GOVERNANCE-DRIVEN SYNERGIES BETWEEN FOREIGN DIRECT INVESTMENT, RENEWABLE ENERGY CAPACITY, AND ECONOMIC GROWTH

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Abstract

Malawi is diligently advancing its energy infrastructure while concurrently attracting foreign direct investment (FDI) to foster economic growth. In this regard, comprehending the interaction between investments in renewable energy capacity and FDI inflows, with particular emphasis on governance, becomes imperative. This study is framed within the global transitions towards sustainable energy and regional endeavours to modernise infrastructure, rendering the investigation both pertinent and substantial. The study seeks to examine the correlation between Malawi's renewable energy capacity and FDI inflows, to stimulate economic growth. The study utilised data spanning from 1990 to 2023 and employed an autoregressive distributed lag (ARDL) model to assess the short-run and long-run impacts on gross domestic product (GDP). Results suggest that a 1 per cent increase in renewable energy output correlates with a 32 per cent increase in GDP in Malawi, whereas a percentage increase in FDI correlates with a 20 per cent increase in GDP. In the short term, the results indicate a speed of adjustment of approximately 134 per cent to achieve equilibrium within the economic model. The study concludes that investing in renewable energy substantially enhances Malawi's attractiveness to foreign investors and bolsters economic growth, recommending that the government prioritise these investments to synchronise energy policies while attracting external capital.

Keywords: Renewable Energy, FDI, Economic Growth

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1. INTRODUCTION

The rapid energy consumption of African countries, particularly in Sub-Saharan Africa, due to improved economic performance is attributed to high fossil fuel usage, contributing to greenhouse gas emissions and climate change (Adjei-Mantey & Adams, 2023); as global awareness of environmental sustainability intensifies, Malawi, blessed with abundant natural resources, has increasingly focused on enhancing renewable energy capacity to drive economic growth and attract foreign direct investment (FDI) (Gamula et al., 2013). Furthermore, Malawi's energy sector is in its early stages of development, with biomass being heavily used to meet energy demand. The energy mixes targeted by national energy policies are not being met, requiring new strategies. Energy supply remains a challenge, particularly for rural residents. Lack of direction, financial commitment, investment conditions, political will, and poverty contribute to underdevelopment, to mention a few (Gamula et al., 2013). This study embarks on a comprehensive investigation into the intricate relationship between Malawi's renewable energy capacity and the influx of FDI, which is essential for technological advancement and infrastructure development. By analysing the current state of Malawi's renewable energy initiatives alongside FDI trends, this study aims to elucidate how increased investment in sustainable energy can facilitate greater economic benefits (Gamula et al., 2013).

As Malawi aims to boost its renewable energy capacity, the significance of FDI becomes more prominent. The country is rich in natural resources, like sunlight and biomass, offering numerous avenues for renewable energy initiatives that could attract foreign investors (McCauley et al., 2022). Nevertheless, the sector requires a substantial overhaul, transitioning from a primary focus on infrastructure to the production of commodities, which demands a shift in investment strategies and increased donor participation (Dinga & Fonchamnyo, 2021). While FDI has the potential to drive economic growth by stimulating innovation and infrastructure enhancement, the link between renewable energy usage and economic development remains intricate (Komendantova et al., 2012).

Similarly, Zapototska and Skliarov (2019) researched the impact of alternative energy sources on Ukraine's sustainable development, focusing on economic growth, environmental sustainability, and social aspects. The study analysed policy documents, international agreements, energy production and consumption patterns, and investment trends. It emphasised the need for government support and a favourable business environment to advance sustainable development, along with protecting renewable energy investors. Qureshi et al. (2018) noted that fossil fuel consumption could benefit short-term economic growth but warned about potential long-term drawbacks of renewable energy if resources are used unproductively. For Malawi, aligning FDI with renewable energy is crucial for sustainable development (Gamula et al., 2013). Despite significant research on renewable energy and FDI for economic growth, specific studies in this field are limited. This study addresses the gap by examining the relationship between Malawi's renewable energy capacity and FDI inflows to support economic growth, aiming to clarify how energy policy attracts FDI and promotes sustainable development.

The rest of the paper is structured as follows. Section 2 reviews the literature. Section 3 presents methodology for exploring FDI and renewable energy synergy in Malawi. Section 4 provides and discusses the research findings. Section 5 concludes the paper.

2. LITERATURE REVIEW

The literature review assesses theoretical and empirical perspectives to understand how the relationship between FDI and renewable energy capacity contributes to economic advancement.

