Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Policy Journal of Social Science Review

Let's Start!

Analyzing the Impact of Renewable Energy, Financial Development, FDI, and Economic Growth on CO_2 Emissions in Emerging Economies

Muhammad Usman[1]
Dr. Yousaf Khan[2*]
Iqra Bashir[3]
Muhammad Waseem Arshad[4]
Asifzeb[5]

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Analyzing the Impact of Renewable Energy, Financial Development, FDI, and Economic Growth on CO_2 Emissions in Emerging Economies

Muhammad Usman	Student, School of Economics, BZU Multan
Dr. Yousaf Khan	National University of Modern Languages (NUML) Regional Campus Peshawar. Corresponding Author Email: ykhan@numl.edu.pk & Orcid: https://orcid.org/0000-0001-5698-3497
Iqra Bashir	Student, School of Economics, BZU Multan
Muhammad Waseem Arshad	NUML.
Asifzeb	Student of Abdul Wali Khan University Mardan (AWKUM)

Abstract

Purpose: This study explores the impact of economic growth (GDP), Renewable Energy Consumption (REC), Financial Development (FD), and FDI on Environmental Quality in 70 developing economies, with the goal of evaluating the balance between economic progress and environmental sustainability. Methodology: The study uses panel cointegration analysis on data from 2022 to 2023 sourced from the World Bank's WDI database to identify long-term relationships between the variables and provide insights into their interdependencies. Findings: The findings show a strong positive correlation (0.920) between Economic Growth (GDP) and CO2 emissions, indicating significant environmental costs of growth. Financial Development also correlates positively with CO2 emissions, suggesting its role in environmental degradation. In contrast, Renewable Energy Consumption and FDI have weak to negative correlations with CO2 emissions, reflecting their limited current impact on emissions reduction. However, the results highlight the potential of renewable energy to mitigate the environmental effects of financial growth, emphasizing its importance for sustainable development. Originality: This research provides a unique empirical analysis of the interaction between economic and environmental variables in emerging economies using robust methodologies and a large dataset. Implications: The study highlights the need for sustainable energy policies, increased investments in renewables, and eco-friendly financial strategies to harmonize economic growth

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

with environmental preservation. Limitations: Key constraints include limited data availability for 70 economies, contextual variability among countries, and the inability to capture short-term dynamics or policy impacts. Future Directions: Future research should include more countries, use dynamic models for short-term policy analysis, explore sector-specific effects of FDI and financial development, and assess renewable energy policies to develop global best practices.

Keywords: FDI, Economic Growth, Financial Development, Renewable Energy Consumption, Environmental Quality, CO2 Emissions, Emerging Economies, Panel Cointegration Analysis

INTRODUCTION

Environmental quality has emerged as a critical global issue in the 21st century, particularly for emerging economies that are handling with the twofold challenges of sustaining economic growth (EG) and addressing environmental degradation. Rapid industrialization, urbanization, and globalization have spurred economic activities in these economies, often at the expense of environmental sustainability (Solaymani & Montes, 2024; Wei, Mohsin, & Zhang, 2022). Understanding the determinants of environmental quality is therefore vital to achieving long-term sustainable development goals in these nations. This study examines the impact of economic growth, financial development, renewable energy consumption, and foreign direct investment (FDI) on environmental quality in emerging economies, employing a panel Cointegration analysis to uncover long-run relationships.

Economic growth has traditionally been viewed as a carter of environmental-degradation, particularly in the primary stages of improvement once industrialization and resource exploitation are prioritized over environmental considerations. The Environmental Kuznets Curve (EKC) hypothesis provides a theoretical framework to understand this relationship, suggesting that environmental degradation initially increases with economic growth but eventually declines as economies transition toward cleaner technologies and higher environmental awareness. This dynamic, however, remains contested, particularly in the context of emerging economies with diverse growth patterns and environmental policies.

Financial development plays a dual role in shaping environmental quality. On one hand, it facilitates access to capital for green investments and promotes energy-efficient technologies, potentially improving environmental outcomes. On the other hand, unchecked financial development can amplify energy consumption and industrial activities, contributing to environmental degradation. Thus, the net impact of financial development on environmental quality depends on the extent to which financial resources are directed toward sustainable practices.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Renewable energy consumption is widely regarded as a cornerstone of environmental sustainability. As emerging economies seek to reduce their dependence on fossil fuels, the adoption of renewable energy sources offers a pathway to mitigate greenhouse gas emissions and improve air quality. However, the transition to renewable energy faces challenges such as high initial costs, technological limitations, and institutional barriers, which can hinder its widespread adoption.

