GREEN ECONOMY AND RENEWABLE ENERGY TRANSITIONS

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ABSTRACT

The study investigates the transition process and core principles of a green economy. At a global level, green growth represents the essence of a green economy. In this context, the process of restructuring the market economy and transitioning toward a green economy implies continuous efforts and interdependence since it cannot be achieved in isolation. The model of restructuring economic activities to the specificity of a green economy addresses the interdependent pillars of sustainable development: environmental concerns; renewable energy; low carbon levels. Nevertheless, the green economy model that is applied to advanced economies cannot be implemented to low-income economies because of development gaps. Moreover, emerging economies also have other goals and priorities that demand changes into the green economy model of advanced economies. Further study suggests that the boosting effect from implementing renewable energy policy may be overshadowed by its effects on resource allocation efficiency and technological innovation. In addition, differences in firms' type, external environment, and geographical location make the impact of renewable energy policies on total factor productivity heterogeneous. For example, renewable energy policies tend to suppress the total factor productivity of state-owned firms, large-scale firms, and firms with high equity concentration. The transition to a green economy for any country is crucial for the sustainability development of the economy, environment, society, and governance. A green economy is a sustainable approach to combating climate change and promoting sustainable development through the adoption of sustainable energy.

Keywords: green economy; sustainable development; low carbon; renewable energy; restructuring model

INTRODUCTION

Environment-friendly innovation and using renewable energy sources are essential for improving the quality of the environment. Consequently, renewable energy resources appear critical in resolving energy security and environmental degradation issues. Renewable energy contributes significantly to the energy supply and has the potential to improve the current energy mix, address market distortions, and diminish environmental degradation. The concept and principles of a green economy have emerged as a sensible long-term solution. With respect to the process of restructuring the market economy, shifting to a green economy is the most difficult step. This is mainly related to imposing restrictions on the use of natural resources, regulating energy production and changing consumption habits. In this context, investments in green projects are essential for the efficient preservation and judicious use of world resources. This study tackles the subject of green economy and the related principles that promote green investments. That indicates that intensifying renewable energy sources has become a critical component of the global shift to a low-carbon society. Moving fossil fuel to renewable energy sources can close the present and future energy gap, opening the route for decarburization, energy security, and improving economic growth. However, different studies concluded different findings and the insignificant association between the renewable energy-

environment nexus. A significant and inverse association was found between the environment and renewable energy. Globally, trade continued to expand and develop internationally, and many countries heavily depend on international trade. Recently, it has been considered an integral part of the globe. Technological change can improve environmental quality, as advanced cleaner technologies to control pollution are imported from other countries and exported to other economies. Using these sources in order to obtain energy are not affecting the environment, as well as contribute significantly to achieving sustainable development, as it contributes to the acceleration of production, stability and growth, creating new job opportunities and working to improve living standards and reduce poverty. In this discourse the Green Economy is defined as an economic system that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities… In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem service Conserving biodiversity and maintaining ecosystem services are key pillars of the efforts to transition to a Green Economy

LITERATURE REVIEW

Tomiwa Sunday Adebayo (2023) This study focuses on uncovering the effect of country risks and renewable energy consumption on environmental quality. In this context, the study examines Mexico, Indonesia, Nigeria, and Turkey (MINT) nations; takes economic growth, trade openness, and urbanization into account; includes data from 1990 to 2018; applies cross-sectional autoregressive distributed lag (CS-ARDL) as the main model while common correlated effects mean group (CCEMG) and augmented mean group (AMG) for robustness checks. Based on these results, policymakers should promote a sustainable environment to lessen the ecological footprint.

Munir Ahmad (2022) Since climate change is the paramount concern of recent literature, macroeconomic factors such as green growth and economic globalization may play an integral role in achieving ecological sustainability in the presence of eco-innovation. However, the combined contributions of green growth, economic globalization, and eco-innovation towards achieving ecological sustainability are missing from the existing knowledge. Therefore, we investigate the combined influence of these variables in the presence of human capital, financial development, and gross domestic product on ecological footprint per capita for a panel of 20 Organization for Economic Co-operation and Development (OECD) countries from 1990 through 2017. The method of panel quantile regression is used to produce sound results across varying levels of the ecological footprint of OECD nations. Secondly, economic globalization manifests mixed effects: it induces ecological deterioration impact in the absence of its interaction with eco-innovation, while it brings about an ecological protection impact with the interaction term.

