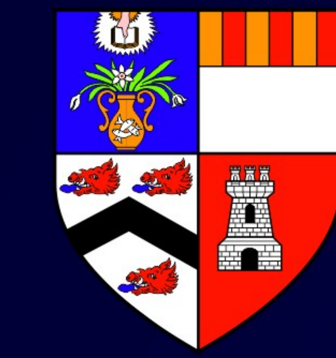
Title The Nexus Between Energy Consumption, Foreign Direct Investment and Economic Development in West Africa : A Panel Data Evidence

Name: Kwabena Boakye



1 4 9 5 UNIVERSITY OF ABERDEEN

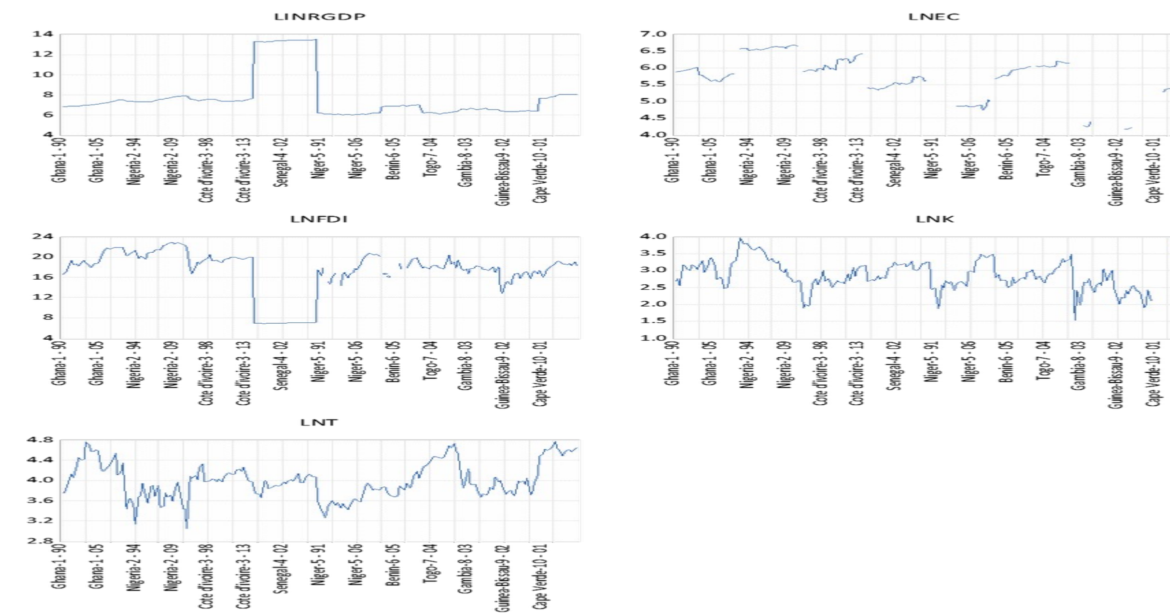
MOTIVATION

The provision of energy to the populace would inevitably trigger a direct and positive impact on any country's economic progress. Since access to energy plays a pivotal role or is at the heart of development in any country, the World Bank is committed to helping countries work towards universal access to affordable, reliable and sustainable energy as a key part of delivering on its twin goals of eradicating extreme poverty and promoting shared prosperity. Since 2010, the Bank has provided more than $5 billion for energy access in over 35 countries through some 70 projects. Most West African countries are also making efforts toward achieving sustainable energy for all by doubling the proportion of progress in energy efficiency and the share of the renewable energy mix. Nevertheless, several countries' energy sector faces encumbrances impeding the growth of that sector. The biggest hurdles are unreliable or expensive power, insufficient power generation capacity, poor transmission and distribution infrastructure, and power outages. The corollary is the inability of the energy sector to meet energy demand in some African countries. This has taken a toll on global industries and posed a key barrier to economic development in emerging economies. Energy prices have also skyrocketed for many consumers and businesses around the globe. This has triggered a reduction in energy consumption and a drastic fall in FDI inflows, leading to a decline in economic development. This, therefore, necessitates the need to examine the nexus between energy consumption, Foreign Direct Investment, and economic development in West Africa, as a study in this area has not been much explored.

