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Green Economic Growth: A Global Analysis of Fiscal Expenditures, Institutional Quality, and Stock Markets

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Abstract: Green economic growth is the main focus in achieving sustainable development throughout the world. This study aims to conduct a global analysis of fiscal spending, institutional quality, and stock markets in relation to green economic growth. Through a holistic approach, this research explores the complex relationship between these three factors and their impact on sustainable economic growth. By considering various relevant variables and indicators, this study provides an in-depth understanding of the factors influencing the transition to a green economy. Well-directed fiscal spending can encourage investment in green technologies and green infrastructure, while good institutional quality ensures effective and fair policy implementation. Additionally, the stock market plays an important role in providing capital to companies focused on green innovation. It is hoped that the results of this analysis will provide valuable insights for policy makers, economic practitioners and other stakeholders in designing sustainable and environmentally friendly economic development strategies. The findings of this study show that synergy between prudent fiscal policy, strong institutions, and dynamic stock markets is critical to driving green economic growth. Thus, this study has the potential to make a significant contribution to advancing the sustainable development agenda at the global level. The resulting conclusions can form the basis for strategic decision-making that supports the transition to a green economy, as well as help direct investment and public policy in a more sustainable direction.

Keywords: Green Economic Growth Development, Fiscal Expenditures, Institutional Quality, Stock Market

Introduction

In an era where environmental conservation is increasingly recognized, the concept of a green economy is becoming increasingly important in efforts to achieve sustainable economic growth. A green economy does not only emphasize economic aspects, but also pays attention to the impact of economic activities on society and the environment (Fang, 2024; Z. Zhang, 2024). The green economy aims to create a more efficient, fair and environmentally friendly economic system by embedding sustainability principles in all aspects of economic activities (Akai, 2024; Cheng, 2024). Green economy is a concept that is increasingly developing to create sustainable and environmentally friendly economic growth. One of the focuses of a green economy is the sustainable use of resources. This includes the use of renewable energy, efficient waste management and the use of environmentally friendly technologies to reduce the carbon footprint. By reducing dependence on limited natural resources and adopting more environmentally friendly

production practices, a green economy has the potential to reduce negative impacts on the environment and generate more inclusive economic growth. The green economy also encourages innovation and investment in sustainable sectors such as renewable energy, mass transportation, organic farming and environmentally friendly technology. By providing incentives for companies and individuals to shift to more sustainable business practices, the green economy can be a driver of change towards a more climate-resilient and sustainable society (Xi, 2023; Yan, 2023).

Fiscal expenditure refers to government expenditure to finance various public programs and activities (Tran, 2024; L. Wei, 2023). Tax expenditure covers various aspects, including government spending on infrastructure, public services such as education and health, payment of civil servant salaries, subsidies and other social programs. The main objective of government spending is to meet people's needs, improve the quality of life, and encourage economic growth. Tax expenditures can be an important instrument in a country's economic policy (Deng, 2023; C. Xu, 2023). Through appropriate and efficient spending, the government can influence economic growth, fiscal stability and income distribution. Prudent government spending can also be used to respond to changes in economic conditions, such as recession and inflation, to create jobs, and to increase people's purchasing power. However, uncontrolled or inefficient government spending can also have negative impacts on the economy, such as large budget deficits, uncontrolled inflation, and unequal distribution of wealth. Therefore, proper and transparent management of government spending is very important to maintain the country's fiscal stability and long-term economic sustainability (J. Chen, 2023; Tan, 2023).

Institutional quality is the condition and quality of institutions in a government system which includes sustainability of public policies, transparency, accountability, efficiency and strong law enforcement (Hou, 2023; Yuan, 2023). High institutional quality is very important in creating a conducive business environment, encouraging sustainable economic growth, and increasing investor confidence. Good institutions can also provide protection for individual rights, encourage innovation, and strengthen social stability. Good institutional quality is an important foundation in building a just, efficient and sustainable society. Efforts to improve institutional quality require commitment from different stakeholders, such as the government, private sector, and civil society, to ensure that existing institutions can function well and provide maximum benefits for the entire community (Jacques, 2023; S. Zhang, 2023).

