

Green Financial Development, Institutions, and Sustainable Economic Growth in Africa

Joshua Yindenaba Abor
University of Ghana Business School



Outline

- Introduction
- Literature Review
- Methods
- Empirical Results
- Conclusion and Implications

Introduction (1)

- Green finance is gaining prominence and has become an important way to improve environmental quality and promote sustainable development.
- Need to understand the level of green finance required to maintain a resilient economy,
 - and the role that institutions play in ensuring that green finance can support sustainable growth of an economy.

Introduction (2)

- This certainly calls for an examination of the green finance–growth threshold nexus and the effect of institutional quality on the relationship.
- Though, recent studies have shown interest in green finance and support the proposition of “better finance, more growth”,
 - there is lack of empirics on the threshold of green finance that is beneficial to sustainable growth.

Introduction (3)

- Institutions have an important role to play in the green-finance-sustainable growth nexus.
 - Previous studies contend that a robust institutional structure with an integrated financial system is crucial for growth (see Abor et al., 2024; Ahmed et al., 2022; Law et al., 2013)
- The study examines the role of institutions in the relationship between green finance and sustainable economic growth.

Objectives of the Study

- The study specifically seeks to:
 - examine the effects of green financial development and institutions on sustainable economic growth
 - examine the threshold effect of green financial development on sustainable economic growth
 - investigate the interaction effect of green finance and institutions on sustainable economic growth.

Literature:

Green Finance and Growth (1)

- Green finance is crucial in promoting long-term economic growth while safeguarding natural resources and minimizing environmental damage (Hunjra, Hassan, et al., 2023; Mirza et al., 2023).
- It supports economic activity by financing renewable energy, infrastructure, and decarbonization initiatives (Sachs et al., 2019).

Literature:

Green Finance and Growth (2)

- While financial development is known to foster economic growth (Bist, 2018; Pan & Yang, 2019),
 - the role of green finance in driving high-quality economic development remains less clear, as its environmental impact varies with different levels of economic advancement (Sadiq et al., 2022).
- By directing capital toward eco-friendly projects, green finance can boost innovation, lower carbon emissions, and enhance economic resilience (Campiglio, 2016; Zhang et al., 2022).



Literature:

Institutions and Growth (1)

- Institutional quality is critical for guiding economies toward balanced development that integrates economic, environmental, and social objectives.
- Strong institutions foster a stable and transparent environment that supports the effective implementation of green finance initiatives.

Literature:

Institutions and Growth (2)

- Studies have shown that countries with robust institutions tend to experience more stable and sustained economic growth,
 - as they are better equipped to implement policies that foster innovation, environmental protection, and social equity (see Acemoglu & Robinson, 2010; Acemoglu & Robinson, 2010; Ahmed et al., 2022; Hunjra, Azam, et al., 2023; Addi & Abubakar, 2024).

Literature:

Institutions and Growth (3)

- Weak institutional frameworks can hinder sustainable economic growth, leading to inefficiencies and delays in progress (Urbano et al., 2020).
- Within this context, institutional quality is essential in shaping the relationship between green financial development and sustainable economic growth.

Literature:

Green Fin, Institutions and Growth (1)

- Robust institutions can enhance the effectiveness of green finance by implementing sound policies, reducing financial risks, and driving technological innovation.
- This has led to an increased focus on understanding how institutional quality influences the success of green finance in fostering sustainable growth.

Literature:

Green Fin. Institutions and Growth (2)

- Some studies have explored the complex, non-linear interactions between institutional quality, green finance, and sustainable growth (Ahmed et al., 2022; Salman et al., 2019; Sarkodie & Adams, 2018).
- The literature suggests that the effectiveness of green finance initiatives may vary according to the level of institutional development (Sadorsky, 2010).

