International Journal of Business and Economic Affairs (IJBEA)
9(1), 28-39 (2024)
DOI: 10.24088/IJBEA-2024-91003
ISSN: 2519-9986

Casual and Dynamic Linkage Between Economic Growth and Green Financial Development in Pakistan

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Abstract: Economic growth and green financial development association has gained a very high concentration in the developed economies. However, developing countries are less focused on this phenomenon because these economies are less financially developed, and Pakistan is no exception. This study aimed to estimate the causal and dynamic relationship between Pakistan's economic growth and green financial development. The study used time-series data from 1990 to 2022 regarding green financial development and economic growth. The outcome of the present study identified that the long and short-term association exist between economic growth and green financial growth. Further, this study examined economic growth, green credit, securities, insurance, investments, foreign direct investment, green production, and green employment. Multivariate and bi-variate co-integration results indicate that economic growth has a long-run significant relationship with all these parameters; however, granger causality results indicate that economic growth leads to FDI (foreign direct investment) and green production leads to economic growth. However, green securities lead to green investment, and green energy leads to green production. Green Insurance and Green Energy have bilateral causality. Green employment leads to green insurance, investment in green jobs, and green energy in green production. Long-run and short-run causal and dynamic linkage exist between economic growth and other green parameters.

Keywords: Green finance, Economic growth, Foreign direct investment, Green investment

Received: 10 January 2024 / Accepted: 11 February 2024 / Published: 3 March 2024

INTRODUCTION

Background of the Study

Financial development explains how a country's financial system grows and becomes more sophisticated. This includes expanding banking services, developing capital markets, and creating new financial instruments and products (Shah, 2019). Ultimately, financial development aims to improve individuals' and businesses' access to capital, promote economic growth, and reduce poverty. Further, financial development encompasses a range of activities to improve access to financial services and products. These include banking services, capital markets, financial instruments, financial regulation, and financial education. Overall, financial development can have many positive impact on an economy, including increased investment, job creation, and economic growth. However, financial development must be carried out responsibly and sustainably to avoid economic instability and financial crises (Nawaz et al., 2021). However, green financial development promotes environmentally sustainable economic growth by integrating environmental factors into financial decision-making. It aims to create a world where economic development is achieved without harming the environment and depleting natural resources. It involves the development of products, including financial services, that enhance environmental sustainable investments activities, such as renewable energy, sustainable agriculture, and eco-friendly technologies (Zhang et al., 2019).

This study is critical because the development of green finance plays an essential role in promoting Pakistan's economic growth while supporting environmental sustainability. Here are some ways in which green finance (GF) can contribute to economic development in Pakistan. However, there is a significant potential for renewable

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energy in Pakistan, particularly solar and wind power. The three key economic areas of Pakistan's economy are the industrial segment (accounts for 19.74% of the GDP), agricultural sector (contributes 22.9% of the GDP), and the service sector (accounts for 61.52%). The service sector makes up most of the economy because it is thought necessary for financial sources; all other economic sectors are affected by the financial services sector.

The relationship between economic growth and green credit involves integrating environment sustainable practices into financial systems. Green credit refers to providing loans, financing, and other fiscal services that support environmental approachable projects and activities. Green securities, such as green bonds and stocks, are financial instruments that raise capital for environment friendly projects. Green securities provide a means to finance renewable energy projects, energy-efficient infrastructure, sustainable agriculture, and other environment beneficial initiatives. Green insurance provides coverage against environmental risks and liabilities associated with sustainable business operations. By reducing potential financial losses and liabilities, green insurance encourages companies to adopt environment friendly practices, invest in sustainable technologies, and undertake green initiatives. Green production refers to adopting environmentally sustainable practices in manufacturing and industrial processes. Green energy generated from renewable sources, such as solar, wind, hydro, and biomass, which have less impact on the environment than fossil fuels, is referred to as "green energy. Energy consumption always remains a main challenge for the globe, and the atmosphere is getting hurt by using less energy, whether renewable or nonrenewable (SanJuan-Reyes et al., 2021; Chien et al., 2021; Li et al., 2021). Numerous studies have examined the impact of green finance on economic growth (Zhou et al. (2020) and Hafeez et al. 2018) but the role of green finance with energy imported was a foremost effort. Green finance can contribute to economic growth by stimulating investment in green technologies and infrastructure, while economic growth can promote green finance by increasing demand for sustainable investments. However, challenges such as the lack of data, information, and policy support can hinder the growth of green finance (Qamri et al., 2022).