2.1. Theoretical framework

This study is supported by augmentation or efficiency effect theories. Thus, the impact of FDI on the environment has been debated due to contrasting theoretical perspectives. FDI can enhance environmental quality through increased efficiency, promoting growth and social welfare through increased investment and technology transfer (Adjei-Mantey & Adams, 2023).

2.2. Empirical literature review

Empirical research examining the relationship between FDI and renewable energy capacity yields varied results, indicating both direct and indirect influences. Consequently, this section offers a concise overview of the literature review pertinent to this study.

2.2.1. The current state of renewable energy in Malawi

African countries face challenges in providing modern energy services, increasing biomass dependency, and hindering poverty and the achievement of the Millennium Development Goals (Chirambo, 2014). Therefore, increased private sector involvement and strategic energy policies are deemed crucial for advancing Africa's energy infrastructure and capacity development (Chirambo, 2014). On the contrary, Malawi's renewable energy landscape is characterised by significant potential but marred by systemic challenges that hinder effective progress (Gamula et al., 2013). Despite the government's commitment to improve energy accessibility through renewable sources, the actual implementation of policies designed to promote these initiatives has been notably inadequate. Furthermore, McCauley et al. (2022) discuss the energy challenges in Sub-Saharan Africa, focusing on Malawi, highlighting the low electricity access and heavy reliance on wood fuel, leading to health issues and deforestation. These challenges require inclusive local governance and effective investment systems (McCauley et al., 2022). These conditions not only limit the growth of renewable energy capacity but also deter FDI, as investors seek stable environments. Thus, addressing structural deficiencies within the energy sector is crucial to unlocking Malawi's renewable potential and attracting much-needed FDI (Nasim et al., 2023). Similarly, Jara et al. (2019) show that India's high electricity costs hinder FDI. Therefore, solar photovoltaic grid-tied hybrid energy systems are emerging to reduce these expenses, but current net-metering policies restrict exports.

2.2.2. Analysis of renewable energy sources and their capacity

Analysing renewable energy sources and their potential is crucial to understanding their influence on economic growth and the attraction of FDI in Malawi. The country possesses ample solar, wind, and hydroelectric resources, offering a substantial opportunity to utilise renewable energy for broad electrification (Kayani et al., 2024). Yet, the present investment levels are drastically inadequate, as the existing financial pledges are at least five times less than what is needed to achieve universal clean energy access. In the East African region, while renewable energy projects are underway, numerous hurdles in financing, technology, and policy remain (Usman et al., 2024). Research by Saleem et al. (2024) on the effects of renewable energy, FDI, and external debt on Brazil's load capacity factor revealed that renewable energy enhances ecological sustainability, while natural resource rent improves load capacity.

In contrast, China's Global Power database indicates that fossil fuel plants in China contribute 314 million tons of CO_2 emissions annually, 3% of emissions outside its borders. To address this, China aims to curb global warming to 1.5 degrees Celsius by attracting FDI into renewables. (Ma, 2020). Policymakers should focus on capacity building, effective policies, and enhanced regulatory frameworks to ensure the sustainable use of both fossil fuels and renewable energies (Sun & Wang, 2023). Likewise, Zhang (2024) examined how renewable and non-renewable energy capacities affect the environment in 53 upper-middle-income nations from 1990 to 2020. The research found a positive correlation between renewable energy capacity and environmental health, emphasising the potential of renewable resources. The study also found that increased access to renewables boosts their generation and lessens dependency on non-renewables. This underscores the significance of policies that promote renewable energy adoption. Additionally, Hunt and Bloomfield (2024) report that India's population and economic growth have led to a 60% surge in installed renewable capacity, primarily due to a fivefold rise in solar capacity. Their evaluation of data from 1979 to 2022 indicates that solar capacity is evenly distributed across India, with maximum wind capacity during the monsoon. Wave energy emerges as a promising renewable source for the Andaman and Nicobar Islands. The current grid's vulnerabilities are highlighted, along with potential areas for forthcoming renewable investments.