Methods (1)

- Baseline Model

- Sustainable economic growth = f (Green financial development, Institutional quality, Control variables). (1)

- Dynamic System GMM

- $$Y_{jt} = \alpha_1 Y_{jt-1} + \sum_{l=1}^2 \beta_l X_{jt} + \sum_{l=1}^N \nu_l C_{jt} + \theta_j + \sigma_t + \varepsilon_{jt} \quad (2)$$

Methods (2)

- To investigate the threshold effect and interaction effect

➤ $SEG_{jt} = \alpha_1 SEG_{jt-1} + \alpha_2 GFD_{jt} + \alpha_3 GFD^2_{.jt} + \alpha_4 IQ_{jt} + \sum_{k=1}^N \beta_k X_{jt} + \gamma_j + \mu_t + \varepsilon_{jt}$
(3)

➤ $SEG_{jt} = \alpha_1 SEG_{jt-1} + \alpha_2 GFD_{jt} + \alpha_3 GFD^2_{.jt} + \alpha_4 IQ_{jt} + \Omega_1 (GFD_{jt} * IQ_{jt}) + \sum_{k=1}^N \beta_k X_{jt} + \gamma_j + \mu_t + \varepsilon_{jt}$
(4)

Methods (3)

- In equation 3, the threshold point of green financial development can be expressed as:

$$\begin{aligned} \blacktriangleright \frac{dy}{dx} = \frac{d(\text{Sustainable economic growth})_{jt}}{d(\text{Green finance development})_{jt}} &= \alpha_2 + \\ 2(\alpha_3)(\text{Green finance development}_{jt}) &= 0 \end{aligned} \quad (5)$$

Methods (4)

- Based on equation 3, the effect of a change in green financial development on SEG is given by:

➤ Net effect = $\frac{dy}{dx} = \frac{d(\text{sustainable economic growth})_{jt}}{d(\text{Green financial development})_{jt}} = \alpha_2 + \Omega_1 \text{Institutional quality}_{jt}$
(6)

- In equation 6, we expect a change in green financial development should lead to a change in the level of SEG at changing levels of the institutional quality

Methods (5)

Variable	Measurement	Data Source
Sustainable economic growth (SEG)	GDP per capita growth	World Development Indicator database
Green financial development (GFD)	Ratio of climate development finance-grant in million US\$ to GDP.	Development Assistance Committee's (DACs) donors' finance of various development projects categorised under Organisation for Economic Co-operation and Development (OECD) Rio Marker Creditor Reporting System (CRS) (OECD, 2018).
Institutional quality (Inst)	Aggregate of six indicators (rule of law, government effectiveness, control of corruption, political stability, regulatory quality, and voice and accountability).	World Governance Indicator database
Foreign direct investment (FDI)	Ratio of net inflows of FDI to GDP.	World Development Indicator database
Total Investment (Invt)	Natural logarithm of total investment),	World Development Indicator database
Industry Employment (Emp)	Employment in industry as a percent of total employment),	World Development Indicator database
Financial Openness (FO)	Financial openness index	IMF Financial Development database
Private Sector Credit (PSC)	Domestic credit to the private sector as a share of GDP),	World Development Indicator database
Population (Pop)	Annual population growth),	World Development Indicator database
Real Effective Exchange Rate (REX)	Real effective exchange rate Index	IMF Financial Development database

Empirical Results (1)

Table 1: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Sustainable Economic Growth	839	7.27	0.58	5.53	9.23
Green financial development	826	0.072	0.396	0	5.963
Institutional quality	794	-0.622	0.542	-1.887	.853
FDI inflows	740	8.793	41.133	-58.323	773.9
Total investments	755	24.83	9.313	-.098	62.268
Industry employment	810	13.088	7.5	2.051	32.631
Financial openness	750	0.223	0.416	0	1
Private sector credit	656	42.055	42.326	.347	218.944
Population growth	794	2.384	0.864	-2.629	4.655
Real effective exchange rate	912	34.722	47.57	0	142.626

Empirical Results (2)