The main goal of this research project is to study whether or not sustainable development in Pakistan can be promoted by using green finance as a tool. In more particular terms, the research explored the present condition of green finance in Pakistan and the variables that might contribute to its expansion. According to the economic survey of Pakistan 2022, investors should demand investments that are in line with their Environmental Social and Governance (ESG) values, politicians should enact legislation for green finance, and financial institutions should provide products and services that support green investment. This study aims to contribute in the scholarly discussion on green financial development and economic growth by examining some of the key drivers and impacts of economic growth of Pakistan. In the last three decades, as technology has advanced and awareness about green mechanisms has increased in the developed world, emerging and developing economies are no exception. Hence, to address the pivotal issue in Pakistan, this study examines the issues like green energy, green production, and green employment. For this purpose, the study has explored the existing literature and empirical evidence regarding the relationship that explores the factors contributing to economic growth, such as technological progress, human capital, and institutional quality. Additionally, we analyzed the distributional consequences of economic growth, including its impact on inequality, poverty, and employment.

The study on green fiscal development can also play a role to develop new financial products and services that promote sustainable investments and activities. The study can highlight the potential of green bonds in financing renewable energy projects or the role of green loans in supporting sustainable agriculture practices. Also, the study on green financial development can help to build awareness and understanding of the importance of sustainability in financial decision-making, which is still unaddressed in Pakistan. The results of present study gives a deeper for the regulators, who must increase their attention towards green financial development as it is becoming necessary for the country's economic growth. It can highlight the risks associated with environmentally harmful activities and the potential economic benefits of sustainable investments. The suggested policy measures can create an enabling environment for sustainable development and align financial systems with green financing objectives.

Research Objective

The core goal of this research is to identify the causal and dynamic association between green financial development and economic growth in Pakistan, determine the long and short-run affiliation, and suggest policy measures for increasing green financial growth in Pakistan.

LITERATURE REVIEW

The literature review justifies the present study and details its outlook. Several studies have tried to establish a connection between economic growth and green financial development. Shahbaz et al. (2013) research inspects the connection between energy feasting and economic growth by considering capital, commerce, and financial development as significant production functions in China from 1971 to 2011. Co-integration using the ARDL testing method was used to analyze long-term relations between the series, and the structural break test was used to assess the stationarity of the variables' attributes. The present study describes green financial innovations, credit cards, policies related to green credit, debt card related eco-friendly projects, securities of equity, innovations in green insurance, and green investment from both national and international investors. Credit is significant to an economy since it gives businesses in many financial backing industries.

Pakistan's economic growth was characterized by slow growth rates of around 4% per annum before 2000. From 2000 to 2007, the economy grew at an average annual rate of 5.2% (Asian Development Bank, 2019). This was mainly due to market-oriented reforms, privatization, and deregulation. However, from 2008 to 2013, Pakistan's economic growth slowed down due to various factors, such as increasing terrorist activities, government instability, and global economic crisis (Asian Development Bank, 2019).

Wang et al. (2019) discovered that financial institutions will only fund new projects if they have been subjected to environmental assessments or are designed to reduce pollution. From 2008 to 2016, panel data from 320 companies trading on the Shanghai Stock Exchange that produced substantial pollution were analyzed using a fixed effects regression model. This investigation aimed to establish whether or not Chinese-listed companies and local governments worked together to subvert the green credit scheme. The Corporate Environmental Information Disclosure (CEID) did not correlate positively with the amount of green funding corporations provide. According to this study, banks and other financial institutions focused more on implementing green credit policies that adhere to public and consumer expectations and environmental regulations. Applying green materials to credit cards or credit documents, granting loans for environmentally outgoing initiatives, and establishing environmentally sociable circumstances for granting credits were only a few examples of environmentally friendly clauses added to credit policies. Toxic chemicals were transmitted through credit cards like Barclaycard's Breathe Credit, yet they may be easily recycled without harming human health or the environment. Most ecologically conscious consumers strongly desired to use green cards so it should not impair their health or ability to work. Those with green cards made an essential contribution to economic expansion (Liu et al., 2019).

