of Pakistan Findings of this

Study have proved that change in Green finance brings a definite change in economic growth of Pakistan.

***Key Words**: Green Finance, Gross Domestic Product, Expenditure Per Capita, Green House, Research And Development.*

Introduction

Greenhouse Effect is the process of heating of the surface of Earth till the troposphere. It happens because of higher concentration of carbon dioxide, water vapor, methane and other gases. Sunlight heats up Earth's surface, and subsequently, the energy is reflected back to space in the form of infrared radiation. In the greenhouse effect, the concentrated gases absorb the energy, thereby increasing the global temperature. Hence, greenhouse effect and global warming are correlated. Green Money is an important aspect for attaining green growth that raises stable economic growth as a vital constituent to realize sustainable growth. The research debates the heavy control of green to achieve instances of monetary improvement by giving sustainable significant opportunities for growth. One of the major reasons, economists justify green advancements is to further foster a state's ability toward making items by the method that vanquishes natural toxic waste, achievements of green development besides the data, broadens vitality and funds.

Pakistan had been mired in a crippling energy crisis for several years but is experiencing a rapid turnaround in the energy sector with several new projects coming online. However, the interventions undertaken by the government rely heavily on imported fuel such as oil, and coal. An import-driven energy policy is not sustainable for Pakistan. Besides being a drain on its foreign exchange reserves, it exposes the economy to international energy price shocks, putting the entire economy at risk. A green- energy-based energy policy can help Pakistan meet its energy requirements while reducing its dependence on imports and hence reduce the cost of energy to the country. We describe how the regulations and the structure of the power market support the financial viability of renewable energy in Pakistan and enable easy access to financing. The one-buyer, take-or-pay model of power purchase ensures that any new power project that may produce expensive power but provides other benefits like clean energy or an improvement in the balance of payments (use of local fuel instead of imported fuel) can be financially viable provided the government approves the project. However, the increased financial viability and bank ability come at the cost of higher energy prices to consumers due to low operational efficiencies and a higher subsidy burden on the government. We also discuss the challenges faced by distributed renewable energy projects (like home rooftop solar energy solutions) since they

do not benefit from the same one-buyer, take-or-pay support. However, alternative schemes like subsidized financing can help increase the penetration of this source of energy

Green Finance is thus, a vast piece of green development where companies raise possessions to explore their undertakings, similar to the current green progression. In any of the circumstances, the weak growths connected with Green Cash won't spread green industry in the economy. Furthermore, the green belongings could consent the market place, considering the way that the community will misplace their income. This might diversify in practicing environmental security for a better grade. To attain unbiased Green Finance, it would be the currency associated business is foreseeable to enterprise original financial things, and a short time later objective endeavors and progressions for the goal financing. These actions will incite

green development by flattering innovative pushes, rolling Eco- obliging actions and spacing accomplished feasts swapping plan.

Currently, the banks in greatest developing states, derive awake tiny happening of the capacity to measure mortgagors and the non-performance of green implementation assessment appears by all financial records and to be a constraint. The upgrading of imaginative matters, such as, green connections, is a unique boundary of creating economies. The absence of an inimitable and virtually distinguishable explanation could reflex the trust of financial patron. Although, such conditions and significant expenditures may similarly appoint uncertainties as far as of issuance. The additional regulation pertains to the non-attendance of situation disclosure and hapless natural assessment limit of impacts that strengthen the aggregation full primer of material changeable into the speculation self- reliant path process. Banks and development finance institutions of agrarian economies that might be support away from the successful consolidation of physical cause into medium of exchange or ever- changing cycles.
This report covers the first symptomatic of material and situational problems in Pakistan. A discussion about the Green Finance plan of action projected by the SBP, screening both the market involvement side point of view, has also been analyzed. Pakistan is precocious in much physical trouble, which presents utmost risk for wellbeing and life of human. As contradicted by a study, energy (with 51 percent offer) and agricultural animal's area is the evidentiary wellsprings of GHG outflows in the country. Inquiry proposes that environment management is a penitentiary part which will move organization towards low-carbon reduction procedures. This way, financing instruments are needed for forward geographical region economic science in the country.

