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## Article

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## Provided in Cooperation with:

International Journal of Energy Economics and Policy (IJEPP)

**Reference:** Miar/Neneng, Sunaryo et. al. (2022). The impact Covid-19 outbreak, green finance, creativity and sustainable economic development on the economic recovery in G20 countries. In: International Journal of Energy Economics and Policy 12 (6), S. 432 - 440.  
<https://econjournals.com/index.php/ijeep/article/download/13833/7047/31677>.  
doi:10.32479/ijeep.13833.

This Version is available at:  
<http://hdl.handle.net/11159/593904>

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# The Impact Covid-19 Outbreak, Green Finance, Creativity and Sustainable Economic Development on the Economic Recovery in G20 Countries

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Received: 17 August 2022

Accepted: 13 November 2022

DOI: <https://doi.org/10.32479/ijeeep.13833>

## ABSTRACT

Economic growth has become a global issue, especially after Covid-19, and attain the focus of recent studies and policymakers. A question that repeatedly arises when compulsion of sustainability is sought in a system and economies are obligated to strive for creative outcomes in order to increase economic efficiency. Meanwhile, green financing and sustainable economic development are also expected to be a part of the requirement as they are directly or indirectly indicators of economic growth. Thus, the current research examines the role of the Covid-19 outbreak along with green finance, sustainable economic development and creativity on the economic recovery in the context of G20 economies. This study has used the World Development Indicators (WDI) to extract the data of the selected countries from 2016 to 2020. The present study has also executed the robust standard error along with the fixed-effect model (FEM) to examine the nexus among the variables. The results revealed that green finance (green credit and renewable energy production), sustainable economic development environmental dimension (GHG emissions) and creativity have a positive association with economic growth in G20 countries. These outcomes are suitable for the new researchers while studying this area in the future and helpful for the regulators while developing the regulation related to the economic recovery.

**Keywords:** Covid-19, Green Finance, Creativity, Economic Recovery, Sustainable Economic Development, G20 Countries

**JEL Classifications:** Q01, Q56, F65, G21, Q54

## 1. INTRODUCTION

The Covid-19 pandemic and the ensuing global recession due to the significant drop-in economic activities have reduced fossil-fuel prices. Also, the previously planned investments in renewables, mitigation, environmental preservation, energy efficiency, and green projects are expected to experience downward revisions. The pandemic has had an undesirable influence on the expansion of renewable energy projects, and it made wind, solar and other renewables less competitive (Kot et al., 2021; Kuckertz et al., 2020; Zhao et al., 2022). Haven said before, for the economy to recover, it must be "Green." Green infrastructure will improve productivity,

arrive reclamation occupations to fortify the common environment, and contribute to health systems. It will be difficult, particularly creation on employments, but to dodge more pandemics, we ought to achieve the climate objective to diminish other calamities that will happen within the future (Sadiq et al., 2021).

The Covid-19 widespread may be a worldwide stun "like no other," including synchronous disturbances to supply and demand in an interconnected world economy. On the supply side, diseases diminish work supply and efficiency, whereas lockdowns, commerce closures, and social separating moreover cause supply disturbances (Chien et al., 2021a; Huang et al., 2020; Li et al.,

## 2. LITERATURE REVIEW

2021). On the consumer side, cutbacks and the misfortune of salary (from dreariness, quarantines, and unemployment) and declined financial prospects decrease family utilization and firms' speculation. Our counterfactual investigation focuses on determining the pandemic's negative impacts on the world economy, with no nation getting away unscathed. The Swedish case, in any case, serves as a caution that no economy is safe from the negative results of Covid-19 in an interconnected worldwide economy. Non-Asian rising markets are especially powerless, and Africa poverty begins to ascend on a tremendous scale. Economists believe it will go very positively because it will drive sustainable growth, jobs, and investment; it has to be green (Chien et al., 2021b).