Foreign direct investment (FDI) serves as a critical source of capital and technology transfer for emerging economies, influencing their environmental outcomes in complex ways. While FDI can introduce advanced, environmentally friendly technologies and practices, it may also exacerbate environmental degradation if investors exploit lax environmental regulations in host countries—a phenomenon referred to as the "pollution haven hypothesis."

This study employs panel cointegration analysis to examine the long-run relationships among economic growth, financial development, renewable energy consumption, FDI, and environmental quality in emerging economies. This approach is particularly suited for understanding the dynamic interactions between these variables over time, accounting for cross-sectional and temporal dependencies. By focusing on emerging economies, the study contributes to the growing body of literature that explores sustainable development in regions characterized by rapid economic transformation and significant environmental challenges.

The findings of this study will have important implications for policymakers, particularly in designing strategies to balance economic growth with environmental sustainability. By identifying the drivers and inhibitors of environmental quality, this research aims to provide actionable insights for integrating economic, financial, and environmental policies in emerging economies.

The rest of the paper is Section 2, which contains literature on the relationship between economic growth, financial development, renewable energy, FDI, and environmental quality in emerging economies to develop hypotheses. Section 3 outlines the data, sample selection, variables, and methodology employed for testing the hypotheses. Section 4 presents the findings, including statistical analysis, correlations, and regression results, discussing how they support the hypotheses. Finally, Section 5 summarizes the key findings, discusses their implications, and offers suggestions for future research directions.

LITERATURE REVIEW

Liang and Yang (2019) explored the impact of China’s rapid economic and financial development on its natural resources and living standards. Their findings identified the existence of both short- and long-term Environmental Kuznets Curves (EKC) in China. They emphasized that financial productivity and financial interdependence ratios played crucial roles in reducing environmental degradation. In the long run, these financial metrics served as intermediaries, mitigating the adverse environmental effects of economic growth and contributing positively to sustainable development.

Fakoussa and Kabis-Kechrid (2020) examined the role of innovations in fostering economic and financial growth, focusing on Lebanon as a progressive country facing environmental challenges.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

The study demonstrated that economic expansion and financial development significantly increased carbon dioxide emissions. Control variables, including fossil energy consumption, trade openness, and urbanization, were found to amplify emissions. These findings underscore the importance of addressing energy and urbanization policies to balance growth with environmental preservation.

Ashraf, ur Rehman, and Chaudhry (2020) and Khan, Zafar, and Ayaz (2022) investigated the short- and long-term effects of per capita income, foreign direct investment (FDI), and oil prices on carbon dioxide emissions in Pakistan from 1971 to 2014. Using techniques such as Granger causality, ARDL, and non-ARDL cointegration, their results revealed that while rising oil prices increased emissions in the short term, they reduced emissions over the long term. However, both economic growth and FDI consistently contributed to higher emissions in the short and long run, highlighting the dual environmental challenges posed by economic and foreign investment growth.

Shah, Fianto, Sukmana, and Herianingrum (2022) utilized the Principal Components Analysis (PCA) to construct a financial sector indicator for Pakistan. Their analysis included variables such as stock market financing, liquid assets, domestic credit to the private sector, and credit provided by commercial banks, using data from 1972 to 2014. Employing econometric techniques like OLS, cointegration, and unit root testing, they found that all factors positively correlated with carbon dioxide emissions, indicating that financial development exacerbated environmental degradation, creating significant ecological concerns (Qin, Xu, Wang, & Skare, 2024).

Guo (2021) focused on the factors influencing carbon emissions in China, including the Financial Risk Index, renewable energy capacity, development funding, and human capital. Using advanced econometric techniques, such as the Popp and Narayan unit root tests with structural breaks, Maki cointegration, and frequency domain causality analysis, Guo examined time-series data from 1988 to 2018. The results indicated that increased renewable energy generation and enhanced human capital utilization significantly reduced carbon emissions, emphasizing the importance of sustainable energy policies and human resource development for environmental improvement.

Kalai, Becha, and Kamel (2024) used a simultaneous equation model to study the relationship between financial sector development, economic growth, and FDI on environmental degradation in Middle Eastern countries from 1980 to 2014. Their results showed a one-way causality from financial sector growth to increased CO2 emissions, suggesting that financial development in the region prioritized growth over environmental sustainability, necessitating more balanced policy frameworks.