Green Money Formulation in Pakistan, as per the intercontinental courses of action, SBP formed a design for orientating green transaction, in 2017 which includes the following. In order to offset the disadvantage of banks/betterment finance launch (DFIs) from risk-rising out of the situation, the aim is to execute their stimulate in respect to the security of situation and give cash to alteration the system into an inventiveness-able and environmental condition to extreme one. Recently, the Worldwide Money Organization (IFC) short letter in-caution timing with SBP to help Pakistan in green banking, which is also a part of the duty of IFC for helping the encouragement of countries for lowering the carbon emissions, and common sensible economic system. In this specific condition, the IFC will offer assistance, in addition promote natural hazard. Moreover, the leaders' pattern, assure motivation forward grooming.

Furthermore, to head off orderly problems, banking rules mapped orbit around hazard, the committee processes made to appraisal, examination, and reassessment of natural hazard that can be created from commerce pattern once banks allocate finances. Natural hazard of the finance thought of DFIs or banks are one that can be started for the swap of their lending. These kinds of risks can quickly lead to consequential activity, and its related activities and situation after long adequate timeline. It makes helplessness and full or partial accidents in the DFIs or banks sustenance. The Thought driving familiarizing Green Wealth is with check that. risk from day-to-day.

Pakistan's economy is currently facing the dual challenge of a burgeoning annual fuel import bill and climate change. The oil import bill for 2017–18 was $13 billion (a 30% year-on-year increase) (Hussain 2018). Although the national power generation mix has been restructured in recent years to reduce reliance on imported oil, the new fuel mix leans heavily towards imported Liquefies natural gas **(**LNG). Pakistan should continue to expand indigenous sources including renewables, reduce reliance on imported fuels, and incentivize the development of green energy projects by providing a conducive policy environment, raising awareness, and improving access to green finance. Currently, renewable energy comprises less than 3% of Pakistan's total power generation fuel mix. However, the government is actively trying to promote the

development of renewable energy, particularly the use of solar photovoltaic, small hydro, and wind facilities. The government is also exploring initiatives to improve the management of demand and supply in this market by introducing net metering, which would allow consumers to sell power back to the grid. However, while the concept is theoretically sound, Pakistan's biggest challenge is the lack of adequate electricity transmission and distribution infrastructure to absorb large quantities of power from intermittent renewable energy sources such as wind and solar.

This paper focuses on the economic case for renewable energy in Pakistan, discusses the financial barriers to the development of green energy projects, and outlines the policy instruments needed to unlock the potential of commercial banks to finance such projects.

Climate change is a major issue faced by Pakistan hence it is essential for Pakistan to expand indigenous sources including renewable, lower the dependence on imported fuel and provide incentive for the development of green energy projects especially by improving access to green finance and supporting green energy projects. The government of Pakistan is trying to promote the development of renewable energy, further improving the management of Demand and supply however the main issue in Pakistan is inadequate resources to implement the policies effectively. Hydro power, wind and solar the main sources of green energy in Pakistan, new initiatives and implementation of green banking policies may assist for the growth of this sector, the government is promoting renewable energy and projects to overcome energy crisis in the economy, SBP is also playing a vital role to encourage investment in green projects in order to promote the renewable energy.

Green finance is regarded as the financial support for green growth which reduced greenhouse gas emissions and Air pollutant emissions. Thus for the economic development green finance in agriculture, green buildings and other green project should increase. Green finance covers the improvement of the areas of environmental degradation such as air pollution, water pollution etc. Green growth is the solution to current threats to the global environment mainly focusing on climate change, energy constraints and financial crisis.

Certain strategies need to be implemented, such as;

- Increase of public and private investment
- Identify suitable projects for green finance and approaches for green finance
- the role of agencies in promoting green finance
- promoting investment to allocate environment policy

Problem statement

At its simplest, green finance is any structured financial activity – a product or service – that's been created to ensure a better environmental outcome. It includes an array of loans, debt mechanisms and investments that are used to encourage the development of green projects or minimize the impact on the climate of more regular projects. Or a combination of both. In this study we want to focus on the

area specially the economic growth and green finance in Pakistan. Green finance is not working properly in Pakistan as compare to globe as it has huge impact. We want to find out the impact of green finance on the economic growth of Pakistan by taking the variable of GDP as dependent variable.

