

A MULTIVARIATE ANALYSIS OF INTER-COUNTRY DIFFERENTIALS IN ELECTRICITY SUPPLY IN AFRICA

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Ambe J. Njoh, Ph.D.,

Professor of Environmental Science & Policy

OUTLINE

- **Background: the origins of electricity in Africa;**
- **The literature: colonialism & development;**
- **Data & Methodology**
 - **Variables;**
 - **Model specification.**
- **Main Findings**
- **Discussion of Findings.**

BACKGROUND

- **The origins of modern electricity in Africa;**
- **Colonialism as a major conduit for the diffusion of electricity technology;**
- **Post-coloniality and the electricity scarcity problematic.**

THE LITERATURE

Colonialism & Development:

- 3 main schools of thought:
 - Colonialism impacts post-colonial development positively;
 - Colonialism impacts post-colonial development negatively;
 - The impact of colonialism on post-colonial development inconclusive.

CENTRAL RESEARCH QUESTIONS

- 1. Are there inter-country disparities in the electricity supply capabilities of African countries?
- 2. To what extent are disparities in electricity supply capabilities a function of colonialism in Africa?

CENTRAL RESEARCH QUESTIONS

- 3. What is the nature of the relationship, if any, between colonialism and electricity supply capabilities of African countries?
- 4. To what extent are inter-country differentials in electricity supply a function of the varying colonial experiences of African countries?

CENTRAL RESEARCH QUESTIONS

- 5. What aspect of colonialism is the strongest determinant of inter-country variabilities in electricity supply capabilities in Africa?

DATA & METHODOLOGY

Data Sources:

- UN Energy Statistics Yearbook;
- UN Demographic Yearbook;
- Penn World Tables from the University of Pennsylvania;
- CIA World Factbook.

DATA & METHODOLOGY

Variables:

- 1 DV = Electricity Supply (ELECSUP);
- *Predictor Variables (4):*
 - 1. Per capita GDP in 1960 (PCGDP60);
 - 2. Duration of colonialism (COLDUR);
 - 3. Population of main colonial city in 1960;
 - 4. Colonization type (settler or exploitation);
 - 5. Colonial Administrative Strategy (a binary variable).

MAIN VARIABLES SUMMARIZED

Main Variables:

- Electricity supply capabilities;
- Extent of colonial investment;
- **Intensity of colonialism;**
- **Colonization type (settler vs. exploitation)**
- Extent of colonially-induced urbanization;
and
- Colonial administrative strategy.

MODEL SPECIFICATION

General Linear Model (GLM):

- Addressing the central questions of the study entailed linking a dependent variable (DV), say Y , to a set of observable predictor variables, X_1, X_2, \dots, X_m , an unobservable term (the error term) ε , and corresponding parameters $\beta_1, \beta_2, \dots, \beta_k$ through some function, f .

MODEL SPECIFICATION

- This can be mathematically represented in the following terms:

- $Y = f(X_1, X_2, \dots, X_m, \varepsilon, \theta_1, \dots, \theta_k) \dots (1)$

- $f(X_1, X_2, \dots, X_m, \varepsilon, \theta_1, \dots, \theta_k) = \theta_1 X_1 + \theta_2 X_2 + \dots + \theta_{k-1} X_{k-1} + \theta_k + \varepsilon, m = k-1 \dots \dots \dots (2)$

MODEL SPECIFICATION

- Re-stating the equation on the previous slide in linear regression terms produces the following familiar ordinary least square (OLS) or general linear model (GLM):

- $$Y = \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{k-1} X_{k-1} + \beta_k + \varepsilon \dots \dots \dots (3)$$

MODEL SPECIFICATION

- $S = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$
.....(4)

- Where,
- S = the electricity supply per capita in any given country measured;
- α = the Y-intercept;
- $\beta_1 \dots \beta_5$ = the slopes associated with each of the four predictor variables in the model;

MODEL SPECIFICATION

- X_1 = Colonizer's nationality, a proxy for colonial administrative style;
- X_2 = duration of colonial era;
- X_3 = GDP per capita in 1960;
- X_4 = Size of largest colonial city in 1960;
- X_5 = *Colonization type*.
- ε = the error term.

MAIN FINDINGS

- There is a statistically significant positive link between Electricity supply capabilities and each of the following ($p < .005$):
 - Extent of colonial investment;
 - **Intensity of colonialism;**
 - **Colonization type (settler vs. exploitation);**
 - Extent of colonially-induced urbanization;

MAIN FINDINGS

- The relationship is positive but not statistically significant with:
 - Colonial administrative strategy.

DISCUSSION

- Different colonial authorities employed different administrative strategies;
- Ex: Indirect vs. direct rule;
- 'Indirectly ruled' countries are doing better in administering sub-national projects;
- 'Directly ruled' countries do better with national development projects.

DISCUSSION

- The longer the colonial duration the better a country's electricity supply capabilities:
 - Longer duration of colonialism meant longer time to develop public infrastructure including electricity.
- Former settler colonies do better than former colonies of exploitation with respect to electricity supply.

DISCUSSION

- The higher the level of colonially-induced urbanization the better a country's electricity supply capabilities:
 - Urbanization in European ethos = modernization and electricity = modernization

DISCUSSION

- The higher the per capita GDP at the eve of independence, the better a country's electricity supply capabilities:
 - Higher per capita GDP means the country started off on a good foot.

CONCLUDING REMARKS

It is tempting to recommend a return to colonialism for Africa based on the revelations of this study.

However, that would be wrong-headed.

CONCLUDING REMARKS

Rather, what the findings suggests is that the indigenous leadership in these countries must find out and emulate the example of their colonial predecessors in doing more with less.



*The End.
Thank You For Your
Attention*