Green financing might advance through changes in countries arrangement of open segment financing decision-making with the natural measurement of the maintainable advance objectives, administrative systems, increments in speculation in clean and green advances, harmonizing open money related motivations, increments in green financing from diverse segments, financing for economic normal resource-based green economies (Ehsanullah et al., 2021; Hsu et al., 2021). The center of today's globalized economy is cash markets through banks and speculators' portion of capital to diverse divisions. United Nations Environment has worked with several nations, monetary controllers, and divisions to adjust financial frameworks to the 2030 economic advancement motivation. Green finance provided by the commercial banks allows the countries to produce renewable energy that enhances economic growth (Sadiq et al., 2021; Wu et al., 2021). In addition, G20 countries also focus on green finance because they consider it the foremost solution to economic recovery in the countries.

The creativeness of the country's environment could play a significant role in economic growth around the globe (Liu et al., 2021; Tan et al., 2021). The research and development resources of the country enhance the creativity and innovation that play a significant role in the growth of the economy. Thus, creativity is attached to the country's research and development (R&D) expenditure in the fiscal year. More R&D expenditure more the creativity in the economy. G20 countries have spent larger amount than the past years on the R&D to bring the creativity in the economy for recovery of the economy (Budiarto et al., 2021; Zhao et al., 2021b). G20 countries also have spent an extensive amount on the research and development expenditure that provides more creativity and innovativeness in the economy that improves economic growth. Creativity also considers the solution to the economic downturn due to the Covid-19 lockdown. Thus, the current study aims to examine the Covid-19 effects on the economy and investigates the green finance and creativity role to recover the economy of G20 countries.

The following section provided the relations among the Covid-19 and economic growth, green finance and economic growth, and creativity and economic growth. The third section provided the methods and data collection of the study, while the fourth section provided the empirical results and the last section provided the discussions of the results and conclusion, policy implication, and limitations of the study.

The effects of the Covid-19 pandemic are disastrous and continue to hold vulnerable States, slowing or reversing economic growth and sustainable development compromising the growth of the global economy. This epidemic has expanded with atrocious speed, contaminating millions and transfer economic activity towards delay as countries forced constricted limitations on movement to halt the expansion of the virus (Coccia, 2021). The panic situation of pandemic and lack of Vaccination injection accessibility worsen the non-public payment with a combined impact of declining financial gain. Service sector, touristy and recreation being affected additional significantly related to community measures and occupation services. Financial gain and job uncertainty are raised due to reduced operating hours, particularly to people who don't haven't any availability to social safety internet. Consequently, the Covid-19 pandemic and, therefore, the succeeding world recession, antecedently planned investments in renewables, environmental preservation, mitigation, energy potency, and inexperienced come are expected to expertise downward revisions (Chien et al., 2021b; König and Winkler, 2020; Sadiq et al., 2022c). The many visits economic activity related to the pandemic has resulted in an exceedingly forceful reduction in fuel costs. This successively encompasses a negative impact on any growth of renewable energy comes and created solar radiation and different renewable less competitive. This poses a significant threat to the palm implementation of the agreement. Accordingly, the new innovative inexperienced finance policies might have to be enforced to limit these adverse effects of the pandemic. These initiatives might embrace the reforming of monetary and monetary policy, and inexperienced infrastructure comes, onerous carbon emissions, at the regional or world level the inexperienced finance innovations and streamlining laws methods that manage inexperienced finance, facilitating the supply of inexperienced bonds, establishing as a collection of standards for inexperienced credit rating (Chien et al., 2021c; Mele and Magazzino, 2021; Sadiq et al., 2022a).

The world is facing a suffering considerable public health crisis and economic disruption because of the Covid-19 outbreak. Quarantines, lockdown and curfew, and widespread restrictions on labor flexibility and travel cutbacks the economic activity in all sectors of the economy. As much time the outbreak persists, the situation becomes worse (Chien et al., 2021d). Subsequent outbreaks around the world would damage more tourism-based economies as air traveling is extensively banned. The supply chain globally disrupts, weaker demand for imported goods and world trade is affecting badly. Financing activities are curbing, with record-low interest rates during the last decade in the US. The confidence of consumers, businesses, and investors has turned down along with increased risk aversion behavior (Li et al., 2021; Magazzino et al., 2021; Sadiq et al., 2022b).

