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Determinants of Aggregate Electricity Consumption in Ghana: A Multivariate Time Series Analysis

Authors : Renata Konadu

Abstract : In Ghana, electricity has become the main form of energy which all sectors of the economy rely on for their businesses. Therefore, as the economy grows, the demand and consumption of electricity also grow alongside due to the heavy dependence on it. However, since the supply of electricity has not increased to match the demand, there has been frequent power outages and load shedding affecting business performances. To solve this problem and advance policies to secure electricity in Ghana, it is imperative that those factors that cause consumption to increase be analysed by considering the three classes of consumers; residential, industrial and non-residential. The main argument, however, is that, export of electricity to other neighbouring countries should be included in the electricity consumption model and considered as one of the significant factors which can decrease or increase consumption. The author made use of multivariate time series data from 1980-2010 and econometric models such as Ordinary Least Squares (OLS) and Vector Error Correction Model. Findings show that GDP growth, urban population growth, electricity exports and industry value added to GDP were cointegrated. The results also showed that there is unidirectional causality from electricity export and GDP growth and Industry value added to GDP to electricity consumption in the long run. However, in the short run, there was found to be a directional causality among all the variables and electricity consumption. The results have useful implication for energy policy makers especially with regards to electricity consumption, demand, and supply.

Keywords : electricity consumption, energy policy, GDP growth, vector error correction model
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