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Country Risk and Sustainable Development: Mediating Role of Economic Growth

Fiaz Ahmad Sulehri[1], Amjad Ali[2], Mehboob Alam[3]

Abstract
Sustainable development is of great significance for present and future generations. This study examines the mediation role of economic growth on sustainable development through country risk. We have employed the structural equation modeling (SEM) technique to examine the direct and indirect effects of exogenous and endogenous variables. We conducted this analysis using a sample of 24 countries that contributed approximately 65% of global greenhouse gas (GHG) emissions from 2000 to 2019. The empirical analysis based on direct effects establishes that country risk reduces economic growth and sustainable development. Interestingly, the empirics of indirect effects reveal that country risk has a positive and significant indirect impact on sustainable development by using economic growth as a mediator. Moreover, the negative direct effect of country risk on sustainable development is greater than the total negative effect due to the positive indirect effect. Finally, policymakers should minimize country risk to promote economic growth, ensuring environmental, social, and economic sustainability for the safety of current and future generations.
Keywords: Country Risk, Economic Growth, Sustainable Development, Structural Equation Model

1. Introduction

The Earth's temperature has witnessed a steadily increasing trend due to the emission of greenhouse gases during the last 70 years (Audi et al., 2020; Balaram, 2023). The average global temperature on Earth has increased by at least 1.9° Fahrenheit (1.1° Celsius) since 1880, as per NASA's Goddard Institute for Space Studies (GISS). The idea of sustainable development, emerging notably in the 1970s and 1980s, revolves around responsible behavior that ensures the long-term utilization of resources without compromising the needs of future generations (Paul, 2008). In the current era, every nation has gradually prioritized sustainable development along with maintaining a stable macroeconomic environment. However, chasing sustainable development has a lot of challenges, including political and socioeconomic instability and rising environmental degradation leading to disasters (Audi & Ali, 2018; Ali et al., 2021; Glasser et al., 2022). Human activities have a direct and significant impact on the environment, jeopardizing the survival of the planet and the well-being of future generations. Consequently, there's a pressing need for behavioral adjustments aimed at rational and efficient resource management to achieve economic stability and mitigate environmental degradation, thus fostering sustainable development (Chu & Karr, 2017; Ali et al., 2021; Markanday & Galarraga, 2022).

Sustainable development refers to socio-economic growth within ecological limits, equitable resource distribution, and the utilization of resources in a manner that ensures the well-being of future generations (Davies, 2013; Ali & Audi, 2016; Audi & Ali, 2017). In addition to this, the triple bottom line concept emphasizes balancing the environmental, economic, and social sustainability pillars. Environmental sustainability ensures the quality of the environment for economic activities and enhances people's quality of life, while economic sustainability entails long-term growth without adverse environmental impacts (Ali et al., 2022; Audi & Ali, 2023). Social sustainability advocates for human rights, equality, cultural identity preservation, and diversity (Brundtland, 1987). Maintaining a balance among these pillars is crucial for sustainable growth, yet challenging, as each pillar must respect the interests of the others to prevent imbalances. Ecological sustainability, in particular, is pivotal for the overall development process (Audi & Ali, 2023; Mangukiya & Sklarew, 2023; Carter & Rogers, 2008; Jenkins & Bauman, 2010; Ali & Rehman, 2015; Ali, 2015; Klarin, 2018).

By considering serious consequences, the United Nations formulated the Millennium Development Goals (MDGs) in September 2000 to address global poverty and critical issues by 2015. These goals include the eradication of poverty, achieving universal primary education, promoting gender equality, reducing child mortality, improving maternal health, combating diseases, ensuring environmental sustainability, and fostering global partnerships (Pogge, 2004). Following the MDGs, the United Nations introduced the "2030 Agenda for Sustainable Development Goals" in September 2015, aimed at comprehensive action for sustainable development, encompassing well-being, environmental preservation, universal peace and partnership, poverty eradication, and transformative measures for a sustainable future (Johnston, 2016).