The model is expressed in the form

$$Ln\ Y_t = \beta_0 + \beta_1 lnFDI_t + \beta_2 ln\ EC_t + \beta_3 ln\ K_t + \beta_4 lnT_t + \varepsilon_t \ldots\ldots\ldots\ldots (1)$$

- **Stationarity test via panel unit root test**
- **Long-run and short-run relationship analysis: co-integration test and Vector Auto regression (VAR) analysis.**



MAIN FINDINGS

Stationarity test of the series using the Levin-Lin-Chu. (LLC) and Im, Pesaran-Shin (IPS) test revealed that all the series were nonstationary at levels but tended to achieve stationarity when converted to the first difference. Our series for estimation is therefore said to be the first differenced stationary series and integrated of order one, I (1).

The Pedroni and Kao cointegration test found no evidence of a long-run equilibrium or relationship among the variables: (LNRGDP, LNEC, LNFDI, LNK and LNT)

The study found an insignificant negative relationship between energy consumption and economic growth which contradicts the growth hypothesis.

In addition, the study also finds a theoretically expected positive relationship between FDI inflows and real GDP per capita and is consistent with the findings of Balasubramanyam et al. (1991) and (Anwar and Nguyen,2010).

Moreover, the study also found a negative and significant relationship between capital stock (LNK) and real GDP per capita. The results contradict the findings of Omri and Kahouli (2014).

Finally, the study found a positive relationship between trade openness and real GDP per capita. This was conformable to our prior expectations and is consistent with the findings of Frankel and Romer (1999) and Alcalá and Ciccone (2004).

Table 9 Results of vector auto regression model

Variable	LNRGDP Coefficient	t-statistic
D(LNEC (-1))	-0.036	-0.808
D(LNFDI (-1))	0.002	0.347
D(LNK (-1))	-0.037**	-2.12
D(LNT (-1))	0.028	1.47

POLICY IMPLICATIONS

- Taking into account the results of the study, we offer the following policy implications: Since the results depicted a positive relationship between FDI and real GDP per capita, first off, in order to maintain the positive impact of FDI inflows on real GDP per capita, the governments of West African nations must put in place pragmatic policies that encourage FDI inflows. Generally speaking, a successful policy framework for FDI encourages political and economic stability, openness in entry and operation laws, fair treatment of domestic and foreign enterprises, and ensures the proper functioning and structure of markets. To increase economic growth, FDI must be effectively directed and integrated into West Africa's developing economies.

- Additionally, the findings of the study revealed a negative relationship between energy consumption and economic growth. The implication is that initiatives that encourage energy efficiency should be supported in order to lessen the intensity of non-renewable energy usage. The quantity of energy required to provide services like lighting, heating, cooling, and mobility is also decreased through energy efficiency. This would increase energy security and hasten West Africa's economic growth. The International Energy Agency (IEA) claims that affordable energy efficiency upgrades can have favourable macroeconomic effects, increasing economic activity and frequently creating more jobs. Therefore, in order to encourage economic progress, West African nations must promote the usage of renewable energy.

- Economic growth was found to be positively impacted by trade openness from the results. Additionally, we discovered a strong and beneficial complementarity between capital formation and trade openness in fostering economic growth. Therefore, the governments of West African countries need to eliminate trade barriers and boost international trade by decreasing and streamlining procedures and controls. The majority of developing nations export mostly raw materials across the globe. The countries should amend the composition of trade by adding value to exported commodities for an outward-oriented policy to have a far stronger impact on economic growth. Additionally, trade policy ought to encourage investment in capital-intensive industries.

Name Kwabena Boakye   email k.boakye.21@abdn.ac.uk
University of Aberdeen, King's College, Aberdeen, AB24 3FX