Chandio et al. (2019) assessed the long-term impact of financial sector development on economic growth and environmental quality in Pakistan from 1980 to 2016. Employing unit root tests like ERS, KPSS, CMR, ZA, PP, and ADF, alongside cointegration methods such as ARDL, Johansen, and Engle-Granger, they found that extensive electricity and energy use in agriculture exacerbated environmental degradation. However, financial sector development

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

and foreign investments were associated with improvements in environmental quality, indicating the potential for sustainable economic growth through targeted policies (Khan & Arshad, 2024).

These studies collectively reveal the nuanced relationship between financial development, economic growth, and environmental sustainability. While financial and economic growth often exacerbate environmental degradation, targeted interventions—such as promoting renewable energy, enhancing financial productivity, and adopting innovative technologies—can mitigate adverse effects and support sustainable development. These findings provide a robust foundation for future research and policy-making aimed at balancing growth with environmental preservation.

Based on the title of the study, here are potential hypotheses that could align with the research focus on the impact of economic growth, financial development, renewable energy consumption, and foreign direct investment (FDI) on environmental quality in emerging economies, using panel cointegration analysis:

H_1: Economic growth greatly affects environmental quality in emerging economies.
H_2: Financial development enhances environmental quality in emerging economies.
H_3: Increased renewable energy consumption improves environmental quality in emerging economies.
H_4: FDI positively affects environmental quality in emerging economies.
These hypotheses would guide the empirical analysis, with panel Cointegration analysis helping to test the long-run relationships between these variables.

Conceptual Frameworks

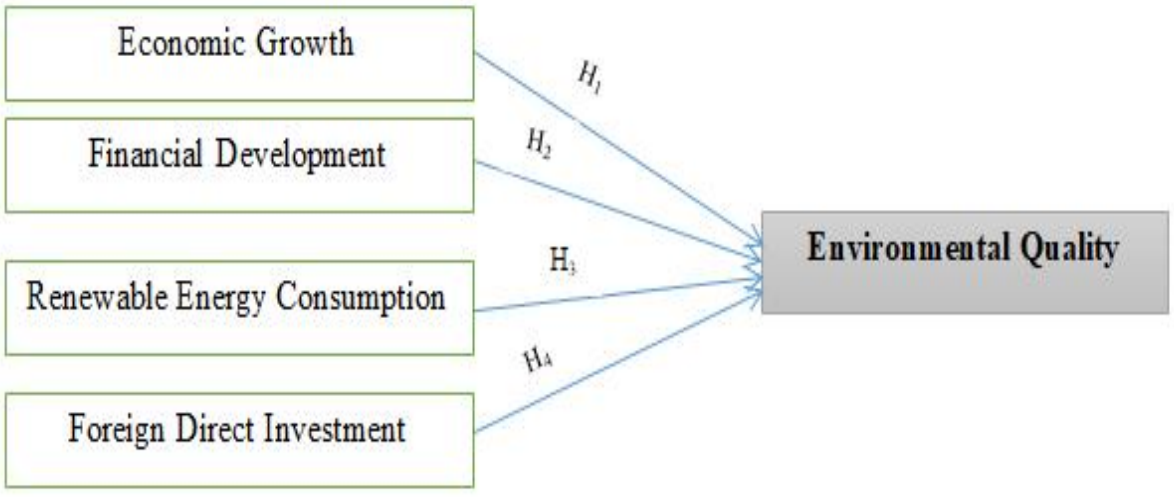

Figure 1: Conceptual Framework

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

METHODOLOGY

This study examines the links between financial development, economic growth, FDI, renewable energy use, and environmental quality in 70 developing economies (2022–2023) using World Bank data. Countries were selected based on IMF and UNDP classifications for diverse representation.