Scope of the study and limitation

Green Finance is important as it promotes and encourages the flow of financial instruments and related services towards the development and implementation of sustainable business models, investment, trade, economic, environmental and social project and policies.

Policies like Green energy can help Pakistan meet its requirements while reducing its dependence on imports, Furthermore it is essential for a developing country like Pakistan to emerge in the process which may be beneficial for the overall development of the economy. It is a platform for investors, businesses to address the concerns that may help them create better opportunities, Like many emerging countries Pakistan has been environmental issues since decades mainly due to technological advancements To deal with them, the concept of Green Finance was presented which Anticipate that both public and private sectors should establish linkages between technological development,

innovation, and the greening of the economy to explore unexploited opportunities for economic growth, the main purpose of this study to analyze the green finance mechanism for sustainable development in Pakistan by exploring the supply side of the green banking approach, which includes various issues faced by banks/DFIs, and the demand side, which refers to the compliance of green banking practices by the borrowers. It also reviews the policies that developing countries have implemented to initiate Green Finance. GF is only analyzed by taking only one dependent variable that is GDP. If we include other financial variable then the result maybe different and have more impact

Literature Review

Economic growth performance of Pakistan remained impressive during last few decades. Agriculture, industry and services sectors have been and are still major contributors to Gross Domestic Product (GDP) growth and Product (GDP) growth. However, the contribution of the agricultural sector is decreasing day by day and the share of industry is increasing. The share of agriculture to GDP, which was 53.2 % in 1950 unfortunately fell down to 30.6% in 1980 and another drop was recorded which 23.3% was in 2005 (State Bank of Pakistan, 2005). Industry which provided 9.6% of GDP increased its share to 22.6%. Pakistan economy grew at the rate of 2 % during 2008-9 (Economic Survey of Pakistan, 2008-9). When Pakistan came into being, the growth rate of Pakistan remained 3.14 % in its first decade. The low growth performance was due to agricultural and industrial backwardness, as people were not familiar with new terms and techniques which resulted in low exports and developing trade relations. The growth performance remained sustained during 1961-1970 but again fell to 4.6% in 1970s.The biggest tragedy of Pakistan happened during this decade when Pakistan disintegrated into two independent states, Pakistan and Bangladesh. The period 1991-2000 was a comparatively relaxed period in Pakistan growth history and its economy grew at 6.15 % during this period. During this period Pakistan experienced democracy from 1991 to 1998 and military government in the remaining part of the decade. The economic growth rate remained 4.68% during the period 2001- 2008. Pakistan annual growth performance has been shown in the following table with comparison of growth performance of neighboring countries (SBP, 2005; Economic Survey of Pakistan, 2008-09). Research plays an important role in economic growth of a country through technological advancement and spillover effects. Research and Development expenditure can be more productive if made on high-tech sector than other sectors (Nadiri, 1993). Pakistan's economy has become quicker on normal than numerous other

low-and middle income nations throughout the course of recent many years. Be that as it may, a few nations in Southeast Asia have fared far and away superior. This paper centers around factors that clarify Pakistan's general development execution. Notwithstanding more customary variables accepted to decide development, this paper especially checks out the job of contrasts in the nature of human resources.
H1 : There is a positive relationship between R&D and economic development.