The energy sector is also mainly affected due to this pandemic resulting from the slowing of trade operations, transport, and economic activity. IMF released its economic report on 14 April 2020 and stated that Covid-19 and green finance have a significant impact on the economic activities of all over the world. This will lead to the most significant lockdown recession while green finance

considers the solution to this recession. Due to this pandemic, the universal economy would suddenly contract to 3% of all the advanced economies, and green finance has provided the relief to improve the economy (Destek and Sinha, 2020). While on the other hand, we can see that China and India are expected to grow at 1.2% and 1.9%, respectively, because of preventive measures and choosing the optimum strategy and green finance (Chien et al., 2021e; Chien et al., 2021f; Chien et al., 2021g Rahman and Velayutham, 2020; Zhao et al., 2021b). This downturn has bad outcomes as compared to previous recessions because this pandemic affected the global economy at the peak level. This downturn has led many experts to think and find out how the government of any country can overcome this pandemic come back to a normal situation. Except seeing the bad picture, this pandemic has many opportunities to recover the economy using green finance (Zhou et al., 2020).

On the forefronts of the battle against Coronavirus, renewable energy for homes, and clinical focuses is of foremost significance. Be that as it may, there are 840 million individuals without power, of which 570 million live in sub-Saharan Africa, where a fourth of the facilities have no energy by any means, and 28% of them can't utilize it constantly. Renewable energy can give moderate arrangements that meet environmental objectives and help relieve the Coronavirus emergency's effect on individuals' vocations and neighborhood economies (Abbas et al., 2021; Wei et al., 2021). The "Healthy Sun oriented Project" is principally financed by the Worldwide Asset to battle Helps, tuberculosis, and intestinal sickness. UNDP and its accomplices look to utilize this aptitude to help nations in advancing green energy speculation. Green energy can likewise settle some well-being hazards, making individuals more defenseless to respiratory illnesses, such as Coronavirus. Admittance to energy also makes social arrangements attainable by advancing innovations and hardware that help individuals stay associated. They get data, participate in online training, and work from home. It can likewise give dependable, clean water, which is a critical component in the Coronavirus period.

Green finance in the form of green credit provided by the financial institutions to the organizations and also in the form of renewable energy production would lead the country towards economic growth (Cheba et al., 2020; Haroon et al., 2021; Pilgrimienė et al., 2021). In addition, green finance has played a significant role in the recovery of the economy after Covid-19 lockdown and improved the countries' economic condition. Moreover, a positive association has been observed between the economy's green finance and economic recovery and growth (Bilan et al., 2020; Lv et al., 2021). In addition, a high level of green credit for the organization would produce the high level of economic growth. Moreover, extensive renewable energy production in the country leads the nations towards high economic growth. A study conducted by Zhou et al. (2020) investigated that green finance has positively impacted economic growth. Green finance in the form of green credit is provided to the organization to produce extensive production that leads the organization towards success and moves the economy in a positive way. On the other hand, green finance in the form of renewable energy production is provided to the business organization to compete in the global market and enhance economic growth.

Moreover, in recent times, the existing pile of literature articulates that financial development derives the economic growth (Kamarudin et al., 2021; Khattak et al., 2021). That means financial stability brings the stability in economy. Also, with the focus on sustainable economic development goals, the relationship among green economics and green finances views as an interesting debate across the globe. The reason is that scholars postulate that countries might be able to achieve financial and economic growth while focusing on the prevention of environmental degradation (Hamid et al., 2020; Ainou et al., 2022). Environmental issues such as pollution, ecological imbalance is acknowledged as a global economic and political problems due to the close relation with social development and human survival (Da et al., 2019; Lan et al., 2022). Contrary to conventional approaches, sustainable economic growth considers social responsibility along with environmental protection as a core of the sustainable development, thereby, is appreciated all over the globe as a new growth point and engine to increase economic growth (Ali et al., 2022; Bai et al., 2022; Davis et al., 2006).