Variable Description and Measurements

Ser	Variable	Type	Proxy	Abbreviation	Measurement
1	Financial development.	IV	Broad Money	BMNY	The %age of Broad Money to GDP.
2	Economic Growth	IV	Gross Domestic Product	GDP	Current GDP in US dollars
3	Foreign Direct Investment	IV	FDI inflows	DINV	Net inflows of FDI as a % age of GDP.
4	Renewable Energy Consumption	IV	RNEW	RNEW	% age the Final Total Consumption of Energy
5	Environmental quality	DV	CO2 Emissions	CO_2 KT	Total CO2 emissions in kilotons

Model Specification

Regression model is specified as follows:-

Linear Model

$CO2_{KT} = \beta_0 + \beta_1 BMNY + \beta_2 GDP + \beta_3 DINV + \beta_4 RNEW + \varepsilon$

Log-Log Model

$\log(CO2KT) = \beta 0 + \beta 1 \log(BMNY) + \beta 2 \log(GDP) + \beta 3 \log(DINV) + \beta 4 \log(RNEW) + \varepsilon$

$Co_2 = f(BMNY + GDP + DINV + RNEW)$

$CO2_{KT} = \log BMNY + \log GDP + \log DINV + \log RNEW$

Where,

$CO2_{KT}$: Proxy for environmental quality, measured as carbon dioxide emissions in kilotons.

BMNY: Broad money, a proxy for financial development, reflecting liquidity in the economy.

GDP: Gross Domestic Product, representing economic growth and overall economic output.

DINV: Direct Foreign Investment, capturing the inflow of foreign capital into the economy.

RNEW: Renewable energy consumption, measuring the use of renewable energy sources within the energy mix.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

ε: The error term, accounting for unobserved variables or random disturbances.
This methodological approach ensures a comprehensive analysis of how financial and economic factors interact to influence environmental outcomes in developing economies.

RESULTS AND DISCUSSIONS

This study employed regression analysis to evaluate the relationship between the Development Financial Sector, Economic Growth/Expansion, and Environmental Quality. Multiple regression models were used to estimate environmental quality enforcement based on financial development and economic growth, while adjusting for other factors that may influence environmental quality.

DESCRIPTIVE ANALYSIS

It provides valuable insights into the characteristics of the variables in your study, highlighting issues such as Skewness, kurtosis, and the presence of outliers. Here's a breakdown of the key takeaways and considerations:

Table 1: Descriptive Statistics of Variables

Particulars	CO2_KT	Broad Money	GDP	Domestic Investment	Renewable Energy
Mean	2134	54	2.67	3.99	38.91
Median	1305	43.54	3.5	2.657	33.46
Maximum	1111	265.9	1.77	103.3	95.35
Minimum	240	5.21	4.87	6.62	0.01
Standard Deviation	1016	39.79	1.12	5.908	29.73
Skewness	8.403	2.235	10.14	8.541	0.33
Kurtosis	77.85	9.747	121.7	112.9	1.749
Jarque-Bera	3722	4143	9178	7831	126.5
Probability	0	0	0	0	0

The descriptive analysis reveals significant variability and non-normal distributions across variables. CO2 emissions show high Skewness and kurtosis, indicating a few extreme values, suggesting log-transformation or Winsorization to manage outliers. Similarly, broad money, GDP, and domestic investment display Skewness and variability influenced by outliers, requiring adjustments like transformations or robust methods. In contrast, renewable energy consumption has a more balanced distribution. The Jarque-Bera test rejects normality for all variables, supporting the use of non-parametric methods like quintile regression. Addressing outliers and standardizing variables can improve model stability and comparability.

Table 2: Correlation Analysis

	CO_2_KT	BMNY	G.D.P	DINV	RNEW
$CO2_{KT}$	1				
BMNY	0.397	1			
GDP	0.920	0.372	1		

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

DINV	-0.052	0.015	-0.06	1	
RNEW	-0.15	-0.451	-0.146	0.088	1

The correlation matrix reveals significant relationships between the variables, highlighting economic and environmental dynamics. CO2 emissions (CO2_KT) exhibit a strong positive correlation with GDP (0.920), indicating that higher economic output is closely associated with increased emissions, likely reflecting energy-intensive industrial and economic activities. Broad Money (BMNY) shows moderate positive correlations with both CO2 emissions (0.397) and GDP (0.372), suggesting that greater financial activity aligns with economic growth and associated emissions. Conversely, Domestic Investment (DINV) **and** Renewable Energy Consumption (RNEW) display weak to negative relationships with most variables. Notably, RNEW is negatively correlated with CO2 emissions (-0.150) and BMNY (-0.451), indicating that higher adoption of renewable energy corresponds with lower emissions and a reduced money supply. These correlations suggest that while economic expansion drives emissions, renewable energy adoption can mitigate environmental impacts, presenting a contrasting relationship in the data.