Aizawa and Yang (2010) stated that operational and financial performance of financial institutions in Pakistan showed an improvement in environmental performance. These environment friendly changes to their loan practices had increased the country's GDP. Nawaz et al. (2020) measured the association between financial development in green, including credit, securities, insurance, investment, and FDI on Pakistan's' economic growth. They have collected time series data from the period 1981 to 2019. They used the ARDL and Granger casualty test to find the outcomes. The study concluded that green financial development had a significant and favourable influence on Pakistan's economic growth. The study concluded that green financial development and economic growth should be integrated to promote sustainable development.

Tran (2021) investigated the association between economic development, energy usage, and CO2 emissions in Vietnam. Data were collected from 1986 to 2018. Cointegration, unit roots, Granger causality, and error correction model (ECM) were used to check the relationship between variables. The study's outcomes revealed that investing in the energy sector reduces CO2 emissions and improves the environment.

Sharif et al. (2022) explored a study to find out how innovation and finance assist the G7 economies in reducing CO2 emissions. Results demonstrated positive and long-term association between GDP and Social globalization. Emissions negatively correlated with innovation and technology and investment but social globalization has a positive relationship with GDP. Xu et al. (2023) examined the impact of green financing tools, mainly green bonds, on driving economic growth in the industrial and agricultural sectors.

Cleaner production also enhances productivity and profitability and provides a competitive edge by reducing production costs (Chandio et al., 2019). This study aims to statistically examine how Pakistan's agricultural economy has grown and how much energy has been used over the years, from 1984 to 2016. In order to look at both the long and short-term drivers of agricultural economic growth in Pakistan, the study utilizes the autoregressive

distributed lag (ARDL) bounds testing approach. Another challenge in implementing green production practices is the lack of awareness and technical knowledge required to embrace sustainable practices. This is particularly relevant in small and medium-sized businesses, where a lack of technical expertise limits the implementation of green production activities.

METHODOLOGY

Research design refers to the overall strategy used to conduct empirical research. The research design for this study is quantitative exploratory based on secondary data. The current study identifies the consequences of green financial development gauges that may affect Pakistan's economic growth. These indicators include green credit, securities, insurance, investments, foreign direct investment, green energy, green production, and green employment. The current study has taken data from World Bank indicators and from the published sources of the State Bank of Pakistan from 1990 to 2022 to achieve the study's objectives. Graphical analysis has been performed to compute the pattern, trend performance, and relationship. Advanced time series econometric techniques have been used to analyze the data and meet the desired outcomes. The study used ADF, Correlation, Johnson Multivariate and Bi-variate Co-integration, and Granger Causality Test for outcomes. The proxy table is given as under,

Table 1: : Description and Proxy of Variables

Variable	Description	Symbol	Data source
Economic growth	[(GDP_t – GDP_{t-1}) /GDP_{t-1}] x100	EG	World Bank data
Green credit	Total green credit of bank/ total loan of bank	GC	State Bank of Pakistan
Green securities	The total market value of environmental protection companies / total market value of a share	GS	World Bank data
Green Insurance	Agriculture insurance expenditure / total insurance expenditure	GI	State Bank of Pakistan
Green investment	Fiscal expenditure of energy saving and environmental-protection industries / total fiscal expenditure	GINV	World Bank data
Foreign direct investment	Net inflows (% of GDP)	FDI	World Bank data
Green production	GDP of Agriculture to total GDP	GP	World Bank data
Green energy	Renewable energy consumption / total final energy consumption	GE	State Bank of Pakistan
Green employment	Employment in agriculture (% of total employment)	GEM	State Bank of Pakistan

Econometric Model

EG = f (GC, GS, GI, GINV, FDI, GP, GE, GEM)

$$EG_t = \beta_0 + \beta_1 GC_{it} + \beta_2 GS_{it} + \beta_3 GI_{it} + \beta_4 GINV_{it} + \beta_5 FDI_{it} + \beta_6 GP_{it} + \beta_7 GE_{it} + \beta_8 GEM_{it} + \varepsilon_{it} \text{.....(1)}$$

Whereas, EG = Economic Growth
GC = Green Credit
GS= Green Securities
GI= Green Insurance
GINV= Green investment
FDI= Foreign Direct Investment
GP= Green Production
GE= Green Energy
GEM= Green Employment
ϵ_t = Error Term

DATA ANALYSIS AND FINDINGS

Graphical analysis is conducted to compute the pattern analysis for each variable. For this purpose, this study has used graphical trends that indicate the behavior or trends of concerned variables from the years 1990-2022. The graphs indicate EG, GC, GS, GI, FDI, GINV, GP, GE and GEM trends over time (see figure 1).