Lin-Na Hao (2021) This study analyses the role of green growth in promoting a sustainable environment. In literature, the empirical and theoretical examination on the role of green growth in carbon dioxide (CO_2) emissions is missing, especially in combination with other factors, i.e., human capital index, environment-related taxes and development of environment-related technologies. This study investigates the role of environmentally adjusted multifactor productivity growth (i.e. green growth) on CO_2 emissions for G7 countries from 1991 to 2017. The study utilizes second generation panel data method(s), i.e. Cross-Sectionally Augmented Auto-regressive Distributive lag (CS-ARDL) model. The outcomes of theoretical and empirical findings indicate that both linear and non-linear term for green growth reduces CO_2 emissions. Also, environmental tax, human capital and renewable energy use are found to decrease CO_2 emissions.

Massimiliano Mazzanti (2020) Over the recent years, there has been evidence of a decline in energy intensity worldwide. Most of this decline was industry or sector specific. The main aim of the quantitative analysis is to enhance the understanding of how green energy innovative activities are entangled with energy intensity in the OECD through models that take into account heterogeneity and

serial correlation. The existing literature does not fully address this country related heterogeneity in either the short- or long-run scales. We use some specific estimators that address those key econometric issues. The analysis specifically focuses on the dynamics of green energy innovation and finds the existence of both short-term and long-term relationships between energy intensity and green energy innovative activities, though this relationship loses its significance over time.

Andrew Adewale Alola (2020) This study is primarily motivated by exploring the role of globalization, energy intensity over economic expansion, and its impact on environmental sustainability in China. To this end, a sequence of econometrics tests were conducted to address this hypothesized relationship. The choice of China is informed by intense industrial activities and being one of the leading world economies. Annual frequency data from 1971 to 2015 is utilized for the current study. Empirical finding from novel and robust Bayer and Hanck combined cointegration test supports cointegration equilibrium relationship among the variables under review. This indicates a convergence between the explanatory variable and the explained variable in the fitted model. Further empirical evidence shows a positive statistically significant relationship between real income, ecological footprint, and globalization index.

Green Economy

As an economic parameter, GDP is limited to measuring a monetary value of final economic products. Because, nations need broader indicators that are compatible with the pillars of sustainable As an economic parameter, GDP is limited to measuring a monetary value of final economic products. Because, nations need broader indicators that are compatible with the pillars of sustainable To settle this problem, United Nations and the World Bank raised the concept of Green GDP and Green economy. UNEP defined green economy as the economy that results in 'improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities". It is low-carbon, resource efficient and socially inclusive approach. In green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency and prevent the loss of biodiversity and ecosystem services. Nowadays, the idea that though a trade-off relationship between economic progress and environment al conservation has become less credible.

Green Growth, Green Economy and Sustainable Development

Green growth is defined by the OECD as "Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" Similarly, defines green growth as a "making growth processes resource-efficient, cleaner and more resilient without necessarily slowing them". However, there are some driving factors of green growth. Listed these factors as the prevention of growth-damaging development, state-induced investments, innovation, the dynamics of future green markets, and resource productivity. Green growth is not a replacing philosophy for the notion of sustainable development. Rather it should be considered as a subset that helps to achieve a targeted economic progress alongside the environment. Since last few decades, the goal of sustainable development has become a major policy objective. However, the sustainable development policy goal is not yet seen in line with the traditional economic and policy objectives. he notion of sustainable development will be sharpen through considering various stocks of nations at a given period.

Renewable Energy and Sustainable Development Nexus

Energy use has been strongly correlated with different level of economic activities in a variety of relationships that populate the currently growing energy-growth environment causality literature. This is because of the industrial nature of the current civilization that started in the 18th century Europe and spread throughout the world in a system that is characterized with intensive energy powered machine use for all production aspects of life. While these machines can continuously produce higher output within limited timespan than manual labour, they consume humongous amount of energy.