The realization of sustainable development demands a lot of determinants, of which the most important is economic growth, as it acts as a substance for progress, rendering the required infrastructure and resources to address economic, social, and eventually environmental challenges (Adamowicz, 2022; Ali et al., 2023). Sustainable development promotes a balanced approach where there is a need to give equal importance to economic, social, and environmental sustainability (Peiró-Signes et al., 2022). Pursuing economic growth should not come at the cost of social inequalities and environmental degradation. There may be a lot of determinants of economic growth, like the timely provision of human and physical capital, technological progress, efficient

[1] PhD Scholar, Lahore School of Accountancy and Finance, The University of Lahore, Pakistan
[2] Associate Professor, Lahore School of Accountancy and Finance, The University of Lahore, Pakistan, chanamjadali@yahoo.com
[3] Associate Dean, Lahore School of Accountancy and Finance, The University of Lahore, Pakistan

utilization of natural resources, financial development, etc., but a country's risk plays a very important part in deciding the country's growth. It refers to political instability, the absence of social unrest and terrorism, economic volatility, and environmental vulnerabilities that ultimately have a direct or indirect effect on sustainable development (Eisenmenger et al., 2020).

Investors' confidence, foreign capital inflow, domestic entrepreneurship, economic expansion, and job creation are directly influenced by the country's risk. However, minimizing a country's risk through a robust regulatory framework and governance mechanisms promotes a conducive environment for economic growth and sustainable development (Alola & Ozturk, 2021; Sulehri & Ali, 2020: Audi et al., 2023; Sulehri et al., 2023) . The major focus of this study is to examine different pathways to sustainable development and the complex relationships among country risk, economic growth, and sustainable development. This research aims to investigate how country risk influences the outcomes of sustainable development, with the mediating role of economic growth. Through empirical analysis, this research seeks to contribute insights into the complex relationship of these factors, shedding light on their role in shaping sustainable development paths.

2. Literature Review

Fundamentally, the notion of sustainable development is based on socioeconomic and financial development, with some consistent ecological restrictions and the redistribution of resources to ensure the quality of life for present and future generations (Sharpley, 2000). Following the triple bottom line idea, there are three pillars to sustainability, i.e., environmental sustainability, social sustainability, and economic sustainability (Brundtland, 1987; Carter & Rogers, 2008; Jenkins & Bauman, 2010; Klarin, 2018). There is a possibility of an uneven balance among the pillars of sustainable development, where one pillar may be stable while others may be unstable, particularly in the context of ecological sustainability (Rubin, 1999; Davies, 2013).

Stoenoiu (2022) investigates the indicators of Sustainable Development Goal No. 9, which include achieving sustainable industrialization, increasing research and innovation, and creating a resilient infrastructure. In the empirical analysis, only nine indicators were used to measure the situation of eight Eastern European countries during 2013–2019 to signal improvements or deteriorations in situations. After empirical results, countries' ranking categories were obtained as real, moderate, and low progress toward sustainable development.

Kyriacou (2022) mentions that gross domestic product, fiscal policy, monetary policy, economic misery, and exchange rates influence the macroeconomic environment. However, Okunbanjo et al. (2022) and Caro (2017) investigate the macroeconomic environment's characteristics and the availability of small business loans in Nigeria. The study employs a longitudinal research approach using secondary data sources and robust least squares statistical analysis. The data indicate that the exchange rate has no substantial effect on small business credit, but the lending rate and liquidity ratio have significant impacts. The study shows that lending rate and liquidity ratio are the factors and predictors of credit to small businesses in Nigeria. Therefore, the study suggests that the Nigerian economic growth controllers should take action to stabilize the country's foreign exchange.

Li (2023) conducts a comparison of the macroeconomic circumstances and monetary, fiscal, and trade policies of China and the United States. The author talks about how the new Tesla Model 3 might do better in China than in the US. Although the US-China trade war has somewhat increased the Model 3's price, expanding the Giga plant in China could potentially resolve these issues by lowering taxes and fees. Both the US and China have a stable and healthy macroeconomic environment for investors like Tesla, according to data from 2010 to 2019. In conclusion, China has a greater comparative advantage due to its higher GDP growth rate, well-maintained interest rate, and easing monetary policy, all of which promote business activity and are anticipated to accelerate economic growth.