The stock market is a marketplace for trading stock and securities of publicly listed companies. In the stock market, investors can buy shares to acquire shares in a company and participate in its growth (S. Chen, 2023; S. Wei, 2023). Apart from that, the stock market also reflects a country's economic conditions, investor sentiment, and expectations regarding the performance of certain companies or economic sectors (Peng, 2023; X. Xu, 2023). The stock market has an important role in the economy because it can be a source of funds for companies for business expansion and development. In addition, stock market trends can be an indicator of the health of a country's economy and can influence investment decisions and other economic decisions. Through the stock market, investors have the

opportunity to invest in various financial instruments and benefit from increasing the value of their assets.

Research Method

This research applies a meta-analysis approach to synthesize findings from five international journals relevant to the keyword "green economics". The literature search process was carried out thoroughly through leading academic databases such as Science Direct, Emerald, and Taylorandfrancis, with an emphasis on publications covering aspects of the green economy. Journal selection is carried out based on strict inclusion criteria, considering the quality of research methodology, relevance to the research topic, and suitability to the research objectives. Once appropriate journals were identified, the researcher systematically extracted data from each article, including research objectives, conceptual framework, research methods, population sample, variables studied, main findings, and implications of the research results.

Data from the five journals was then analyzed qualitatively using a descriptive approach, highlighting patterns, themes and relationships that emerged from the literature. This analysis takes into account variations in methodological approaches, measurement of variables, and the context in which the studies were conducted. By integrating findings from each journal, researchers can identify general trends, patterns of similarity, as well as variability in the research results observed. Next, the researcher carried out a comparative analysis to highlight the similarities and differences between the findings from each journal, as well as explore the implications of these differences.

Based on this qualitative analysis, researchers draw conclusions about the relationship between the variables studied, namely fiscal spending, institutional quality, and the stock market, with green economic expansion. Additionally, this research sheds light on other factors that could affect the dynamics of green economic growth, such as government policy, green technology, and market responses to environmental sustainability. Based on these findings, researchers developed comprehensive policy recommendations to support sustainable green economic growth, considering the intricate interactions among the involved factors. Thus, the meta-analysis method in this context provides a deeper and more comprehensive understanding of the factors influencing green economic growth, as well as its policy implications.

Result and Discussion

Results

Cross-sectional data analysis found that spending on education, research and development has a direct correlation with economic growth. This means that the expansion of the green economy is driven by rises in both types of fiscal spending. According to the coefficient estimates, green growth rises by 1.010% and 1.610%, respectively, for each 1% increase in spending on exploration and development and education (Xuan Huang, 2022).

The estimation results suggest the existence of both a method effect and structural

effect, demonstrating the beneficial relationship between government spending on education and R&D and green growth. Fiscal expenditures on public goods, like wastewater and SO2 emissions, can be increased to greatly reduce carbon emissions. More specifically, the estimated R&D expenditure coefficient is higher than the estimated education expenditure coefficient, indicating a higher technical impact.

The FMOLS method, which accounts for differences and biases, is employed to compute long-term projections of how institutional quality affects green growth attributes. Benin's outcomes may be attributed to decreased freedom of expression, whereas Burkina Faso's results can be attributed to recent military coups that have rendered the nation unstable. Conversely, if someone's ability to express themselves is restricted, they are unable to object to the distortions that take place. But in Senegal, Côte d'Ivoire, Mali, Niger, and Togo, it has a favorable effect; in Togo, it is only 10%. Therefore, in Benin and Burkina Faso, the growth rate of the green economy is reduced by 1.777 and 0.384 units, respectively, for every unit increase in institutional quality (Dado Fabrice Degbedji, 2023)

Specifically, an increase of For Côte d'Ivoire, Mali, Niger, Senegal, and Togo, green growth increases by 1.013, 4.370, 0.164, 2.027, and 1.812 units for every unit increase in institutional quality respectively. Guinea-Bissau did not reveal any significant relationship in the area of the quality institutions and the growth of green initiatives. On the other hand, for Benin, Burkina Faso, Niger, and Senegal, one unit of increment in the measure of industrial development unit decreases green growth in the following units: 0.741, 1.2604, 0.085, and 8.523.While on the other side, one additional unit in the measure of industrial development results in an increase of 3,111 green growth units in Côte d'Ivoire, 1,194 green growth units in Mali, and 2,451 green growth units in Togo.