Table 2: Pairwise Correlations

Variables	VIF	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) SEG		1.000									
(2) GFD	1.032	0.035	1.000								
(3) Inst	1.335	0.120	-0.020	1.000							
(4) FDI	1.009	0.048	-0.011	0.043	1.000						
(5) Inv	1.173	0.021	-0.052	0.192	-0.020	1.000					
(6) Emp	1.471	-0.125	0.120	-0.135	0.001	-0.055	1.000				
(7) FO	1.386	0.140	0.081	0.153	0.053	-0.044	0.136	1.000			
(8) PSC	1.121	0.030	-0.045	0.059	-0.018	-0.072	-0.196	-0.100	1.000		
(9) Pop	1.502	-0.085	0.001	-0.370	-0.071	-0.268	0.196	-0.041	-0.008	1.000	
(10) REXC	1.262	-0.021	-0.049	-0.226	0.011	0.055	-0.044	-0.063	-0.056	-0.089	1.000
VIF mean	1.254										

Empirical Results

Threshold Effect of GFD on SEG

VARIABLES	Pooled OLS Model 1	Fixed Effect Model 2	Random Effect Model 3	Dynamic System GMM Model 4
Sustainable Economic Growth _{t-1}				0.963*** (0.0708)
Green financial development	-0.0423** (0.0194)	-0.0468** (0.0230)	-0.0135* (0.00794)	-0.0164** (0.00735)
Green financial development ²	0.0509** (0.0190)	0.0100*** (0.00362)	0.00929** (0.00419)	0.00946** (0.00386)
Institutional quality	0.204 (0.156)	-0.000669 (0.00168)	-0.00311 (0.00226)	0.234* (0.133)
FDI inflows	0.00611*** (0.00184)	0.00439* (0.00225)	0.00768** (0.00351)	0.0387** (0.0175)
Total investment	-0.00692*** (0.00264)	-0.00694*** (0.00263)	-0.00692*** (0.00264)	-0.00693*** (0.00263)
Industry employment	-0.0168*** (0.00329)	-0.0182*** (0.00331)	-0.0168*** (0.00329)	-0.0182*** (0.00330)
Financial openness	0.146 (0.100)	0.123 (0.109)	0.146 (0.100)	0.569*** (0.130)
Private sector credit	-0.000580 (0.000791)	0.000153 (0.000831)	-0.000580 (0.000791)	0.00284*** (0.000948)
Population	-0.0183 (0.0341)	-0.0238 (0.0346)	-0.0183 (0.0341)	0.0579 (0.0588)
Real effective exchange rate	0.00283** (0.00140)	0.0109*** (0.00239)	0.00283** (0.00140)	0.00271** (0.00112)
Constant	7.524***	7.246***	7.524***	0.419*

Empirical Results

Interaction Effects of GFD and Inst on SEG

	Dynamic System GMM
VARIABLES	Model 5
Sustainable Economic Growth t_{-1}	0.964*** (0.0715)
Green financial development	-0.0247** (0.0117)
Green financial development ²	0.0103** (0.00399)
Institutional quality	0.566*** (0.192)
Green financial development × Institutional quality	0.0104*** (0.00349)
FDI inflows	0.0668** (0.0292)
Total investment	0.00114 (0.00589)
Industry employment	-0.0168* (0.0102)
Financial openness	0.571*** (0.130)
Private sector credit	0.00287*** (0.000957)
Population	0.0614 (0.0593)
Real effective exchange rate	0.00268**



Conclusion and Implications

- Observed a U-shaped relationship between green finance and SEG.
- GFD reduces SEG up to a threshold point of 0.8669, but begins to increase at an additional level of GFD.
 - An average level of GF may not be channeled into sustainable growth, but an additional increase in GF may provide incentives for its efficient use to improve SEG.

Conclusion and Implications

- We note that institutional quality promotes SEG in Africa.
- The negative linear effect of GF on SEG is reduced with increased level of institutional quality .
- An increase in institutional quality reduces the rate at which the initial level of GF reduces SEG.

Conclusion and Implications

- Need to develop and implement effective regulations and standards for GF to ensure that it aligns with SEG objectives.
- Promote blended finance models that combine concessional and commercial funding to support sustainable projects and reduce the risk of GF crowding out other investments.

Conclusion and Implications

- Foster collaboration among financial institutions, and other stakeholders to ensure that GF supports SEG.
- By implementing these policies, governments and financial institutions can help reduce the negative impact of GF on SEG and ensure that it supports long-term sustainable development.

Thank you