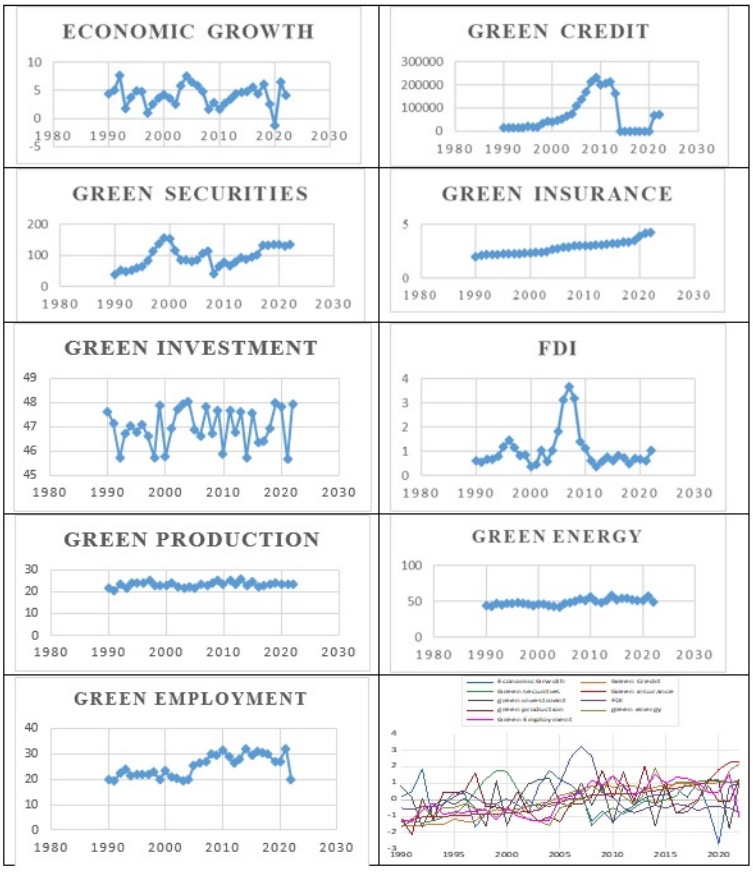

Figure 1: Trend Analysis of variables used in the analysis

Table 2: : Unit Root Analysis using ADF Test at Level

	At Level	EG	GC	GS	GI	GINV	FDI	GP	GE	GEM
With Constant	*t*-Statistic	-4.25	-1.32	-1.97	1.9	-7.39	-2.88	-2.78	-1.47	-2.18
	Prob.	0.002	0.6	0.29	0.99	0	0.059	0.0715	0.5347	0.21
	Level	Yes	No	No	No	Yes	Yes	Yes	No	No
With Constant & Trend	*t*-Statistic	-4.16	-0.75	-2.05	-1.39	-7.4	-2.86	-2.71	-3.17	-2.25
	Prob.	0.01	0.95	0.55	0.84	0	0.18	0.23	0.1	0.44
	Level	Yes	No	No	No	Yes	No	No	No	No
Without Constant & Trend	*t*-Statistic	-1.35	3.05	0.18	4.65	0.37	-1.64	0.7	0.78	0.13
	Prob.	0.15	0.99	0.73	0.99	0.786	0.09	0.86	0.87	0.71
	Level	No	No	No	No	No	Yes	No	No	No

Table 3: : Unit Root Analysis using ADF Test at First Difference

	First Differ	d(EG)	d(GC)	d(GS)	d(GI)	d(GINV)	d(FDI)	d(GP)	d(GE)	d(GEM)
With Constant	*t*-Statistic	-6.07	-5.06	-4.91	-3.85	-5.96	-3.65	-12.47	-6.99	-6.4
	Prob.	0	0	0.04	0.06	0	0.01	0	0	0
	Level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
With Constant & Trend	*t*-Statistic	-5.95	-5.22	-4.82	-4.31	-5.83	-3.64	-12.33	-6.92	-6.4
	Prob.	0.02	0.01	0.02	0.09	0.03	0.04	0	0	0
	Level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Without Constant & Trend	*t*-Statistic	-6.16	-4.04	-4.91	-2.96	-6.05	-3.71	-12.5	-6.86	-6.51
	Prob.	0	0.02	0	0.04	0	0.06	0	0	0
	Level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The stationarity of the data is examined through the ADF Test. This test has been used to examine constants and trends, as well as without constants and trends. If a time series has a unit root that indicates the time series is non-stationarity. Non-stationary time series exhibit a trend or statistical change over time. The ADF test was utilized to analyze EG, GC, GS, GI, GINV, FDI, GP, GE, and GEM. Each variable is analyzed with and without a constant and with and without a trend. The findings of the ADF test are displayed using t-statistics and p-values (see table 2, 3). Results of the study indicate that the series is not stationery as level for EG, GC, GS, GI, GINV, FDI, GP, GE, and GEM; however, at first difference the series become stationary.