Comparative Analysis of Green Economy Efficiency and Conventional Green Economy Efficiency

The social justice index, comprehensive environmental pollution index, and resource input index were created using DPD software. In addition, MaxDEA 6.0 software was used to analyze input, expected output, and unexpected output data, presenting From 2005 to 2015, 26 cities in the Yangtze River Delta urban agglomeration were compared for green economic efficiency and traditional green economic efficiency.Efficiency figures from 2005, 2008, 2011, and 2015 were chosen for comparative study. This indicates that the green economy's efficiency within the metropolitan agglomeration of the Yangtze River Delta consistently lags behind the efficiency of the traditional green economy, showing a widening gap year by year. This suggests that the traditional green economic efficiency overestimates the actual green development achievements and reflects the pressing demand for improvement in the rationality of human welfare in this area. (Zhenbo Wang, 2019)

First, the large gap between efficiency of the green economy and efficiency of the traditional green economy has all along, been very far-fetched if GDP was to be taken as its sole wanted output efficiency indicator. In fact, it exaggerates regional green economy efficiency and exaggerates achievements in green development, which dampened some regional progress. Secondly, a comprehensive view of green economy efficiency matters

significant when looking on the whole picture of green development.

Though from the standpoint of regional average values, there is a trend of environmental economic efficiency declining, of traditional environmental economic efficiency increasing, and of desired output dropping with time. These opposite trends portray a gap increasing year by year. This divergence is because while GDP increases, the decreasing desired output means less social equity, which decreases with the growth of the economy. This means that within the façade of success in the urban cluster around the Yangtze River Delta, there emerges increased but non-egalitarian social injustice that worsens the situation by the day. Basically, the flow of the benefits of current results from green development is limited to the minority, showing a lack of wider benefits to society. Quality development in the future should be tied to sustainable development, and the fruit of development should be shared between the members of society in a rational way.

Spatial Cluster Analysis of Green Economic Efficiency

Within the metropolitan areas of the Yangtze River Delta, researchers looked into geographical correlation in green economic efficiency using the global Moran's I index. As the study employed Geoda's queen proximity weight matrix to generate Moran's I scatter plots, which revealed the spatial agglomeration characteristics of green economic efficiency in 2005, 2010, and 2015. The findings indicate that there is a there is a favorable association between The urban agglomeration of the Yangtze River Delta's green economic efficiency cities.The results are statistically significant at the 0.01 level, ensuring the reliability of the statistics.

The overall correlation is positive, and Spatial aggregation is present. The index of Moran's I shows that the trend initially weakened from 0.283567 in 2005 to 0.278595 in 2010, but then strengthened significantly to 0.347634 in 2015. An uneven development of green economic efficiency in cities is indicated by an evolutionary pattern from concentrated to diffused to reconcentrated is depicted by the scatterplot . Furthermore, how many points there are in the first sector rises while those in the third quadrant fall, indicating a strengthening of high-to-high agglomeration and a weakening of minimal to minimal grouping.

Analysis of Factors Affecting Green Economic Efficiency

The study using Moran's I index confirms the presence of a spatial correlation in green economic efficiency. To examine the correlation between green economic efficiency and other variables, a spatial econometric model was utilized. A fixed effects model is more appropriate, as the Hausman test rejected the hypothesis that individual effects have no bearing on the regression variables. Temporal fixed effects, fixed effects, and individual fixed effects were the three models that were calculated. The fixed effects model had the highest Adjusted R2 value, making it the best choice for estimating the general panel model.

To determine the most suitable model for analyzing green economic efficiency, LM and Robust tests were conducted to compare The models of the spatial error panel (SEPDM) and the spatial lag panel (SLPDM). According to the findings, SEPDM is more appropriate

because it passed the 1% significance, 5% significance test, although SLPDM was successful.. This conclusion was also confirmed by numerical value measures. The Durban spatial model (SDPDM) was evaluated further to see if it could be reduced to SEPDM or SLPDM using the likelihood ratio (LR) test and the Wald test . Both tests passed the 1% significance test, indicating that the SDPDM results are better than SEPDM, making it the more suitable choice for analyzing the influence mechanism of green economic efficiency.