2.2.3. The role of foreign direct investment in economic development

FDI is crucial in boosting economic advancement. In the context of renewable energy, Liu and Pan (2024) examined the relationship between natural resource expansion, green economic growth, and energy intensity in Asian regions. Their research indicates that economies benefit from utilising both organic and synthetic energy resources. It recommends revising real estate policies to address environmental decline and combat climate change effectively. Furthermore, the study highlights the significance of a green economy for maintaining long-term growth (Liu & Pan, 2024). Governments should prioritise energy efficiency and support environmentally friendly industries. Furthermore, Liu and Pan (2024) stipulate that China holds $115 billion in global electric power investments, with 73% ownership in 81 gigawatts of capacity. Most Chinese investments are in coal, gas, and hydropower, while wind and solar shares are small but potentially increasing. Between 2011 and 2017, 58% of Chinese coal greenfield investments used supercritical technologies, compared to 34% of non-Chinese plants. Malawi faces significant challenges in meeting its energy needs, as current financial flows are substantially below the requirements needed to ensure basic energy access for its population (McCauley et al., 2022). Therefore, the infusion of FDI can drive critical investments in renewable energy infrastructure, addressing the energy poverty that stifles economic growth and social progress (Najafi et al., 2015). FDI contributes not just financial resources but also facilitates the transfer of technology and expertise, which are crucial for creating sustainable energy infrastructures (Khare et al., 2022; Milanzi, 2025). In the context of Malawi, a nation with a low human development index ranking, tailored policies to draw FDI into the renewable energy sector could drive structural changes by enhancing energy access, fostering job creation, and ultimately bettering the quality of life for its population (Martinot et al., 1997). Additionally, Kenh and Wei (2025) explored the link between inward FDI and Cambodia's economic growth post-1993. Their study employed descriptive methods and industry-specific data to assess how FDI sectors affect growth. They discovered that both FDI and the comparative advantage index play significant roles in Cambodia's economic expansion. This research addresses a gap in existing studies and offers practical advice for policymakers to effectively leverage foreign investments while mitigating negative impacts on FDI inflows (Abdlaziz et al., 2025).

2.2.4. Examination of governance and foreign direct investment trends and their impact on the energy sector

The growing influence of FDI in the energy sector is especially notable in regions like Malawi, where sustainable energy is crucial (Qureshi et al., 2018). Switching from traditional to renewable energy sources can enhance efficiency and reduce environmental harm. Government funding, public-private collaborations, and FDI into bioenergy play a vital role in this transition (Saleem et al., 2024). To achieve energy independence, comprehensive government support is essential, which, in turn, promotes economic growth and environmental safety. FDI patterns reveal a focus on renewable energy initiatives to mitigate energy shortages and lower environmental impact (Yıldırım et al., 2024). Nonetheless, realising the potential benefits of these investments presents challenges. Similarly, Nawaz and Rahman (2023) assessed how financial development, institutional quality, FDI, and human capital affect renewable energy consumption in 31 Sub-Saharan African countries between 2002 and 2019. They found human capital and gross domestic product (GDP) per capita crucial in policy decisions, with a nonlinear relationship between GDP and energy use. Recommendations include increasing GDP per capita, enhancing human capabilities, and implementing financial and institutional reforms to fuel a shift in energy practices. The link between energy needs and economic growth is critical, as an efficient energy distribution network is key to improving living standards and economic progress. Additionally, Rahmandani and Dewi (2023) analysed renewable energy, carbon emissions, and FDI's role in the economic growth of low- and middle-income countries of the Organization of Islamic Cooperation. Their findings assert that renewable energy positively impacts economic growth, while carbon emissions also play a role. In middle-income countries, FDI has a substantial economic impact. Therefore, understanding FDI's role in Malawi's energy sector is crucial for creating policies that bolster renewable capacity and sustainable development (Adebayo et al., 2024). Raihan et al. (2025) studied renewable energy and FDI's effects on Egypt's economy, showing that a 1% increase in renewable energy utilisation and FDI could raise GDP by 1.02% and 1.87%, respectively, and by 0.54% and 1.11% in the short term. The study supports advancing sustainable energy innovations, enhancing FDI, and fostering economic growth.

Lastly, Lombana-Coy and Salcedo (2025) examined corporate governance's impact on FDI in Latin America, finding that accountability, board effectiveness, and home-country investor protection boost FDI flows. The research indicated that past FDI flows and the economic growth of investor nations significantly influence current FDI trends.

3. RESEARCH METHODOLOGY

The research utilised the autoregressive distributed lags (ARDL) bound test method. The ARDL model, originally introduced by Pesaran et al. (2001), represents a time series approach that enables the incorporation of lagged variables and error correction terms within a dynamic framework. Consequently, the ARDL panel data methodology serves as an instrumental tool for the economic analysis of panel datasets. ARDL effectively captures both short-term and long-term dynamics and presents an adaptable approach for analysing the interrelationships between variables within a panel dataset. The findings of this study will address the hypothesis positing a significant positive correlation between FDI in the renewable energy sector and economic growth in Malawi. Alternatively, the Johansen cointegration approach may be employed to analyse the study's outcomes.