Expenditure per Capita and Economic Growth

In Pakistan, expenditure per capita in accordance to the economic growth is mostly made by the government of Pakistan through investment in higher education. Universities are considered home for research and expenditure made on higher education does play an important role in economic growth. There are also few specialized organization concerned with economic growth in Pakistan. Pakistan Annual Household Expenditure per Capita recorded between 2002-19 reached 525.446 USD in Jun 2019 whereas according to the research, the average household expenditure per capita is recorded as
425.054 USD. Where it could be clearly seen The research expenditure and quality has improved in recent decades after the formation of Higher Education Commission (HEC) of Pakistan in 2001. Before the formation of HEC, in 1976 the number of publication in Pakistan were 271 per annum only (ISI, 2010).This number almost doubled in 1984-85 when the number of publications reached 512. The 2000s is a decade of research for Pakistan because the number of publication, number of research organizations and expenditures on research all increased with acceptable pace. The publications increased from 1305 in 2000-01 to 7661 in 2008-09. The expenditures in Research and Development (R&D) by a country show its interest in science and technology and other sectors which lead to economic development. It has been observed that rich countries of the world with huge pool of resources spend huge amounts of money on R&D. During the year 1999-2000 the world expenditures on R&D increased from 410 billion USD to 755 billion USD and out of this 80% was made by OECD countries (UNESCO, 2004). The cross-country observational outcomes recommend that collection of actual capital and enhancements in the nature of establishments have the biggest adjustments as far as accomplishing higher development, yet that better schooling and medical services additionally have a huge effect. Interest there will build the chance of Pakistan entering a prudent pattern of high development and worked on day to day environments for the populace. Due to lack of availability of data on R&D the expenditures of higher education was taken as expenditure per capita because in Pakistan most research is conducted in higher education institution. Now coming to the health sector, for the last two decades there has been an increase in per capita health expenditures of Pakistan which is from 177.96 rupees to 2240.49 Rupees which can be recorded from 2000 to 2021. The total expenditures on health observed between these last two decades were 25,405 millions to 482,265 millions. This increase went through a lot of changes that contributed to the gdp as 1.16% than that of 0.05% in 1949-50. Another justification for the use of this expenditure as expenditure on R&D is that high correlation has been noted in higher education expenditure and number of scientific publications. As discussed above R&D sector is so far a neglected sector in Pakistan. It is spending a meager percentage of its GDP on R&D as shown in the Table I. Pakistan spent 0.16% of GDP on R&D in 1997.

The expenditure on R&D fell in coming four years but a frictional increase 2001. The R&D expenditure showed a visible expansion in 2005 (0.44%of GDP). The government of Pakistan realizing the importance of R&D increased expenditure on R&D to 0.68% of GDP in 2007. The establishment of Higher Education Commission (HEC) of Pakistan in 2001 is believed to be the major cause of development of R&D sector in Pakistan.

H2 : There is a positive relationship between Expenditure per Capita and Economic growth.

Green finance and economic growth

Green money has procured huge consideration in current monetary market by giving the accompanying instrument, green securities, green value and green debenture. The principal green bond given by the world bank in 2008, when the intergovernmental of environmental change gave the information on environmental change and its political and affordable effect. The report portrayed an irrefutable connection between human activity and a worldwide temperature alteration, the report additionally told with regards to the expanding events of cataclysmic event. After the profound examination of report the World Bank needed to make some restorative stride which can lessen the danger of financial backer and with positive effects. Starting there of time green security turned into the set of experiences making occasion which generally changed method of venture (World Bank, 2019). Albeit the principal green bond gave by the World Bank in 2007 yet it came in India extremely late. In 2017 Indian Sustainable power improvement organization (IREDA) has sent off first Masala Bonds and raised $300 million for sustainable power (London stock trade bunch, 2017). India set the objective of diminishing fossil fuel byproduct power of Gross domestic product 33 to 35 % by the 2030 under the public assurance objectives and made the declaration that it turns into the primary country on the planet which will utilize just electronic vehicles by 2030. In India, banks whether they are private or public related themselves. Initiatives for the advancement of the maintainable development particularly in Miniature Medium and little endeavors and they were attempting to contribute towards maintainability in numerous ways.