It is argued that economic development shares a close association with sustainable development. Economic growth and sustainable economic development supposed to be closely related to each other as both the factors create balance between economic growth and environmental quality (Chien, 2022a; Chien et al., 2022b; Chien et al., 2022c) Generally, green economy is viewed as the foundation of sustainable development while SD in return provide support to economic growth, hence we can say that it is a driving force of economic development. Generally, it is debated that economies that neglect ecosystem results in environmental and social problems with higher percentage. Thereby, financial institutions as well as markets that impact ecological domains must show gratitude towards ecology as it gives them edge to play their social and economic roles efficiently and effectively (Chien, 2022d; Scholtens and Dam, 2007). With this debate, we can say that sustainable economic development is an essential element of economic growth typically for two valid reasons; offers connection among financial development, environmental improvement and economic development and viewing as a novel financial pattern, it couples environmental and social protection with economic profits (Chien et al., 2021g).

The creativeness of the country's environment could play a significant role in economic growth around the globe. A study conducted by Faggian et al. (2017), investigated that the creativeness of the country would lead them towards high economic growth because the innovation brings new ideas that improve the production capacity and improve the country economy. In addition, Lan et al. (2021) also examined the relationships between creativity and economic growth and concluded that economic growth brings through innovation and creativity. The creativity and innovativeness open the door for the country to operate and compete that lead the country towards success and high economic growth. As individuals become more conscious of the importance of a firm's environmental and social performance, technology, procedures, and logistics become more modern, and market rivalry becomes fiercer. Business organizations need creativity to compete against rival enterprises because it allows them to adjust



to changes in technology and market demands. Economic growth depends on the productivity and profitability of individual firms (Shair et al., 2021). So, the creativity of individual firms ultimately enhances the economic growth. The ability of organizational staff to ponder on the old traditions, question them, present new ideas and solutions to critical problems, and find success opportunities out of the difficult situation allows the firm to meet environmental and social requirements of the general public by refining the situation. The high environmental and social performance of the firms improves their productivity and financial performance creating sustainability in the firms' development. The increased performance of individual firms enhances the economic growth (Castillo-Vergara et al., 2018).

### 3. METHODOLOGY

The present research intends to assess the effectiveness of green finance such as green credit and renewable energy production, sustainable economic development such as GHG emission and creativity on the economic recovery of G20 countries. WDI as a source has been used to extract the data of the selected countries from 2016 to 2020. The present study has also executed the robust standard error along with FEM to examine the nexus among the variables. The equation for the study is given as under:

$$EG_{it} = \alpha_0 + \beta_1 GC_{it} + \beta_2 REP_{it} + \beta_3 CR_{it} + \beta_4 CR_{it} + \beta_5 GHG_{it} + \beta_6 PG_{it} + e_{it} \quad (1)$$

Where;

EG = Economic Growth

GC = Green Credit

REP = Renewable Energy Production

CR = Creativity

GHG = Green House Gas emissions

PG = Population Growth

The economic growth has been taken as the dependent variable and measured as the GDP growth. In addition, two predictors have been taken by the researchers to measure green finance such as green credit and REP. Creativity measured as R&D expenditures. Moreover, sustainable economic development is measures as GHG emissions. These measurements are mentioned in Table 1.

Descriptive statistics have been used to examine the mean and standard deviations of the variables and examine the properties of variable along with the normality. A correlation test was also performed in order to check whether the association among variables is strong or weak. Moreover, as multicollinearity is an important factor thereby, it had also been taken care of in current study and VIF test has been conducted to check the multicollinearity issue. The VIF expressions are stated below:

$$R^2_Y \rightarrow Y_{it} = \alpha_0 + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + u_{it} \quad (2)$$

$$j = R_Y^2, R_{X1}^2, R_{X2}^2, R_{X3}^2, R_{X4}^2, R_{X5}^2, R_{X6}^2 \quad (3)$$

$$Tolerance = 1 - R_j^2 \quad VIF = \frac{1}{Tolerance} \quad (4)$$

In addition, the Hausman test was run to select the suitable model. If the probability value is >0.05, then FEM is suitable; otherwise, the random effect is suitable. Thus, based on the Hausman test, FEM is selected, and the equation is given below:

$$Y_{it} = \beta_{1i} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + u_{it} \quad (5)$$