Table 4: : Correlation Matrix

Variable	EG	GC	GS	GI	GINV	FDI	GP	GE	GEM
EG	1								
GC	0.04	1							
GS	0.04	0.36*	1						
GI	0.01	0.88**	0.43**	1					
GINV	0.06	0.11	0.02	0.07	1				
FDI	0.005	0.13	0.15*	0.05	0.04	1			
GP	0.24*	0.30*	0.1	0.33*	0.16*	-0.03	1		
GE	0.03	0.73**	0.26*	0.82**	-0.26*	0.01	0.43**	1	
GEM	0.15*	0.75**	0.1	0.63**	-0.34*	0.17*	0.26*	0.75**	1

**Sig at $p < 0.01$
**Sig at $p < 0.05$

The primary goal of correlation analysis is to ascertain the degree of relationship between two variables. The values in the matrix show that the correlations between the variables. A correlation coefficient with values ranging from -1 to 1 expresses the strength and direction of the linear link between two variables. The Economic Growth has positive significant correlation with Green Production and Green Employment at ($p < 0.05$). It is quite interesting that green credit has significant positive correlation with green securities, green insurance, green production, green energy and green employment, However green insurance has significant positive correlation with green production, green energy and green employment. Interestingly the green investment has negative significant correlation with green energy and green employment. Green energy and green production has positive correlation with each other and with green employment.

Johansen Tests of Co-integration

To test the long run relationship between the economic growth and green financial development the Johansen Test of Co-integration has been used. The trace statistics and maximum Eigenvalue test are used to test the hypotheses. The evidence is measured against the null hypothesis and then compared to the critical value to determine whether anything is significant.

The critical value indicates that the null hypothesis cannot be correct. The significance level (alpha) determines how likely the null hypothesis will be rejected even when correct. 5% (0.05) is a frequent statistical significance level. The *p*-values for the hypothesis are located in the column labeled prob.**. If it turns out that the null hypothesis is correct, then the *p*-value is the probability of having a test statistic that is either just as extreme as the observed value or even more severe. If the p-value is less than 0.05, the null hypothesis is rejected as an incorrect assumption. The statistical analysis does not support the null hypothesis that there are no common elements at any of the significance levels ($p < 0.05$) for any alternative hypotheses with at most 1, 2, or 3 common elements. At a significance level of 5%, it is impossible to reject the null hypothesis when considering alternative hypotheses that share at most four elements in common or more. The context and the type of data determine the interpretation of these statistics. Without additional information, these results are difficult to understand and explain.

The below tables 5 and 6 indicated Trace Test and Maximum Eigen Value Test to investigate the long run dynamics.

Table 5: : Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical Value	Prob.**
None *	0.951	333.333	197.37	0
At most 1 *	0.914	239.979	159.529	0
At most 2 *	0.868	163.925	125.615	0
At most 3 *	0.751	100.943	95.753	0.021
At most 4	0.512	57.926	69.818	0.304
At most 5	0.432	35.624	47.856	0.415
At most 6	0.344	18.101	29.797	0.558
At most 7	0.147	4.997	15.494	0.809
At most 8	0.003	0.042	3.841	0.836

* Shows that one co-integration relation exists at a 5% significance level

Table 6: : Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5% Critical Value	Prob.**
No. Of CE(S)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.950778	93.35409	58.43354	0
At most 1 *	0.913994	76.05363	52.36261	0.0001
At most 2 *	0.868888	62.98279	46.23142	0.0004
At most 3 *	0.750332	43.01628	40.07757	0.0227
At most 4	0.512971	22.30236	33.87687	0.5842
At most 5	0.431798	17.52362	27.58434	0.5352
At most 6	0.344714	13.10318	21.13162	0.4428
At most 7	0.147728	4.955336	14.2646	0.7475
At most 8	0.001366	0.042363	3.841465	0.8369

The Johansen Co-Integration Test Trace Statistics results elaborate long-term run relationships in between the economic growth and finical development indicators. As per trace statistics there are four co-integrating vectors exist.