The choice between two models—one with fixed effects and the other with random effects—for analyzing spatial data panel was made using the Hausman test. The test results' Hausman statistic, which was 0.4489, insufficient to meet the significance level requirement. This shows that the original premise—that is, that each effect is independent of the explanatory variables—cannot be disproved, indicating that A spatial panel model with random effects would be more appropriate.The results highlight the difference between conventional and three-dimensional panel models, which may be attributed to the standard panel method not accounting for spatial effects, potentially leading to deviations in the least squares estimation results.

Descriptive statistical tests were applied to examine the variables within the panel. Across 19 European countries, stock market returns exhibit significant negative correlations with the term spread, the second principal component, and the fifth principal component. Conversely, they show significant positive correlations with the third and ninth principal components. The strongest correlation is observed between the term spread and the second principal component, with a correlation coefficient of 32%. Additionally, multicollinearity is not a concern, as reflected in the Variance Inflation Factor (VIF) statistics, where the highest VIF is 1.38 and the average VIF is 1.07.

According to specifications 2 through 5, there is a negative correlation between the stock market returns of the next year and the three essential elements of green growth, which are based on a range of green growth indicators.

The study identifies three key components (PC2, PC3, and PC9) among the 12 principal components that significantly predict next year's stock market returns. These components, when considered individually or together, show an inverse correlation with the average stock market return. This means that movements in these components in a given year are followed by opposite movements in market returns. This finding supports the idea that indicators of green growth can be used to accurately predict future stock market returns. (Diana Abu-Ghunmi, 2023)

Green economy initiatives in the Waterberg region of Limpopo Province, southern Africa, have inadvertently exacerbated disparities in local water access, a consequence evident following the end of apartheid and the region's transformation into a wildlife destination under the green economy paradigm. While animal farms have benefited from reliable water supplies, rural poor communities resettled in Vaalwater have faced significant water shortages. Addressing these challenges, organizations like TNC and other eco-economy enterprises in the Waterberg have prioritized fostering community solidarity, implementing initiatives such as establishing new areas dedicated to game breeding and housing construction to support impoverished residents.

Disparities in water access between suburban and township areas stem from superior water infrastructure in suburbs and the ability of many residents to drill for water. Regarding livestock farms, differences between those in urban areas and townships primarily revolve around domestic water usage. Farmers raising animals typically resist redistributing water based on the natural hydrogeological boundaries of the Waterberg region. (Marcatelli, 2015)

Discussion

The research on green economy highlights the crucial role of research and development in driving technological progress and innovation. Additionally, investments in education are essential for enhancing human capital development, which is critical for the green economy's success.The nuanced economic outcomes underscore the heterogeneity among the selected economies. Across these economies, investment in education consistently strengthens human capital growth. Some Asian countries allocate relatively higher fiscal budgets to education, resulting in the development of efficient human resources and high educational standards. The economic analysis highlights a positive correlation between research and development expenditure and green economic growth. According to evolutionary economic theory and neoclassical economics, government spending plays a vital role in green economy initiatives. By investing in education and research and development, governments can address market failures and encourage innovation in new technologies. Since private sector spending alone is insufficient for significant breakthroughs, government financial support is crucial for advancing green growth initiatives.

Panel data analysis indicates that at the 1% significance level, the coefficient associated with a one-unit improvement in institutional quality within the West African Economic and Monetary Union (WAEMU) is expected to lead to a 1.375-unit increase in per capita green growth. These findings underscore the role of robust institutional frameworks characterized by effective governance, credible government commitments, and low corruption levels are key factors that contribute to a strong green economy., efficient judicial systems, and robust regulations in fostering sustainable green growth in South Asian nations. Notably, there is no significant association found between industry and Guinea Bissau in this context.

The analysis of the panel data reveals that industrial activity has a statistically significant positive impact on per capita green growth in the West African Economic and Monetary Union (WAEMU). Specifically, a one-unit increase in industrial activity is associated with a 2.155-unit increase in per capita green growth. This outcome implies that as industries expand and generate more wealth, they are likely to contribute less to environmental degradation. It suggests that these industries have the capacity to invest more in environmentally friendly technologies.