The subscript (i) has shown the "individual country" and made the different countries with respect to their characteristics. The FEM equation with current research variables is mentioned below:

$$EG_{it} = \beta_{1i} + \beta_2 GC_{it} + \beta_3 REP_{it} + \beta_4 CR_{it} + \beta_5 GHG_{it} + \beta_6 PG_{it} + e_{it} \quad (6)$$

### 4. RESULTS

As discussed earlier, descriptives were used to assess the data in order to gauge the properties of variables such as minimum, maximum, mean values etc. From Table 2, the visible figures depict that economic growth has a mean value of 12.638 whereas renewable energy production's value is 0.624. As far as other constructs are concerned, green credit's value is 1.225 following creative 1.282 and GHG emission 1.345. Finally, the average value of control variable that is population growth is 5.231. These figures are mentioned in Table 2.

Moreover, a correlation matrix has also been performed by the researchers as stated earlier to investigate the relationship among chosen variables. Since all of the values are positive (Table 3), especially in relation to economic growth, that shows that variables go in same direction as of economic growth. This shows the strong association among constructs, that further elaborates that higher level of creativity, GHG emissions, renewable energy production, population growth and green creativity results in higher economic growth.

**Table 1: Measurements of variables**

S#	Variables	Measurements
01	Economic Growth	GDP growth (annual %)
02	Green Credit	Green credit provided by the financial sector (% of GDP)
03	Renewable Energy Production	Renewable energy output (% of total energy output)
04	Creativity	Research and development expenditures (% of GDP)
05	GHG emissions	GHG damages (% of GNI)
06	Population Growth	Population growth (annual %)

**Table 2: Descriptive statistics**

Variable	Obs	Mean	SD	Min	Max
EG	100	12.638	17.712	4.380	25.330
REP	100	0.624	0.491	0.179	0.709
GC	100	1.225	0.169	0.645	1.668
CR	100	1.282	1.201	0.528	4.743
GHG	100	1.345	1.201	0.678	3.567
PG	100	5.231	0.812	3.213	6.399

In addition, VIF has also been run to examine the multicollinearity assumption. The statistics exposed that the values of VIF are lower than five that exposed the no multicollinearity issue. These figures are mentioned in Table 4.

In addition, the Hausman test was run to select the suitable model. If the probability value is  $>0.05$ , then FEM is suitable; otherwise, the random effect is suitable. The results indicated that the probability value is lower than 0.05, which shows FEM is appropriate. These values are shown in Table 5.

Firstly, FEM is run to assess the relationships, obtained results disclose that green credit and renewable energy production, creativity, and population growth have a positive association with economic growth in G20 economies. Moreover, 66.0% of changes in the economic growth are due to all predictors and control variables. These links are highlighted in Table 6.

From Table 6, results revealed that green finance (green credit and renewable energy production), creativity, GHG emissions and population growth have a positive association with economic growth in G20 countries as P-values are  $<5\%$ . This shows that economic growth increases where there is a increase in renewable energy production, green credit, creativity and GHG emission.

**Table 3: Matrix of correlations**

Variables	EG	REP	GC	CR	GHG	PG
EG	1.000					
REP	0.635	1.000				
GC	0.361	0.296	1.000			
CR	0.790	0.392	0.377	1.000		
GHG	0.456	-0.346	-0.231	0.012	1.000	
PG	0.276	0.365	-0.493	0.110	0.461	1.000

**Table 4: Variance inflation factor**

	VIF	1/VIF
GC	2.332	0.429
PG	2.243	0.446
REP	1.791	0.558
CR	1.368	0.731
GHG	2.564	0.390
Mean VIF	2.0596	

**Table 5: Hausman test**

	Coef
Chi-square test value	8.627
P-value	0.041

**Table 6: Fixed effect model**

EG	Beta	SD	t-value	P-value	L.L.	U.L.	Sig
REP	8.259	3.133	2.64	0.010	2.019	14.499	**
GC	39.623	11.615	3.41	0.001	16.490	62.755	***
CR	10.328	1.444	7.15	0.000	7.452	13.203	***
GHG	23.231	1.451	6.21	0.002	6.125	12.182	***
PG	2.228	0.509	4.38	0.000	4.720	19.175	***
Constant	14.220	4.589	3.09	0.003	3.026	14.586	***
R-squared	0.660		Number of obs			100	
F-test	36.874		Prob>F			0.000	

\*\*\*P<0.01, \*\*P<0.05, \*P<0.1

GHG emissions also causes increment in economic growth because there are normally generated when countries primarily focus on industrialization in order to increase fastest economic development means the more the % of industries increase the more the share of emissions increase, hence prove that GHG emissions are positively correlated with economic growth.