Table 3: Cointegration Test Results

Statistic	Unweighted	Prob.	Weighted	Prob.
Panel v-Statistic	4.698	0	-0.624	0.733
Panel rho-Statistic	2.0688	0.98	3.771	0.999
Panel PP-Statistic	-1.769	0.038	-1.1839	0.118
Panel ADF-Statistic	-2.363	0.009	-0.598	0.027

Table 4:Alternative Hypothesis: Individual AR Coefficients (Between-Dimension)

Statistic	**Value**	**Prob.**
Group rho-Statistic	6.677	1
Group PP-Statistic	-3.6378	0
Group ADF-Statistic	-1.288	0.098

The panel cointegration test results indicate mixed evidence regarding the presence of long-term relationships between the variables. Some test statistics strongly support cointegration, such as the v-Statistic (p = 0.0000) and the Panel ADF-Statistic (p = 0.0090), suggesting a robust long-term linkage among the variables. However, other test results, such as the Panel PP-Statistic (p = 0.1182), are not significant, indicating a lack of consistent support for cointegration across all metrics. Similarly, in the group statistics, the Group PP-Statistic (p = 0.0001) points to significant cointegration, but the Group ADF-Statistic (p = 0.0988) shows only marginal significance, indicating weaker evidence. These discrepancies suggest that while there is some evidence of a long-term relationship among the variables, the results are not uniformly strong

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

across all tests. This calls for caution in interpreting the findings, as the strength of Cointegration may depend on the specific test used and the underlying assumptions.

Table 5: Panel ARDL Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			
Broad Money	0.3210	0.020	15.89	0.0000
GDP	0.364	0.010	33.75	0.0000
Domestic investment	0.054	0.007	6.929	0.0000
Renewable energy	-0.438	0.037	-11.55	0.0000
	Short Run Equation			
Broad money	-0.1128	0.019	-5.697	0.000
	0.0654	0.020	3.206	0.001
GDP	0.0051	0.022	0.229	0.818
Domestic investment	0.0050	0.003	1.659	0.097
Renewable energy	-1.100	0.203	-5.406	0.000
C	0.125	0.035	3.560	0.000
Mean dep var	0.037	S.D. dependent var		0.081
S.E. of reg	0.049	Akaike info criterion		-3.14
Sum sq resid	2.742	Schwarz criterion		-1.677
Log-likelihood	2804	Hannan-Quinn criter.		-2.598

The findings highlight a negative relationship between financial development and environmental quality, where an increase in the Broad-Money-to-GDP ratio is associated with higher CO2 emissions, indicating that financial expansion may exacerbate environmental degradation without proper controls. Similarly, economic growth negatively impacts environmental quality, as higher real GDP growth rates correlate with increased CO2 emissions, further deteriorating environmental conditions. The study also identifies foreign direct investment (FDI) as a contributing factor to environmental decline, emphasizing the need for stricter regulatory oversight.

The research underscores that these negative impacts can be mitigated through robust laws, stringent environmental policies, and effective implementation plans. Renewable energy consumption stands out as a sustainable alternative, showing potential for simultaneously improving environmental quality and supporting economic development. Therefore, adopting renewable energy solutions can serve as a viable strategy for achieving economic growth while maintaining environmental integrity.

In conclusion, the study suggests that policymakers should enforce stricter environmental regulations, such as higher standards for emissions and waste management, while incentivizing eco-friendly practices. For instance, the European Union's cap-and-trade system and its ambitious 2030 carbon reduction targets serve as practical examples of balancing economic and environmental priorities. These measures can guide selected economies in integrating financial development and economic growth with environmental sustainability.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

FINDINGS, IMPLICATIONS, AND FUTURE RESEARCH DIRECTIONS

This section consolidates the study's key findings, explores their practical and theoretical implications, and provides recommendations for future research.

SUMMARY (FINDINGS)

Financial Development and Environmental Quality**:** The study reveals a negative relationship between financial development (as proxied by the Broad-Money-to-GDP ratio) and environmental quality, highlighting that increased financial activity contributes to higher CO2 emissions, worsening environmental conditions.

Economic Growth**:** Economic expansion, reflected in real GDP growth, is linked to a rise in CO2 emissions, indicating that traditional growth trajectories can have adverse environmental consequences unless mitigated by sustainable practices.