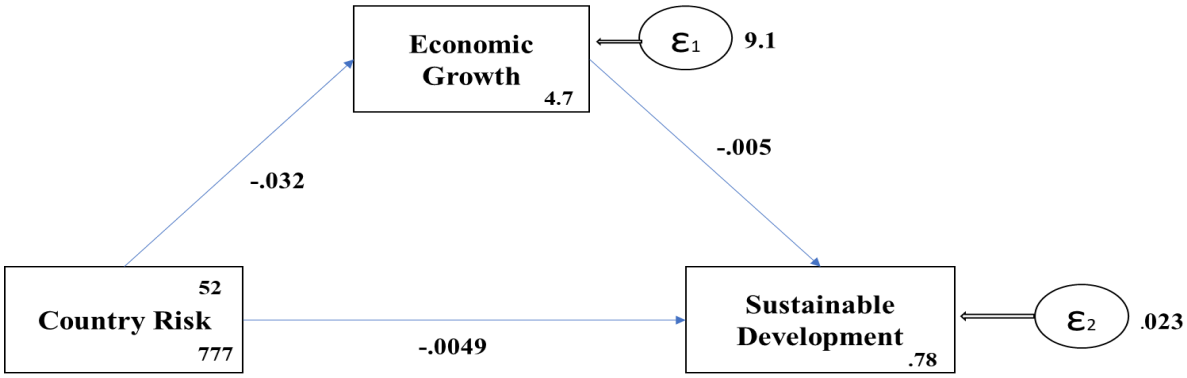
To clarify the relationship between the macroeconomic environment and tax income, Ali and Audi (2018) analyze the impact of economic indicators on Pakistan's tax revenue from 1975 to 2016. The results of the study are quite fascinating, as unemployment has a positive and significant effect on tax income. In Pakistan, the link between money supply and tax revenues is positive and considerable, whereas the association between inflation and tax revenues is negative and significant.

While investigating the use of country risk, Hoti et al. (2002) investigate the use of country risk and present an international comparison of country risk ratings using data compiled by the International Country Risk Guide (ICRG), a recognized comprehensive and consistent source of monthly ratings for numerous countries. The writers create a multivariate asymmetric ARMA-GARCH model with a constant correlation and look at its basic features, such as its unique, strictly stationary, and ergodic solution. Comparing conditional means and volatilities in international country risk returns across countries and over time using empirical findings proves the models' assumptions to be correct and shows how important economic, financial, and political risk ratings are as parts of composite risk ratings.

3. Theoretical and Conceptual Framework

The concept of sustainable development emerged in the late 1970s and raised concern about how economic growth impacts environmental degradation and social inequalities. Various disciplines, including economics, ecology, sociology, and political science, contribute to its theoretical foundation. Holling (1973) presents resilience theory and explains how systems might adapt to shocks like climate change and natural disasters. But Brundtland (1987)

provides three pillars for sustainability, i.e., economic development, environmental protection, and social equity, to consider in the "Our Common Future" report produced for the World Commission on Environment and Development. Later, Wackernagel and Rees (1998) point out how ecological footprints link the utilization of natural resources with waste absorption. Following Holling (1973), Brundtland (1987), Wackernagel and Rees (1998), (Hassan et al., 2021), (Eisenmenger et al., 2020), and (Sulehri, 2024) the conceptual model of this study becomes:



Following the theoretical and conceptual ideologies, the mediation econometric models can be written as:

$EG_{it} = \beta_0+\beta_1 CR_{it} + \varepsilon_{it1}$ (1)

$SD_{it} = \delta_0+\delta_1 EG_{it} + \varepsilon_{it2}$ (2)