3.1. Study data

The research utilised time series data spanning from 1990 to 2023. The data were sourced from Quantec EasyData (https://www.easydata.co.za/) to investigate the governance-driven synergies between FDI, renewable energy capacity, and economic growth in Malawi. The selection of the study period is constrained by the availability of data for all variables incorporated within the model. Table 1, presented below, provides an exposition of the variables employed in this study.

Table 1. Variable description

Variable	*Interpretation*	*Source*
GDP	GDP growth (annual% %)	Quantec EasyData
FDI	FDI (% of GDP)	Quantec EasyData
REO	Renewable electricity output (% of total electricity production)	Quantec EasyData

Source: Author's compilation.

3.2. Model specifications

Based on the variables given in Table 1 above, the model of this study has been specified as follows.

$$GDP_t = \beta_0 + \beta_1 FDI + \beta_2 + \mu \quad (1)$$

In Eq. (1) presented above, *GDP* denotes the annual growth percentages of gross domestic product, *FDI* signifies the proportion of foreign direct investment relative to GDP, and *REO* indicates the proportion of renewable electricity production within the total electricity production. Similarly, t = *time*, β_0 = *constant*, β_1, β_2 = *coefficients*, and μ = *error-term*.

The ARDL approach by Pesaran et al. (2001) was selected to estimate the link between the dependent variable and its regressors due to its capability to produce reliable results with small or finite sample sizes. The ARDL requires some variables to be stationary at I (0) and others at I (1) (Pesaran et al., 2001). It also addresses heteroskedasticity and autocorrelation effects. The ARDL equation is provided below:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta GDP_{t-1} + \sum_{i=1}^{m} \beta_2 \Delta FDI_{t-1} + \sum_{i=1}^{m} \beta_3 \Delta REO_{t-1} + \alpha_1 \Delta GDP_{t-1} + \alpha_2 \Delta FDI_{t-1} + \alpha_3 \Delta REO_{t-1} + \mu_{t-1} \quad (2)$$

In Eq. (2) above, β represents the intricate short-run dynamics of the model, providing a thrilling glimpse into its immediate, vibrant fluctuations, whereas α illustrates the enduring, steadfast long-run component of the model, which captures the profound, underlying trends with remarkable precision and depth. The *Δ* is the first difference between the operator, and the μ is the error term, which explains the difference between the theoretical value of the model and the actual observed results. Based on Eq. (2) above, the null hypothesis (H_0) is given as $H_0 = \beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$, meaning that there is no cointegration among the variables. The alternative hypothesis is formulated as $H_0 \neq \beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$ and represents the presence of cointegration among the variables.

Furthermore, the error correction model (ECM) of the ARDL is formulated as follows.

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 GDP_{t-1} + \sum_{i=1}^{m} \beta_2 FDI_{t-1} + \sum_{i=1}^{m} \beta_3 REO_{t-1} + ECM_{t-1} + \mu_{t-1} \quad (3)$$

where, λ is the coefficient of the error correction term (ECT), which captures the reversion and speed of adjustment to reach an equilibrium as explained by Pesaran et al. (2001).

4. RESULTS AND DISCUSSION

This study section presents statistical findings like descriptive statistics, unit root tests, diagnostic tests, and ARDL results. It aims to clarify the governance-driven synergies between FDI, renewable energy capacity, and economic growth in Malawi for policy decisions. Table 2 shows descriptive statistics.

Table 2. Descriptive statistics results

Variable	*GDP*	*FDI*	*LREO*
Mean	4.016432	1.544908	3.432483
Std. dev.	4.840783	1.779852	1.933190
Skewness	-0.670819	1.893199	-1.246027
Kurtosis	5.351101	6.101017	2.555831
Jarque-Bera	10.38086	33.93358	9.077457
Probability	0.005570	0.000000	0.010687

Source: Author's compilation.

Table 2 shows that *GDP* and *LREO* are left-skewed, and *FDI* is right-skewed. *FDI* has a heavier tail according to kurtosis values. The Jarque-Bera test reveals all variables deviate from normality, especially *FDI*, with a p-value of 0.0000. Table 3 details the unit root test results.