The principal Green Bond gave by Yes Bank in 2015 raised north of 1000 cr. by drifting green infra bond and EXIM Bank likewise raised 500 million dollar by giving green dollar bonds Modified Composition Got on February 01, 2020. Correspondence Creator Sandeep Kumar Rawat, branch of the executives, Dr. Shakuntala Misra Public Recovery College, Lucknow, India. Dr. Anu, branch of the board, Dr. Shakuntala Misra Public Recovery College, Lucknow, India. in 2016(World Bank

,2019). The word Green Money is the blend of two words Green and Money. The term green alludes to any movement which is connected with ecological protection implies any interaction by which we can decrease the utilization of regular assets or we can make new sources goes under the premises of green. Where term finance alludes a course of overseeing cash as well as money. Hence the term green money implies any monetary movement which is connected with ecological protection and age of new sustainable power sources. Green money is an arising area of money that has application during the time spent combination of ecological assurance with monetary advantages. The term join a wide scope of natural well-disposed advancements, ventures, enterprises and it additionally confirms whether it is an achievable idea for adjusting biological deterioration during the time spent processing (Illic and Stojnovic et al, 2018).

There is no standard meaning of green money. Green Money implies finance best the ones drives and organizations which safeguard or less decays the environmental elements. It considers the positive and powerful ecological outcomes even as financing the assignments and business interest in inexhaustible power, strength effectiveness, clean energy, the board of contamination, squander the executives, water sterilization, alleviation and reception systems of environmental change, bio-variety security and improvement of green product for stop individual like material-cotton pack and so on Green money alludes to monetary keep implied for manageable improvement. It comprises of both public and private money (Reddy, 2018). Following are the significance of the green money It safeguards the normal assets for the group of people yet to come. It helps in satisfying the destinations which were taken under the practice environmental awareness drive? It make venture instrument more alluring. It makes a culture of preservation. It fosters an awareness of others' expectations towards country.

H3 : There is positive relation between Green Finance and Economic Growth.

GDP per Capita and Economic Growth

The last GDP of Pakistan in 2020 was 1,193.73 USD according to the world bank where there was a slightest decrease of 7.08% from 2019 as it was 1,285 USD. There was seen a decline of 13.33% in GDP per capita as compared to 2018 which was $1,482, an increase of 1.18% was recorded than that of 2017 as per the stats.. In 2017, gdp per capita of the Islamic Republic of Pakistan was 1,465 USD that increased by 7.05% from 2016. Now coming to the year 2006-07, Pakistan's economy maintained its excellent growth trend for the fifth year in a row. Pakistan's economy has risen at an average pace of around 7.0 percent each year over the previous five years, with growth of 7.0 percent in the current pecuniary year. Pakistan has been able to establish itself as one of the fastest growing economies in

the Asian area as a result of its rapid development. The Gross Domestic Product growth rate of Pakistan is calculated as 4.92 percent on an average basis from 1952 until 2018, which was all time high which was 10.22 percent in 1954 and the lowest recorded was -1.80 percent during the start of Ayub's era in 1952.The economy's continuous expansion over the previous five years has been fueled by dynamism in manufacturing, agriculture, and services, as well as the formation of a new investment cycle fueled by strong domestic demand. The State Bank of Pakistan changed some of its monetary policy to aggressive tightening in an attempt to decrease the costs that were fueling board price increase. The services sector is still doing well, rising at an annual rate of 8.0 percent compared to a target of 7.0 percent and a pace of 9.6 percent the previous year, large scale manufacturing increased by 8.8%, compared to 10.7% last year and a target of 12.5 year, showing signs of a slowdown due to increased capacity utilization on the one hand and stabilization on the demand for industrial products, notably consumer durables on the other. The agriculture industry outperformed last year, with its primary crop sectors returning from a negative growth rate of 4.1 percent to a positive growth rate of 7.6 percent this year. After a year 7.5 percent growth, livestock, a vital component of agriculture slowed a little. Pakistan ranked 181st (nominal) for GDP per capita whereas the gross external debt was $127.02 billions in June 2021.

H4 : There is a positive relationship between the GDP per capita and Economic Growth.

Theoretical framework

Theoretical framework of this study is based on independent and dependent variables such as R&D, Gdp per capita, Expenditure per capita, Green finance as the independent variables and GDP as dependent variables. The independent variables Research and development (R&D) include activities that companies undertake to innovate and introduce new products and services. It is often the first stage in the development process, whereas GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.