$SD_{it} = \gamma_0+\gamma_1 CR_{it}+ \gamma_2 EG_{it} + \varepsilon_{it3}$ (3)

SD= Sustainable Development
CR = Country Risk
EG = Economic Growth

3.1. Measurement of Variables

The detailed measurement methodologies and formulas of the sustainable development index and ecological impact index have been given as follows:

3.1.1. Sustainable Development Index

It is a measure of the ecological efficiency of human development, considering that the optimal level of development must be achieved within planetary boundaries. To calculate the sustainable development index, the human development index has been divided by the ecological impact index. The human development index includes a life expectancy index, an education index, and an income index with a sufficiency threshold.

To measure sustainable development, the following formula has been used to construct a sustainable development index.

$$SDI = \frac{\text{Development Index}}{\text{Ecological Index}}$$

3.1.2. Ecological Impact Index

$$\text{Ecological Impact Index} = 1 + \frac{e^{AO} - e^{1}}{e^{4} - e^{1}}$$

If AO is greater than 4, then EII = AO – 2

$$\text{A0} = 2\sqrt{\left(\frac{MF}{\text{Boundary}} \geq 1\right) * \left(\frac{CO2}{\text{Boundary}} \geq \text{I}\right)}$$

Material footprint=MF
CO2=Carbon emission
AO=Average overshoot
e=exponential function

This strategy assures that the SDI is a reliable predictor of long-term sustainability. Countries cannot utilize low ecological impact to compensate for poor human development performance. Data for the components of the development index has been taken from the United Nations Development Programme; data for material footprint has been taken from the UN International Resource Panel Global Material Flows Database; and for CO2 emissions, the data has been taken from the EORA MRIO database with PRIMAP (Hickel, 2020).

3.1.3. Economic Growth

It is considered the increase in an economy's production and consumption of goods and services over time. Changes in the gross domestic product (GDP), which measures the total value of a country's goods and services, typically assess economic growth. The data for economic growth has been taken from the World Bank database.

3.1.4. Country Risk

It refers to the overall economic, financial, political, and social risks associated with doing business or investing in a particular country, considering factors such as political stability, financial instability, and the absence of violence, terrorism, and social unrest. The data for country risk has been taken from the World Bank.

3.2. Empirical Methodology

Karl Gustav Joreskog, a prominent Swedish statistician, introduced the concept of structural equation modeling (SEM) in 1969. Structural equation modeling (SEM) is a comprehensive statistical method for examining the complex relationship among variables in the social sciences (Jöreskog, 1969). We have used the following twenty-four countries, which contribute around 65% of global greenhouse gas emissions, for empirical analysis in this research. Those countries include the United States, the United Kingdom, Japan, Germany, Switzerland, Hong Kong, Singapore, France, Canada, Australia, China, South Korea, India, Brazil, Mexico, Russia, Netherlands, Italy, Spain, South Africa, Indonesia, South Arabia, Turkiye, Poland, Pakistan, and Argentina. Furthermore, we collected data from 2000 to 2019, before the COVID-19 pandemic. In this research paper, structural equation modeling (SEM) is used to understand the empirical relationship between exogenous variable country risk, endogenous variable economic growth and sustainable development, and mediating variable economic growth. We have employed different techniques such as the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standard root mean square residual (SRMSR) to check the goodness of fit of the model (Jenatabadi, 2015; Cain, 2021).

4. Results and Discussions

In Table 1, the results of the structural equation modeling (SEM) reveal several significant relationships among the key variables like economic growth, country risk, and sustainable development, as hypothesized in the study. In countries with great political instability, regulatory uncertainty, macroeconomic volatility, and an increased number of events of violence and terrorism, investors and entrepreneurs will be more cautious, leading to decreased investment and fewer economic activities. However, high levels of country risk can discourage foreign capital inflows as well as domestic entrepreneurial and commercial activities, ultimately reducing economic growth. Firstly, the empirical analysis demonstrates a negative relationship between country risk and economic growth, with a coefficient value of -.0320275 and a p-value of 0.000 highly significant, indicating that country risk reduces economic growth due to shaking off investors' confidence and reduces economic activities. It also highlights the importance of mitigating country risk for sustainable economic growth (Hassan et al., 2021).