Table 3. Stationarity test results

Variable	*Model*	*T-statistic*	*P-value*	*Order*	*T-statistic*	*P-value*	*Order*
		ADF test			*DF-GLS test*		
GDP	Intercept	-7.665***	0.000	I (0)	-7.699**	0.010	I (0)
	Trend and intercept	-7.541***	0.000	I (0)	-7.705***	0.000	I (0)
FDI	Intercept	-4.553***	0.000	I (0)	-4.274***	0.000	I (0)
	Trend and intercept	-7.380***	0.000	I (0)	-5.087***	0.000	I (0)
LREO	Intercept	-5.662***	0.000	I (1)	-5.723**	0.0084	I (1)
	Trend and intercept	-5.714***	0.000	I (1)	-5.897***	0.0048	I (1)

*Note: *, *, *** significant level at 1%, 5%, and 10%, respectively, based on the critical values of the variables at intercept and intercept and trend, respectively.*
Source: Author's compilation.

The results of the unit root test presented in Table 3 above indicate that some variables are integrated of order zero, I (0), while others are integrated of order one, I (1). Consequently, the stationarity outcome justifies the application of the ARDL framework, as it facilitates the integration of both stationary and non-stationary variables (Pesaran et al., 2001). Moreover, the ARDL method allows for the inclusion of both levels and lags of I (0) variables and enables the specification of relationships without the loss of valuable information from the levels of I (1) variables. Subsequently, Table 4 below provides the ARDL test results.

Table 4. Bound test results

Bound test				*Value*		
F-statistic				*14.300500*		
	10%		*5%*		*1%*	
Sample size	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
30	2.915	3.695	3.538	4.428	5.155	6.265
35	2.845	3.623	3.478	4.335	4.948	6.028
Asymptotic	2.630	3.350	3.100	3.870	4.130	5.000

Note: I (0) and I (1) are, respectively, the stationary and non-stationary bounds.
Source: Author's compilation.

The findings of the bound test, as illustrated in Table 4, indicate that the ARDL bound test was conducted on three variables, which were segmented into two categories: integrated of order zero and one. The F-statistic exceeded the critical values at the 10%, 5%, 2.5%, and 1% significance levels, indicating the presence of cointegration. As a result, the null hypothesis (H_0) of no cointegration is rejected, given that the F-statistic value exceeds the upper bound critical value. Table 5, presented below, delineates the ARDL long-run results.

Table 5. Long-run results

Variable	*Coefficient*	*Standard error*	*T-statistic*	*P-value*
*GDP (-1) **	-1.335704	0.177431	-7.528031	0.0000
*FDI***	0.201678	0.487006	0.414119	0.0518
*LREO***	0.323130	0.442461	0.730301	0.0021

*Note: *, *, *** significant level at 1%, 5%, and 10%.*
Source: Author's compilation.

The long-run results from the ARDL model, as detailed in Table 5, indicate that a percentage increase in foreign direct investments would elevate the gross domestic product by 20%, while a 1% increase in renewable energy output is expected to boost it by 32%; Table 6 subsequently presents the ARDL short-run analysis and the ECM results.

Table 6. Short-run and error correction model results

Variable	*Coefficient*	*Std. Err.*	*T-statistic*	*P-value*
Cointegration equation*	-1.335704	0.168162	-7.983753	0.0000

*Note: * significance.*
Source: Author's compilation.

Furthermore, the findings shown in Table 6 reveal that the ECT coefficient (cointegration equation (-1) -1.335704) is both negative and significant. This indicates that the economic development model demonstrates a considerable adjustment rate of approximately 134%. Table 7 subsequently presents the diagnostic results as well as the robustness of the model.