Hence the quest for more energy, whenever there is need to produce higher output, is launched, leading to utilization of different kinds of energy; namely renewable (non-fossil fuels) and non-renewable (fossil fuels) energy. Early on, fossil fuels proved easier and cheaper to use, as such more and more of it was used for almost a century now until the risks and negative signs that have the capability of collapsing the global environmental system began to surface.

Renewable energy transition and the employment impact

The employment impact of renewable energy sources has largely been found to have a net positive effect analyze the employment impact of renewable technologies and model-based scenario assessments from specific renewable policies. They find an overall positive net employment effect, although the results crucially depend on the financing of the renewable energy source support scheme and the global competitiveness of a specific technology. Several studies also find a positive net employment effect because of new investments in the supply-chains of renewable energy system. Report a large effect on job creation in the construction and installation phase of renewable energy sources, which can possibly drop in the later phase. Find positive effects on labor market with an increased amount of investment in the renewable energy sector. However, the technology effect may lower the employment opportunities.

Methods for estimating employment impact of renewable energy

An additional challenge in collecting data on green jobs is on how to define and measure them. Suggest finding universally applicable measures of green employment such as: employment in new technologies, business practices, or shifts in employment where it is hard to identify differences between efficiency improvements from regular employment; employment in environment-related technologies or 'green tech'; and employment in newly emerging sectors of the economy such as renewable energy production etc. The literature on the methodologies estimating the employment generation in the renewable energy literature can be broadly classified into three broad For an in-depth discussion on the methods. These three methods differ in terms of the induced effects in their estimation, for example, I-O methods are limited to accounting for investment decreases in traditional energy sources and household income Although the CGE models can introduce multiple induced effects they are computation and data intensive, requiring data for all sectors of the economy that may not be available

RESEARCH METHODOLOGY

A qualitative study of the term Green Economy, its nature and the impacts of implementing Green Economy on the Trade and Employment sector. This paper also studies the role and effectiveness of the concept of Green Economy in the achievement of Sustainable Development. The purpose of this research was to gain an in-depth understanding of the concept of Green Economy. For example, understanding the meaning and etymology of the term, studying the impacts of adopting a green economy and its role in the achievement of Sustainable Development. The experimental study on the Iraq as an example of a developing country. It studies the impact of the green economy through renewable energies in countries to reach sustainable development, and this is through the pilot studies of some countries transition their economy to the green economy to achieve the goal of sustainable development. The study will also rely on the local reports of the authority for the development and use of new and renewable energy, as well as the reports of the Ministry of Electricity and Renewable Energy. Finally, the study will rely on the method of personal interviews to obtain information related to the practical aspect of the study, which is to analyze the cost and revenue of the use of renewable energies compared to fossil energy.

RESULTS AND DISCUSSIONS

The top ten nations from Table 1 (leading world economies and emerging markets) were selected to define the restructuring model of a green economy. As can be seen from the table, the mean average of the depletion of natural resources was 0.91% of the Gross National Income (GNI), higher than the

values of USA, Japan, Germany, France, Spain, the UK and Italy. The only countries exceeding the mean value were members of the BRICS group (Brazil, China and India), which seems reasonable since these economies were heavily geared toward intensive production during the analyzed period.

Table 1. Global LCEGS values for the top 10 countries in terms of CO2 emissions, renewable energy consumption and depletion of natural resources

Country	Carbon Sales (Million GBP)	% of Total	GDP (%)	CO2 Emissions per Capita Tones 2013	Annual Change % (1990–2013)	Renewable Energy Consumption (% of Total Final Energy Consumption)	Natural Resource Depletion (% of GNI 2010–2014)
USA	660,760	19.2	1	16.4	−0.7	7.9	0.7
China	444,324	12.9	9.5	7.6	5.6	18.4	2.3
Japan	213,295	6.2	−0.1	9.8	0.4	4.5	0.0
India	210,815	6.1	5.2	39	1.6	3.6	2.9
Germany	145,267	4.2	3.7	12.4	9.2	-	0.0
UK	128,141	3.7	1.5	7.1	−1.3	4.4	0.6
France	104,201	3.0	2.1	5.1	−1.0	12.6	0.0
Brazil	103,583	3.0	4	2.5	2.5	43.6	2.5
Spain	92,136	2.7	5	5.1	−0.4	15.7	0.0
Italy	89,485	2.6	0.6	5.7	−1.1	10.9	0.1
Mean	219,200.7	6.36	3.27	11.07	2.38	13.511	0.91
SD	468.188	2.316	1.507	3.173	1.175	3.538	−0.949
Variance	219,199.7	5.36	2.27	10.07	1.38	12.511	−0.09

Data from Eastern European economies are shown in Table 2. With respect to the Eastern European countries included in the sample, the mean average of depletion of natural resources was 0.525% of the Gross National Income (GNI). The value was surpassed only by Romania and Poland during the analyzed period.