Table 5 indicates the results of the multivariate Johnson co-integration test. Table 5 indicates that the value of trace statistics is 333.33 which is higher than the Critical value of 197.33at $p < 0.05$ at None level, and the trace statistics value of 239.97 is higher than the critical value of 159.52 at $p < 0.05$ at most one and rejects the null hypothesis. Again, the trace statistics value is 163.92, higher than the critical value of 125.62 at $p < 0.05$ at most 2 and rejects the null hypothesis. Again, the trace statistics value is 100.94 which is higher than the critical value of 95.75 at $p < 0.05$ at most 3 and rejects the null hypothesis. Hence, it is concluded by trace statistics that four co-integrated vectors exist, which means that four factors cause a long-run association between economic growth and these indicators of green financial development.

Table 6 shows that the Maximum Eigen is 93.353, rejecting the null hypothesis, and the Maximum eigenvalue value is 76.053, greater than the critical value of 52.36 at $p < 0.05$ at most 1. Furthermore, the Maximum Eigen is higher than the critical value of 98.43 at $p < 0.05$ at None level and the maximum eigenvalue is 62.98, rejecting the null hypothesis because it is greater than the critical value of 46.23 at $p < 0.05$ at most 2. Moreover, the maximum Eigen-value statistics value is 43.01, rejecting the null hypothesis because it is higher than the critical value of 40.077 at $p < 0.05$ at most 3. Hence, the maximum Eigen-value test concludes that four co-integrated vectors exist, which means that there are only four factors that cause a long-run relationship between economic growth and indicators of financial development

Table 7: : Granger Causality Test

Null Hypothesis:	Obs	*F*-Statistic	Probability.	Do causality exist?
Green Credit →Economic Growth	31	0.79545	0.4621	No
Economic Growth →Green Credit		0.39438	0.6781	No
Green Securities →Economic Growth	31	0.09538	0.9093	No
Economic Growth→Green Securities		0.17201	0.8429	No
Green Insurance→Economic Growth	31	2.30263	0.12	No
Economic Growth→Green Insurance		0.99439	0.3836	No
Green Investment→Economic Growth	31	1.42099	0.2596	No
Economic Growth→Green Investment		0.24048	0.788	No
FDI→Economic Growth	31	1.69017	0.2041	No
Economic Growth→FDI		3.23503	0.0556***	Yes
Green Production→Economic Growth	31	6.69496	0.0045*	Yes
Economic Growth →Green Production		0.03682	0.9639	No
Green Energy →Economic Growth	31	0.74528	0.4845	No
Economic Growth→Green Energy		0.01421	0.9859	No
Green Employment→Economic Growth	31	0.60144	0.5555	No
Economic Growth →Green Employment		3.5005	0.0451	No
Green Credit→Green Energy		2.9449	0.0703***	Yes
Green Securities→Green Investment		3.87247	0.0337**	Yes
Green Investment→Green Insurance	31	5.12138	0.0133**	Yes
Green Energy→Green Insurance	31	2.86676	0.075***	Yes
Green Insurance→Green Energy		7.5168	0.0027*	Yes
Green Employment→Green Insurance	31	4.19542	0.0264**	Yes
Green Investment→Green Production		2.57653	0.0953***	Yes
Green Investment→Green Employment		5.75017	0.0086*	Yes
Green Energy→Green Production	31	3.40622	0.0485 **	Yes

*Significant at p <0.01

** Significant at p <0.05

Table 7 indicates bivariate granger causality test. It is hence clear that economic growth leads to FDI and green production leads to economic growth significantly in a unidirectional manner. Moreover, green credit leads to green energy and green energy leads to green insurance whereas green employment leads to green insurance in a unidirectional manner significantly. Green investment leads both green production and green employment as well. However green energy is also leading green production during this period significantly