Table 7. Diagnostic test results

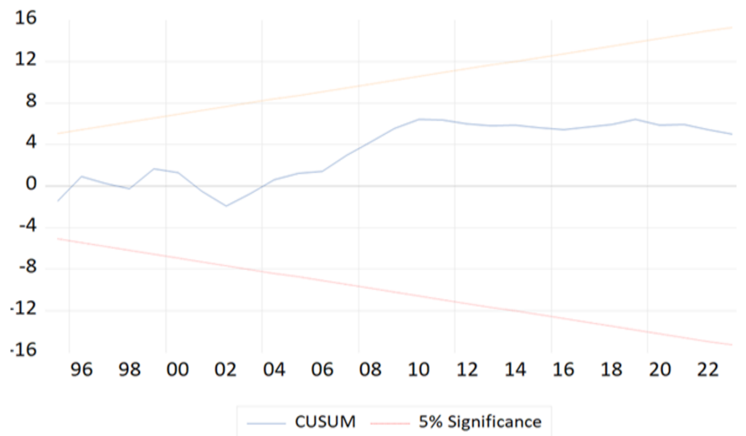
Diagnostic analysis	*Test*	*Null hypothesis (H_0)*	*P-value*	*Conclusions*
Normality	Jarque-Bera	Data are normally distributed.	0.6614	Fails to reject H_0 because p-value = 5%
Serial correlation	Breusch-Godfrey serial correlation LM test	No serial correlation.	0.8961	The null hypothesis is not rejected because the p-value exceeds the 5% level of significance
Heteroscedasticity	Breusch-Pagan-Godfrey	*H_0: Homoskedasticity* *H1: Heteroskedasticity*	0.8571	Does not reject the null hypothesis as the p-value exceeds the 5% level of significance.

Source: Author's compilation.

The diagnostic test presented in Table 7 demonstrates that the study does not reject the H_0 for three diagnostic tests, as the p-values exceed the 5% threshold. This outcome indicates that the model satisfies the requirements of autocorrelation and heteroskedasticity assessments, thereby reinforcing the validity of the ARDL model.

Figures 1 and 2 subsequently provide the cumulative sum test and the cumulative sum of squares test, which are instrumental in identifying structural changes within regression models over time, evaluating both stability and significant parameter shifts.

Figure 1. CUSUM test results



Source: Author's compilation using EViews 13 software.

Figure 2. CUSUM of squares test results

Source: Author's compilation using EViews 13 software.

Similarly, the results in Table 8, below, show Granger causality test results. The test determines predictive causality, indicating that past values of one variable can predict another, rather than establishing true causation.

Table 8. Granger causality test results

Null hypothesis	*F-statistic*	*P-value*	*Decision*
FDI does not Granger-cause GDP.	0.01710	0.9831	Accept the H_0
GDP does not Granger-cause FDI.	0.38789	0.6822	Accept the H_0
LREO does not Granger-cause GDP.	0.09500	0.9097	Accept the H_0
GDP does not Granger-cause LREO.	0.06774	0.9347	Accept the H_0
LREO does not cause FDI.	0.20126	0.8189	Accept the H_0
FDI does not Granger-cause LREO.	5.15691	0.0127	Reject the H_0

Source: Author's compilation.

The Granger Causality results in Table 8 above show that the study fails to reject the H_0 that *GDP* and *REO* do not Granger-cause *FDI*. Consequently, we accept that *FDI* does Granger-cause *REO*.

5. CONCLUSION

In concluding the governance-driven synergies between FDI, renewable energy capacity, and economic growth, it becomes clear in Malawi that improvements in energy infrastructure are crucial for fostering economic growth and attracting investment. The findings show that a 1% increase in renewable energy output results in a 32% rise in GDP in Malawi, while a percentage increase in FDI leads to a 20% increase in GDP. In the short term, the results suggest a speed of adjustment of approximately 134% towards the equilibrium of the economic model. Therefore, while renewable energy initiatives have considerable potential to enhance living standards and economic conditions, realising these benefits hinges on the vitality of local economies and the governance structures overseeing energy projects. As previously noted, the dynamics of energy demand and supply fundamentally shape national economic health, which is vital for attracting FDI. Moreover, collective efforts toward sustainable energy development can serve as a key mechanism for Malawi's broader socioeconomic progress and integration into global investment networks.

The study's outcome shows a positive correlation between the enhancement of renewable energy infrastructure and the increase in FDI towards economic growth. The results demonstrate that a dependable energy supply acts as a crucial incentive for foreign investors. This association highlights the necessity for policymakers to prioritise the advancement of renewable energy resources, which not only enhances energy security but also creates a more appealing business environment. Furthermore, enhancing public-private partnerships can intensify investments in renewable projects, thereby expediting sustainability achievements. Therefore, future policies should concentrate on developing regulatory frameworks that facilitate investment, establishing robust financing mechanisms, and providing incentives for renewable energy initiatives. By adopting these strategies, Malawi can leverage its energy potential to promote economic growth and attain long-term sustainability, thus establishing itself as an emerging market for foreign investors. The study is constrained by the variables utilised and the data range. Future research may expand the scope by incorporating or substituting variables with additional social or economic factors within the context of renewable energy, FDI, and economic growth.

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