Table 1: Structural Equation Model

Endogenous Variables
Observed: EG, SD
Exogenous Variable
Observed: CR
Number of Observations = 480
Estimation Method = Maximum Likelihood
Log-likelihood = -3263.7057

	Coefficient	OIM Std. Error	Z	P>|z|	[95% Conf.	Interval]
Structural						
EG <-						
CR	-.0320275	.0049418	-6.48	0.000	-.0417133	-.0223417
Cons	4.689039	.2899471	16.17	0.000	4.120753	5.257325
SD <-						
EG	-.0049719	.0022864	-2.17	0.030	-.0094532	-.0004906
CR	-.004935	.0002582	-19.12	0.000	-.005441	-.0044291
Cons	.7791194	.0180527	43.16	0.000	.7437367	.8145021
Var (e.EG)	9.105473	.5877558			8.023386	10.3335
Var (e.SD)	.0228486	.0014749			.0201333	.0259301

In addition to this, economic growth is considered a driver of human development, but higher economic growth may not always promote sustainable development due to a lower focus on environmental sustainability, social inequalities, and institutional capacity building. The empirical result reveals a statistically significant negative relationship between economic growth and sustainable development with a coefficient value of -.0049719 and a p-value of 0.030, indicating that lower considerations of ecological limits and environmental sustainability reduce sustainable development (Mushafiq & Prusak, 2023). Furthermore, country risk pertains to political unrest, inadequate regulatory frameworks, inconsistent economic policies, and the existence of violence and terrorism activities, which may decrease investment in renewable energy, ecosystem management, and social welfare programs. Due to less investment in renewable energy and reduced social welfare programs, there is an increase in environmental degradation and social inequalities. So, statistical analysis shows a highly significant and negative association between country risk and sustainable development, with a coefficient value of -.004935 and a p-value of 0.000, indicating that country risk reduces sustainable development (Peiró-Signes et al., 2022). To formulate policies, all stakeholders and policymakers should consider these results before adopting a comprehensive approach that includes economic, social, and environmental aspects.

By using structural equation modeling (SEM), we find that no indirect relationship exists between country risk and economic growth. However, there is a negative direct relationship between country risk and economic growth, highlighting the importance of mitigating country risk for sustainable economic growth. In this way, country risk reduces economic growth, leads to fewer greenhouse gas emissions, lowers environmental degradation, and eventually promotes sustainable development. The empirical results show in Table 2 that there is a positive and significant indirect impact of country risk on sustainable development by using economic growth as a mediator, with a coefficient value of 0.0001592 and a p-value of 0.000, indicating country risk reduces economic growth, resulting in less industrialization and lower emissions of greenhouse gases, ultimately promoting sustainable development (Peiró-Signes et al., 2022; Hoti et al., 2002). Country risk has both direct and indirect influences on sustainable development, indicating partial mediation between country risk and sustainable development. However, it is recommended that policymakers and authorities focus on the mitigation of country risk, which leads to high economic growth, with a special focus on environmental, social, and economic sustainability.

Table 2: Indirect Effects

	Coefficient	OIM Std. Error	Z	P>|z|	[95% Conf.	Interval]
Structural						
EG <-						
CR	0	(no path)				
SD <-						
EG	0	(no path)				
CR	.0001592	.0000772	2.06	0.039	7.85e-06	.0003106

The total effect is the combination of a direct effect with a negative coefficient value of -.004935 and an indirect effect with a positive coefficient of .0001592. Table 3 shows the total effect of country risk on sustainable development, with a negative coefficient value of -.0047758 (-.004935+.0001592) and a p-value of 0.000, which indicates that a higher level of country risk reduces sustainable development. However, the direct effect of country risk on sustainable development is greater than the total effect due to the positive indirect effect. Finally, it is recommended that policymakers minimize country risk in a way that promotes economic growth with an ultimate focus on environmental, social, and economic sustainability to ensure the safety of current and future generations (Peiró-Signes et al., 2022; Hoti et al., 2002).