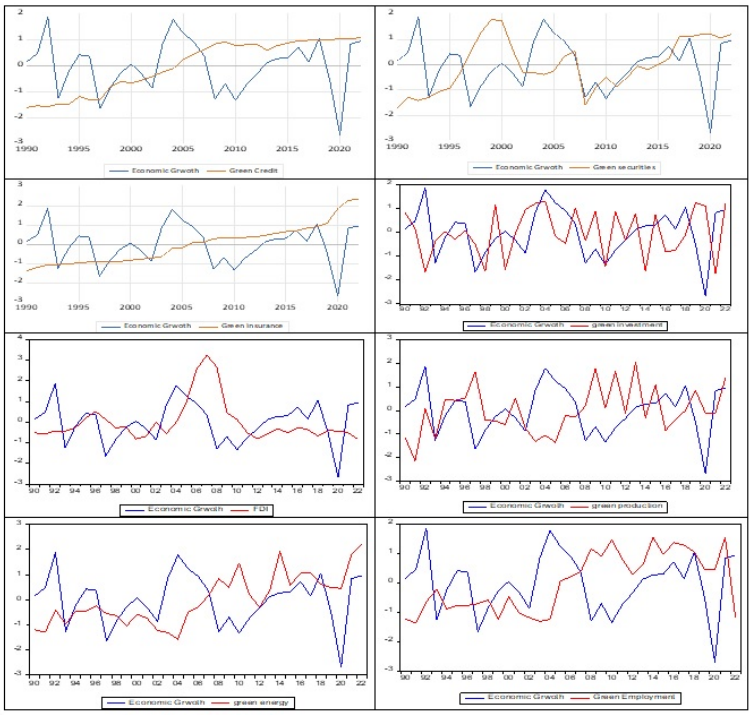

Figure 2: Bivariate co-integrations long run and short run relationship

Short- and long-term linkages are explained in figure 2. The bivariate co-integration results reflect long run relationship between the economic growth and other parameters of green financial development. The findings of the study showed the existence of long-run relationship between economic growth, green securities, FDI, green production and green employment. However, there exist short-term relationship between green credit, economic growth and green investment as reflected in above graph. Additionally, the dynamics of long-run relationship elaborate that there exist association between economic growth and green securities, however, graphic findings indicate that a long-term relationship as well as short run relationship exists between FDI and economic growth for this period.

CONCLUSION

The green financial development is essential to support environmental sustainability and fostering economic growth in Pakistan. Annual data regarding various factors of green financial development and economic growth were taken from 1990 to 2022. The investigation employed the model, which has eight components that influence the development of green finance and impacts on economic growth. The indicators of green financial development are green credit, green securities, and the proportion of insurance costs for agriculture compared to all insurance costs, such as green insurance, green investment, foreign direct investment, green production, green energy, and green employment. In addition, the present study examined the impact of direct investment from other countries on the economic growth of Pakistan. The data has been taken from the published resources of the World Bank indicators, the State Bank of Pakistan, and other published reports. Green financial development explains how a country's financial system grows and becomes more sophisticated for financing environmental phenomena, especially green elements. The results identified that the series is not stationery as level for EG, GC, GS, GI, GINV, FDI, GP, GE, and GEM; however, at first, difference the time series become stationary. The results of Johnsen Co-integtration test reflects that that four co-integrated vectors exist, which means that there are four factors that may cause a long-run association between economic growth and these indicators of green financial development as reflected by Trace and maximum eigen value test. It is hence clear from the results that economic growth leads to foreign direct investment and green production leads to economic growth significantly in a unidirectional manner.

The results conclude that by expanding green banking services and other green financial developments by introducing new green financial instruments and products may meet the future challenges to meet sustainable devel-

opment goals of economic development. Marketing of green financial services is very necessary to meet the new environmental challenges. Ultimately, financial development aims to improve individuals' and businesses' access to capital to promote economic growth and reduce societal poverty. This study may motivate to the policymakers and economists to acknowledge the significance of environmentally responsible financial developments that how to boost economic growth. These recommendations ensure that Pakistan's financial development priorities are environmentally responsible practices, one of the most critical factors contributing to overall economic expansion.

FUTURE DIRECTIONS

The present study focuses on green financial development. The future studies should focus on a disaggregated level to examine the other macroeconomic indicators. The information used to support this study originated from the practices adopted by different manners in the economy i. e. commercial banks, insurance companies, financial markets, industrial and service sector. As a consequence of this study, in order to acquire complete and inside knowledge of the critical factors and how they have an impact on the economy, supporting data from a more significant number of organizations must be gathered.

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