Expenditure per capita is the amount that each country spends on health, for both individual and collective services, and how this changes over time can be the result of a wide array of social and economic factors, as well as the financing and organizational structures of a country's health system. The independent variable green finance is to increase level of financial flows (from banking, micro- credit, insurance and investment) from the public, private and not-for-profit sectors to sustainable development priorities. All these independent variables have direct relationship with dependent variable GDP

Methodology and Data Description

Panel data, sometimes referred to as longitudinal data, is data that contains observations about different cross sections across time. Examples of groups that may make up panel data series include countries, firms, individuals, or demographic groups

After the thorough review of the literature, chapter 3 will discuss the methodology of the study. It includes the data set, data collection techniques, data analysis methods, variables under study and measurement of the variables. As this study is empirical in nature, therefore, quantitative technique is applied and designed panel data set of the selected from firms. As, the core aim of this research is to find the impact of green finance on economic performance. . The sample of banks selected based on the data availability. This study used 2002 -2024 sample size of 100 major firms of Pakistan.It includes dependent variables as GDP, independent variable as GDPPC, EXP, R&D and Green Finance dummy Variable.Secondary sources data is used from the world development indicator (WDI) of two countries Pakistan and India form the period of last 20 years.

GDP= $\beta_0+\beta_1$ GF + β_2 R&D + β_3 PER-CAPITA GDP + β_4 EXPENDITURE + μ

GDP= Gross Domestic Product dependant variable GF = Green Finance as independent variable R&D= Research And Development.

B= Beta coefficient U= Error Term

Data Analysis and Findings

On the basis of data collected, data analysis is done with the help of Eview Software by using statistical tests (descriptive statistics, correlation, and regression analysis).

Descriptive statistics Table: 1

	GDP	GF	R&D	GDPPC	EXP
Mean	0.01763	0.0489	31.2146	0.67368	1.25291
Median	0.03216	0.07214	0.61941	0.62341	0.95123
Maximum	0.2361	8.10623	5049.12	3.35216	99.0231
Minimum	0.0717	1.21234	+8998.2	0.00010	112.9316
Std. Dev.	3.5789	0.876	404.403	0.67831	7.5431
Skewness	3.5789	+5.8231	+5.3601	1.39121	+3.2316
Kurtosis	23.9278	132.296	249.82	5.12341	148.6213

Descriptive statistics are brief distinct coefficients that sum up a given data collection, which can be either a portrayal of the whole populace or an example of a populace. These are separated into proportions of central inclination and proportions of variability (spread). Measures of central tendency describe the center of a data set. Measures of variability or spread describe the dispersion of data within the set. Measures of central tendency incorporate the mean, median, and mode, while measures of variability include standard deviation, variance, minimum and maximum variables, kurtosis, and skewness.

Descriptive statistics of all variables that are used in this study have been given above. In descriptive analysis, mean, median, max, min and std. dev. values are included. Starting with the variable of economic growth, it has the mean of 1.7 percent with 3.5 percent of standard deviation Similarly, green finance has the mean of 4.89 percent with 8.76 percent of standard deviation. This suggests that green finance is influencing economic growth with the mean of 4.89 percent. R&D has the mean of 31.2 percent with 40,140.3 percent of standard deviation. This suggests that R&D is influencing economic growth with the mean of 31.2 percent. However, GDP per capita has the mean of 6.7 percent with 6.78 percent of standard deviation. This suggests that GDP per capita is influencing economic growth with the mean of 6.7 percent. Furthermore, expenditure per capita has the mean of 1.25 percent with 7.5 percent of standard deviation. This suggests that expenditure per capita is influencing economic growth with the mean of 1.25 percent. The highest mean value of R&D is (31.21 percent) shows that R&D is such an aspect of fiscal development which is having the highest influence over economic growth. GDP per capita has the lowest influence on economic growth due to its lowest mean value 1.7 percent. The median of green finance is 3.2 percent whereas the green finance has median 7.2 percent, EXP as 9.5 percent and GDP per capita as 6.2 percent. The kurtosis of GDP is 23.92 percent, 132.2 percent of green finance, R&D as 249.8 percent and EXP as 148.62 percent. Green finance GF have positive skewness + 5.8231 , +5.360 R&D and positive +3.2316