Table 3: Total Effects

	Coefficient	OIM Std. Error	Z	P>|z|	[95% Conf.	Interval]
Structural						
EG <-						
CR	-.0320275	.0049418	-6.48	0.000	-.0417133	-.0223417
SD <-						
EG	-.0049719	.0022864	-2.17	0.030	-.0094532	-.0004906
CR	-.0047758	.0002488	-19.20	0.000	-.0052634	-.0042882

Table 4 shows the results of the overall goodness of fit, in which the Root Mean Squared Error of Approximation (RMSEA) value of 0.000 less than 0.05 indicates excellent fit of the model. The Comparative Fit Index (CFI) value is 1.000, and the Tucker-Lewis Index (TLI) value is also 1.000. Both values are equal to 1, indicating a good fit of the model, which means the specified model fits the data well. The Standardised Root Mean Squared Residual (SRMR) value is 0.000, which is well below the threshold of 0.05, suggesting a good fit in terms of residual variability (Jenatabadi, 2015).

Table 4: Overall Goodness of Fit

Fit Statistic	Value	Description
Population error		
RMSEA	0.000	Root mean squared error of approximation
90% CI, lower bound	0.000	
upper bound	0.000	
pclose	1.000	Probability RMSEA <= 0.05
Baseline comparison		
CFI	1.000	Comparative fit index
TLI	1.000	Tucker-Lewis index
Size of residuals		
SRMR	0.000	Standardized root mean squared residual
CD	0.478	Coefficient of determination

5. Conclusions

This research article presents different paths to sustainable development and investigates the complex relationship among country risk, economic growth, and sustainable development. In the beginning, the study confirms that countries with great political instability, regulatory uncertainty, macroeconomic volatility, and an increased number of events of violence and terrorism will be more cautious, leading to decreased investment and fewer economic activities. However, high levels of country risk can discourage foreign capital inflows and domestic entrepreneurial and commercial activities, ultimately reducing economic growth. In addition to this, economic growth is considered a driver of human development, but higher economic growth may not always promote sustainable development due to a lower focus on environmental sustainability, social inequalities, and institutional capacity building. There is a statistically significant negative relationship between economic growth and sustainable development, indicating that lower considerations of ecological limits and environmental sustainability reduce sustainable development. Furthermore, country risk pertains to political unrest, inadequate regulatory frameworks, inconsistent economic policies, and the existence of violence and terrorism activities, which may decrease investment in renewable energy, ecosystem management, and social welfare programs. Due to less investment in renewable energy and reduced social welfare programs, environmental degradation and social inequalities are increasing. So, statistical analysis shows a highly significant and negative association between country risk and sustainable development, indicating that country risk reduces sustainable development. By using structural equation modeling (SEM), there is a negative direct relationship between country risk and economic growth, highlighting the importance of mitigating country risk for sustainable economic growth. It is concluded that country risk reduction leads to fewer greenhouse gas emissions and lower environmental degradation, eventually promoting sustainable development. There is a positive and significant indirect impact of country risk on sustainable development by using economic growth as a mediator, indicating that country risk reduces economic growth, resulting in less industrialization and lower emissions of greenhouse gases, ultimately promoting sustainable development. With the indirect positive relationship between country risk and sustainable development, it will not be recommended to increase political instability and violent events because the total effect of country risk on sustainable development is still negative and significant. Country risk has both direct and indirect influences on sustainable development, indicating partial mediation between country risk and sustainable development by using economic growth as a mediator. Furthermore, the direct effect of country risk on sustainable development is greater than the total effect due to the positive indirect effect. Finally, it is recommended that policymakers minimize country risk in a way that promotes economic growth with an ultimate focus on environmental, social, and economic sustainability to ensure the safety of current and future generations.

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