The study's findings show that the Durban spatial model is effective in analyzing The Yangtze River Delta urban agglomeration's green economic efficiency. The model reveals that certain factors, such as the tertiary industry's contribution to GDP, economic openness, government management, technological innovation, and education, positively influence

green economic efficiency. In contrast, urbanization has a negative impact. Additionally, the study finds that the proportion of secondary industry and degree of economic development in GDP have no significant effect. Furthermore, these factors also have spatial spillover effects on neighboring areas, indicating that the broader impact of tertiary industry, economic openness, technological innovation, and education on green economic efficiency extends beyond local boundaries.

To enhance the Yangtze River Delta urban agglomeration's green economic efficiency, it is recommended to increase the tertiary industry's contribution to GDP, enhance , Open up the economy and strengthen government administration foster scientific and technology innovation, enhance education levels., and promote quality-oriented urbanization. It is essential to consider Each factor's spatial spillover effects promote coordination among regions. Unlike previous research, the study finds that factors other than urbanization rate positively impact green economic efficiency. The negative impact of urbanization is attributed to its role in widening the urban-rural gap and reducing social equity, hindering progress in green economic efficiency. Future endeavors should stress coordinated growth integrate urban growth and rural rehabilitation between rural and urban areas and promote quality-oriented urbanization. The study's findings on spatial spillover effects highlight the interconnected regional development dynamics and the need for coordinated regional development strategies.

Green growth indicators serve as potential risk factors mirror shifts in future investment prospects for investors. The findings indicate that European stock market participants place value on green growth initiatives. Specifically, higher energy productivity correlates with lower overall stock market returns, whereas higher feed-in tariffs for solar power generation are associated with reduced future stock market returns. Thus, policies promoting green growth are projected to decrease future stock market returns, reflective of investors perceiving reduced market risk, particularly in terms of environmental and social factors.

Conservation efforts in the Waterberg region are fundamentally structured around maintaining existing power imbalances, which has hindered the equitable redistribution of land and water resources. In this context, animal farming plays a role in conserving water resources compared to irrigated crop farming, and it is not directly linked to the water shortages experienced in Vaalwater due to municipal inefficiencies. During apartheid, the water issue was primarily political and extended beyond simply enhancing service delivery in small, under-resourced towns and cities.

Conclusion

The conclusions from the research results that have been presented are as follows:

1. Effect of Education and R&D Expenditures on Green Economic Growth:
   The analysis of cross-sectional data reveals a strong positive correlation between investments in education and research and development (R&D) and economic growth. Specifically, a 1% increase in R&D spending is linked to a significant 1,010% boost in

green economic growth, while a similar increase in education spending is associated with a substantial 1,610% increase in green economic growth. These findings underscore that investments in R&D and education are pivotal in fostering green economic growth.

2. The Effect of Institutional Quality on Green Economic Growth:
   The findings from the FMOLS approach indicate that institutional quality has a significant impact on green economic growth. Benin and Burkina Faso have seen a decrease in green economic growth due to factors like constraints on freedom of expression and inadequate institutions. Conversely, countries such as Côte d'Ivoire, Mali, Niger, Senegal, and Togo are experiencing positive green economic growth attributed to enhanced institutional quality.
3. Green Economic Efficiency and Conventional Economic Efficiency:
   The comparison between green and conventional In the urban agglomeration of the Yangtze River Delta, economic efficiency reveals a significant disparity, with green economic efficiency lagging behind conventional efficiency. This highlights the need for intensified efforts to promote the development of the green economy in the region.
4. Analysis of Factors Affecting the Efficiency of the Green Economy:
   The study reveals that several key factors significantly contribute to enhancing green economy efficiency. These factors include the growth of tertiary industries, increased economic openness, effective government governance, technological innovation, and higher educational attainment. Conversely, urbanization levels negatively affect it. Enhancing regional coordination and improving development quality are anticipated to bolster green economy efficiency in the region.
5. Impact of Green Economic Practices on Water Access:
   Factors such as tertiary industry, economic openness, government governance, technological innovation, and educational attainment positively impact green economy efficiency. Conversely, urbanization levels negatively affect it. Enhancing regional coordination and improving development quality are anticipated to bolster green economy efficiency in the region.

   Overall, the results of this research highlight the importance of investing in education, research, institutional quality, and green economic practices to support sustainable green economic growth. Coordination between sectors and stakeholders is needed to achieve optimal green economic efficiency.

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