Correlation Analysis

The term “correlation” refers to determining the link between two or more variables. When there is a significant association between two or more variables, correlation is considered high. When there is a weak association between two or more variables, however, correlation is considered low. Meanwhile, moderate correlation is defined as a moderate strength of association between two or more variables. The range of correlation coefficients is -1 to +1, and R is used to examine the strength of association between the variables. If the two factors will generally rise and fall together, the value is positive. It represents the degree of similarity between a given time series and a lagged version of itself over successive time intervals. An autocorrelation of +1 represents a perfect positive correlation, while an autocorrelation of negative 1 represents a perfect negative correlation. Each

variable always perfectly correlates with itself meaning the same variables have a relationship of one (1) with one another.

Correlation Matrix Table 2

	GDP	GF	R&D	GDPPC	EXP
GDP	1.00				
GF	0.3567	1.00			
R&D	0.5692	0.345	1.00		
GDPPC	0.625	0.321	0.289	1.00	
EXP	0.601	0.321	0.271	0.306	1.00

The results show that there is a positively significant association between gross domestic product and expenditure with a magnitude of 0.601 and in a positive direction. Green finance and Expenditure have a significant association with a magnitude of 0.321 and in a positive direction. Similarly, there is a moderately significant association between R&D rate and economic growth with a magnitude of
0.271 and in a positive direction. GDP per capita and economic growth have a positively significant relationship with a magnitude of 0.306 and in a positive direction. Expenditure and economic growth have a positively significant association positive direction.

Regression Analysis

Regression analysis shows that coefficient value of green finance is 0.91 at 5% level of significance indicating that green finance significantly affects economic growth. Similarly, coefficient value o R&D is 0.21 at 5% level of significance indicating that R&D affects economic growth. Whereas, coefficient value of GDP per capita is 0.51 at 5% level of significance indicating that GDP per capita affects economic growth. However, coefficient value of EXP is 0.16 at 5% level of significance indicating that EXP affects economic growth. The t-value for each independent variable measures the size of the difference relative to the variation in your sample data. If there is no correlation, there is no association between the changes in the independent variable and the shifts in the dependent variable. The threshold for t-stat is 2, any value till up to 1.95 is considered to be significant. In these results, t- value for all the variables have significant and positive effect on GDP , Here R square for the given data is 0.72 which 72%, whereas the F statistic is 13.25 showing overall model significance.

Regression Analysis Table 3

Variable		Coefficient	t-Statistic
C		28.93	2.312
GF		0.916	2.98**
R&D		0.21	1.97**
GDPP C	0.51	2.37**	
	EXP	0.16	1.98**
	R-squared	0.72	
	F-statistic	13.25	

Data Findings

Hypothesis 1 There is a positive relationship between R&D and economic development is proved in regression analysis. In regression analysis, it is proved that there exists a significant relationship between R&D and economic growth, which accepts H1. The significant relationship between R&D and economic growth explains that R&D is responsible for influencing economic growth.

Hypothesis 2 There is a positive relationship between Expenditure per Capita and Economic growth. is proved in regression analysis. In regression analysis, it is proved that there exists a significant relationship between gross expenditure per capita and economic growth, which accepts H2. The significant relationship between expenditure per capita and economic growth explains that expenditure per capita is responsible for influencing economic growth.

Hypothesis 3 There is positive relation between Green Finance and Economic Growth is proved in regression analysis. In regression analysis, it is proved that there exists a significant relationship between green finance and economic growth, which accepts H3. The significant relationship between green finance and economic growth explains that green finance is responsible for influencing economic growth.

Hypothesis 4 : There is a positive relationship between the GDP per capita and Economic Growth. is proved in regression analysis. In regression analysis, it is proved that there exists a significant relationship between GDP per capita and economic growth, which accepts H4. The significant relationship between GDP per capita and economic growth explains that GDP per capita is responsible for influencing economic growth.