Foreign Direct Investment (FDI)**: FDI** negatively impacts environmental quality, suggesting that without regulatory controls, foreign investments may prioritize economic returns over environmental considerations.

Renewable Energy Consumption**:** Renewable energy emerges as a key variable with a positive impact on environmental quality, offering a pathway to mitigate CO2 emissions while supporting economic development.

IMPLICATIONS

Policy-Implications**:** The findings call for stricter environmental regulations, including higher standards for emissions and waste management. Incentives for adopting renewable energy and eco-friendly practices should be coupled with penalties for non-compliance. Examples like the EU's cap-and-trade system demonstrate actionable strategies for achieving sustainability goals.

Practical Implications**:** Businesses and investors must align their operations with sustainable development goals by incorporating renewable energy and environmentally conscious practices into their strategies.

Theoretical Implications**:** The study contributes to the literature by reinforcing the dual impact of economic and financial activities on environmental quality, highlighting renewable energy's role as a mitigating factor.

DIRECTIONS FOR RESEARCHERS

Investigate how governance quality, environmental regulations, or technological advancements mediate the relationship between financial development and environmental quality.

Examine specific industries or sectors to identify variations in the impact of financial development and economic growth on environmental outcomes.

Expand the scope to include diverse geographical regions to explore differences in the financial-environment nexus across developed, developing, and emerging economies.

Evaluate the long-term effectiveness of environmental policies, such as renewable energy subsidies or carbon pricing mechanisms, on mitigating CO2 emissions.

Assess the role of AI-driven innovations in balancing economic growth with environmental sustainability, particularly in renewable energy optimization and pollution control.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

REFERENCES

Ashraf, M. W., ur Rehman, H., & Chaudhry, I. S. (2020). The Impact of Economic Growth, Foreign Direct Investment, Urbanization, Fossils Fuel Consumption on Environmental Degradation in Emerging Asian Economies. *Journal of Business and Social Review in Emerging Economies, 6*(4), 1479-1495.

Chandio, A. A., Jiang, Y., Rauf, A., Mirani, A. A., Shar, R. U., Ahmad, F., & Shehzad, K. (2019). Does energy-growth and environment quality matter for agriculture sector in Pakistan or not? An application of cointegration approach. *Energies, 12*(10), 1879.

Fakoussa, D., & Kabis-Kechrid, L. L. (2020). Jordan's Socio-Economic Woes and Foreign Policy: Employment, Trade, and International Cooperation-Policy Briefs from the Region and Europe.

Guo, Y. (2021). [Retracted] Financial Development and Carbon Emissions: Analyzing the Role of Financial Risk, Renewable Energy Electricity, and Human Capital for China. *Discrete Dynamics in Nature and Society, 2021*(1), 1025669.

Kalai, M., Becha, H., & Kamel, H. (2024). Exploring the Nexus Link of Foreign Direct Investment Inflows and Openness on Economic Growth: Evidence from BRICS Economies. *Journal of East-West Business*, 1-37.

Khan, Y., & Arshad, M. W. (2024). Investigating How Customers Act and Formulate Opinions About Homemade Green Products in the Context of an Emerging Economy. *Journal of Business and Management Research, 3*(1), 731-742.

Khan, Y., Zafar, S., & Ayaz, M. B. (2022). The Effect of Firm Size, Investment Opportunity Set, and Capital Structure on Firm Value. *International Journal of Social Science & Entrepreneurship, 2*(2), 32-46.

Liang, W., & Yang, M. (2019). Urbanization, economic growth and environmental pollution: Evidence from China. *Sustainable Computing: Informatics and Systems, 21*, 1-9.

Qin, Y., Xu, Z., Wang, X., & Skare, M. (2024). Artificial intelligence and economic development: An evolutionary investigation and systematic review. *Journal of the Knowledge Economy, 15*(1), 1736-1770.

Shah, S. A. A., Fianto, B. A., Sukmana, R., & Herianingrum, S. (2022). Credit risk management resource efficiency in the implementation on Basel Accord: a study of Pakistani banking sector. *International Journal of Monetary Economics and Finance, 15*(6), 567-584.

Solaymani, S., & Montes, O. (2024). The role of financial development and good governance in economic growth and environmental sustainability. *Energy Nexus, 13*, 100268.

Wei, X., Mohsin, M., & Zhang, Q. (2022). Role of foreign direct investment and economic growth in renewable energy development. *Renewable Energy, 192*, 828-837.