## 5. DISCUSSION

The study findings have indicated that green credit which is an effective dimension of green finance is positively correlated with economic growth. This posits that in a country where the atmosphere is clean and the environment is less polluted, all the sectors of the economy make rapid progress as the healthy environment provides a healthy workforce and quality resources. Thus, the green credits, whose objective is to provide funds for ecological-friendly projects, lead the economy towards high growth. Findings are consistent with Zhang et al. (2021), which examines the green finance dimensions, like green credits, green securities, green bonds, and green investment, and their role in economic growth. This study concludes that when financial institutions grant green credits on easy conditions and procedures, the business organizations have sufficient financial resources which they may spend on making green improvements in the technologies applied in the business processes. Such technologies produce good quality resources, cause minimum wastes, and give more productivity which is helpful to the economy is recovering from crisis or pandemic like covid-19. The study results have also indicated that the investment in renewable energy resource production has a positive association with the economic growth of the country. These results are supported by the past study of Zhou et al. (2020), which analyzes green finance and its contribution to environmental quality and economic development. This study suggests that the economies where the commercial institutions, whether they deal in finance or not, make an investment in renewable energy production like wind energy, solar power, hydropower, biomass, and biofuel, have more chance to recover from health crises like a pandemic because the production of renewable energy absorbs the excessive heat and waters from the environment and clean it. Findings are consistent with Kirikkaleli and Adebayo (2021).

Findings reveal that that GHG emissions has a significant impact on economic growth. The findings are consistent with prior literature in case of environmental dimension as studies postulate that financial stability through industrialization brings the stability in economy. The results are consistent with existing pile of literature which articulates that economic growth is positively correlated with GHG emissions (Balibey, 2015; Chaabouni and Saidi, 2017; Liu et al., 2022b; Muhammad, 2019). However, with some of the studies the results contradict such as the study of Kasman and Duman (2015), which proclaims that GDP and CO<sub>2</sub> share depressing effect. Interestingly, there exist another series of literature too which finds no significant association (Acheampong 2018; Gorus and Aydin, 2019; Liu et al., 2022a; Salahuddin and Gow, 2014). Consistent with the series of literature, the evidences are justified as with the increase in economic activity in order to increase economic growth, the environment gets compromised

which causes high emissions. Moreover, as the industries cause high emissions but are equally important for higher economic growth, this is why we can say that economic growth at the expense of environment seems to be unsustainable. However, the point could be justified through lens of contradicting evidences that the rise in emissions substantially grow economies to a certain point and reaching the threshold, it begins to fall. Thus, we may postulate that at early stages GHG emissions and economic growth share positive relationship but the relation may inverse at certain level, making it realize that in order to gain continuous progress in economy, there is a need to have sustainability. The same argument is proposed by Marjanović et al. (2016), who explains that GHG emissions play a central role in global warming and economic growth. This complex situation creates an inseparable link which may act as a barrier between economic and environmental policies.