Conclusion and Recommendations

This study has focused on investigating the relationship between Green finance and economic growth in Pakistan . In this study Green finance , GDP per capita, expenditure per capita, and research and development are considered as independent variables. GDP is considered as the dependent variable. To explore the relationship, data regarding variables of this study is collected from official websites WDI from the period of 2002 – 2021 (20 years). To test the acceptance and rejection of hypotheses of this study, a scale of significance level having the range allowed till 5% is set. Hypotheses of the study (H1, H2, H3, H4,) are accepted or rejected on the basis of scale of significance level set.. So, H1, H2, H3 , H4, are accepted and proved significant. Therefore, it is proved that Green finance has significant impact on economic growth.

Conclusion

The Study examined the impact of green finance and its relationship with the economic growth of the economy, in this research Green finance is taken as dummy variable Rapid industrialization around the globe since the 20th century has formed multiple environmental and climate issues. Due to the lack of rules and procedures, the GHG emissions will have an adverse influence on the environment in developing countries. State bank of Pakistan should simplify the necessary levels of compliance to understand the extent to which green finance plan of action can be practical. In conclusion, to edify approximately the concept of green accounts among diverse partners and not fair banks and administrations is critical as to improve the information of green financing. To Advance and elevate green commerce in Pakistan, suggestions in this regard should be reflected, Also there is a need to conduct organized practical analysis to conclude the consequence of green finance on the aspects that cause surrounding challenges inside an economy. To distinguish the mechanism of green finance for maintainable evolution in Pakistan was the main aim of this study, State bank of Pakistan Launched Green finance approaches in 2017. Positive relationship have been found between Green Finance and Economic development, The findings shows that implementing green practices will improve the overall growth of the economy,

Based on the data collected, Many Businesses are now executing green finance policies however it may need to be done more efficiently for a greater results. Also there is a need to conduct organized practical analysis to conclude the consequence of green finance on the aspects that cause surrounding challenges

inside an economy. This article examinations the green finance instrument for progression in Pakistan by exploring the stock side of the green monetary strategy, which considers various issues looked by banks/DFIs, and the premium side, which suggests the consistence of green monetary practices by the borrowers. It moreover mentions the the procedures taken by other emerging nations to execute Green Financing. Practically, it is inconceivable that all firms will follow the course of activity and oblige within the topic of green invocation. Green finance urges every firm to follow environmental Circumstances as there are set rules and regulations. , firm has lack of data as to how to address the environmental issues, so they are not violating business rules. The Green Fund Approach is hardly two years old, and it is fundamental that SBP teach and prepare important stakeholders to create beyond any doubt that methods are to

be precisely taken after by the firm in any of the respect.

Research Limitations

The term "limitation" refers to a restriction that a researcher encounters when conducting research. The researcher encounters just a few restrictions in this study, such as a limited time period, limited sample size, etc., while exploring the correlation among Green finance and economic growth in Pakistan The time range available for doing this study is extremely limited, since more time is required to accomplish this research than is accessible. If additional time is available, a more extensive study (involving data before 2002) might be conducted. However, the researcher should be given more time to collect data relevant to Green finance is before 2002. Additionally, sample size is another constraint. A sample of 20 years (having 100 observations) firms is insufficient. For performing a complete research with greater representation of Green finance, the sample size might be increased to 30 years (having 200 observations) or more. Finally, most of scholars and researchers have performed panel data research and neglected to perform time-series data research on this literature topic, which is another limitation.

Recommendations & Future Research

This study has addressed majority of the aspects, yet minor improvements might be done to make it even more effective and reliable. Minor improvements to the time period, sector, sample size, research nature, etc., can be made. The time duration might be extended in order to help the researcher in performing a suitable research. A suitable time period provided to the researcher may aid in the collection of data relevant to Green finance. Extended time period could give an option to the researcher to collect data from years (which are not included in the study) during data collection process. Involving additional years in data collection help in expanding the sample size, which will improve the validity and reliability of the data collected and analyzed. Furthermore, this study has focused on the Green finance. Furthermore, if the researcher is given a longer time period to complete a research study, the sample size can be expanded. Finally, rather than doing panel data research, time-series data research might be used to analyze the correlation between variables of the study.

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