Table 2. Global LCEGS values for four economies in the upper income group from Eastern Europe in terms of CO2 emissions, renewable energy consumption and depletion of natural resources.

Country	Sales (Million GBP)	%of Total	GDP (%)	CO2 Emissions per Capita Tones 2013	Annual Change % (1990-2013)	Renewable Energy Consumption (% of Total Final Energy Consumption)	Natural Resource Depletion (% of GNI 2010–2014)
Romania	11,955	0.3	1.1	3.5	−2.7	21.7	1.0
Poland	29,526	0.9	5	7.9	−0.8	11.1	0.7
Czech Republic	11,444	0.3	1.8	9.4	_	10.9	0.1
Hungary	10,081	0.3	1.7	4.2	−2	10.2	0.3

Mean	15,751.5	0.45	2.4	6.25	1.3	13.475	0.525
SD	125.5	−0.742	1.183	2.291	0.548	3.532	−0.689
Variance	15,750.5	−0.55	1.4	5.25	0.3	12.475	−0.475

Table 3 contains data from ten countries, the vast majority being from Africa. In this case, the mean average of natural resource depletion was 14.83% of the Gross National Income (GNI). In comparison with the previously analyzed countries, these economies registered the highest levels of natural resource depletion. The outcome can be explained by the fact that these low-income countries count on the exploitation of their natural resources in order to generate income that is fully dependent on agriculture. Moreover, the depletion of such resources occurs at a faster pace than in other countries because of the gap in terms of infrastructure, electricity facilities and technological advancement.

Table 3. Low-income countries in terms of CO2 emissions, renewable energy consumption and depletion of natural resources.

CO Emissions Annual Change % per Capita Tons 2013 (1990 2013)			Renewable Energy Consumption (% of Total Final Energy Consumption)	Natural Resource Depletion HDI (% of GNI 2010–2014)	
Burundi	0.0	−2.7	96.6	13.8	184
Congo	0.0	−4.7	96	31.8	176
Somalia	0.1	14.1	94.2	8.6	-
Ethiopia	0.1	2.6	93.5	11.2	174
Chad	0.0	2.8	90.6	13	186
Uganda	0.1	5.0	90.3	11.5	163
Bhutan	1.2	7.1	90.0	16.9	132
Liberia	0.2	−0.1	89.4	27.4	177
Guinea-Bissau	0.1	−0.5	88.6	12.3	183
Mozambique	0.2	3.0	88.4	1.8	181
Mean	0.2	4.26	91.76	14.83	172.88
SD	−0.894	1.806	9.527	3.719	13.111
Variance	−0.8	3.26	90.79	13.83	171.889

CONCLUSIONS

Green economic growth is promoted through green energy as dependency on non-renewable energy sources can significantly deteriorate the quality of the environment. Still, environmental sustainability can be achieved through renewable energy sources. Moreover, natural resources can deteriorate less through the production of green products and renewable sources. These findings supported the theory of Core-macroeconomics. This analysis concluded that environmental quality is significantly improved by green technological innovation and growth, as the bi-directional association between green growth and green technologies indicates that both promote a green and clean environment. In spite of the promises made by the advocates of the Green Economy, this thesis has proven that this strategy is not free from environmental degradation and further limitations. It could be that through an improved monitoring of the Green Economy, that is to say, accounting for all possible negative externalities driven by the implementation of the strategy, nature does not suffer from environmental harm on a global scale. The dependency of the Green Economy on an external sphere can be

explained at different levels. First, the Green Economy is highly dependent on raw materials that are being currently extracted in countries that suffer from the correspondent environmental problems.

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