This study focuses on both renewable energy consumption and production for achieving business effectiveness and economic goals. The study implies that the use of renewable energy resources for meeting energy needs keeps the work environment which provides good quality products in maximum quantity and high environmental performance raise the marketing. On the other hand, the production of renewable energy reduces the already spreading pollution from the atmosphere like excessive heat and water and thereby keeps the environment safe, secures natural resources and skilled labor force for future economic use. Thus, it sustains economic growth. The study results have also indicated that creativity development has a positive association with the economic growth of the country. These results are in line with the previous study of Umar et al., (2020), which shows the importance of innovation and creativity in the business world. This study elaborates that now in this modern age, people want something new or extraordinary to fulfill their needs in a better way or satisfy their social prestige. So, there is a need for creative skills which can motivate the employees to analyze the changes in the market requirements and customers' needs and respond to these changes bring innovation to the business functioning. Thus, the economy grows with the business progress. These results are also supported by the previous study of Arslan et al. (2021), which states that the creative skills such as deep observation, quick analysis, ability to find a solution to, and opportunities out of problems enable the employees to find the factors causing the pollution spreading or health disasters and find out the ways to tackle with the effects of disasters. Thus, the creativity in the employees helps the economy recover the disasters. The study results have also indicated that population growth has a positive association with the economic growth of the country. The past study of Chang and Chen (2020) supports the current results. According to this study, an increase in the population creates environmental and economic problems for the countries because it causes an increase in CO<sub>2</sub> through respiration and the usage of different products for domestic and commercial purposes. Moreover, for the increased population, there is needed more productivity and more employment opportunities, which affect the economy and again the environmental quality.

The study carries theoretical as well as empirical implications. This study makes considerable additions to the literature on business

sustainability. The study focuses on the green credit renewable energy production, creativity, and population growth and their influences on the economic growth of the country during crises or pandemics like covid-19. The role of green finance and creativity in getting the high business performance and share in the economic growth have long been researched and debated among researchers and scholars, but these topics have been discussed separately in the existent literature. This study deals with the economic recovery through green development for the period of covid-19, which is something new in the literature. G20 countries are selected as the center of analysis for the association of green credit renewable energy production, creativity, and population growth with the economic recovery and growth. It is also a great contribution to the literature. This study is considered significant to the economists and policymakers both at the private and government level. It creates convenience for them in forming policies to overcome crises or some pandemic like covid-19 by elaborating the ways to accelerate economic growth. This study has importance in practical life like in G20 countries and many others because of the provision of its guidance to enhance economic growth. The study suggests that the effective implementation of green perspective into the policies, the choice of renewable energy production, development of creativity, and management of population growth help to do planning for the economic recovery.

## 6. CONCLUSION

The main objective behind the conduct of this study was to clear the ways for the government and economists in the selected countries to have fast economic recovery from critical situations like crises or pandemics. The primary focus of the research through the conduct of this study was to explore how effective the role the green finance like green credit, renewable energy production, creativity development, and management of population growth in getting economic recovery and economic growth. The authors made an analysis of the effectiveness of the role of green finance with the dimension of green credits and investment on renewable energy production and creativity development along with the administration of population growth in getting quick recovery through cross panel data collected from G20 economies. The analyzed quantitative data help extract suitable findings for understudy constructs. These results showed the positive association of green finance like green credit, investment in renewable energy production, creativity development, and population growth administration with economic development. The results indicated that the issuance of green credit motivates the commercial units to turn their attention to the environmental aspects of the economic activities, which remarkably accelerates economic growth. The study results showed that the investment in renewable energy production saves the environment from pollution and gives rise to the use of safe energy resources, which prevent the economy from pollutants and accelerates the gross domestic product. The development of creativity in the employees creates the ability in them to handle health issues, pollution problems, and crisis attacks to carry the economic activities in a smooth manner. The study results also highlighted that the proper administration of the population growth could be fruitful for protecting the economy against the critical situation.



This paper carries several limitations which may weaken this study but provides a motivation for the researchers to show their intelligence to replica this study in a better way. This study highlights the impacts of green finance like green credit, investment in renewable energy production, creativity development, and population growth administration on economic growth. Economic growth is a very broad aspect that covers many factors like organizational elements, human resources, and technologies, etc. But these factors have no place in the study, which has limited the scope of the study. The authors must focus on these factors too to expand the scope of the study. The studies have analyzed the relationship of green finance like green credit, investment in renewable energy production, creativity development, and population growth administration with the economic development for the G20 countries, which are mostly developed or developing with upper-middle-income economies. Thus, the study is not equally appropriate for all the economies. The study lacks generalizability which must be improved by the authors in the future.

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