

# ***EFFECTS OF ENERGY PRICES ON ECONOMIC GROWTH***

Kwanruetai Boonyasana  
Rajamangala University of Technology Pranakorn (RMUTP), Faculty of Business Administration,  
86 Suan Chitlada, Dusit, Bangkok, Thailand. 10300  
E-mail: kwanruetai@live.com, Phone +66 (0)839809363

## **Overview**

There is growing concern over greenhouse gas emissions in the United Kingdom (UK), and their possible impact on the cost of energy. The Department of Energy and Climate Change affirms that energy is a key factor in the UK's economic growth (DECC, 2013). This paper applies the model of Garen et al. (2011) to examine whether increases in energy price with regard to electricity, gas, solid fuel and liquid fuel (motor fuel and oil) can reduce real gross domestic product (GDP). Time series analysis of biannual data from 1996 to 2013 is used to determine real GDP. Empirical results show that, for the UK, electricity and solid fuel price increases are each significant in having a negative effect on real GDP, thus supporting the hypothesis. However, there appears no negative impact from gas, motor fuel and oil price increases - possibly because of the government's tax and subsidy policies. Section one of this paper deals with the introduction; section two, motivation; section three, methods and procedures; section four, empirical results; section five, discussion; and section six, conclusion.

## **Methods**

Time series analysis (lagged dependent variable) is employed in this study. Before conducting time series tests on the variables, the Augmented Dickey-Fuller (ADF) unit root test is used to check for stationarity. For results to be consistent, there is a requirement of no serial correlation in the error terms (Green, 2008).

## **Results**

From Model 1, which includes the gas price independent variable, the results show that increases in electricity and solid fuel prices are each found to significantly decrease real GDP. However, for gas and liquid fuel price increases, the results are not statistically significant. In Model 2, which does not include the gas price independent variable, the pattern of findings is similar to that of Model 1.

## **Conclusions**

This paper explores the effects of energy prices on real GDP growth, following the model of Garen et al. (2011). The results indicate that electricity and solid fuel price increases each have a significant negative effect on real GDP, but this is not the case for gas and liquid fuel price increases. As a result, UK policy makers should be attentive to any increase in the price of electricity and solid fuel, as it can be detrimental to economic growth and sustainable development.

## **References**

- Acaravci, A. and Ozturk, I. (2012). "On the Relationship between Energy Consumption, CO2 Emissions and Economic Growth in Europe. *Energy*, 35(12): 5412-5420.
- Asafu-Adjaye, J. (2000). "The Relationship between Energy Consumption, Energy Prices and Economic Growth: Time Series Evidence from Asian Developing Countries. *Energy Economics*, 22(6): 615-625.
- Belke, A., Dobnik, F. and Dreger, C. (2011). "Energy Consumption and Economic Growth: New Insights into the Cointegration Relationship. *Energy Economics*, 33(5): 782-789.
- California Energy Commission. (2010). "Summer 2010 Electricity Supply and Demand Outlook." Staff Report, *California Energy Commission*. March. Available at: <http://www.energy.ca.gov/2010publications/CEC-200-2010-003/CEC-200-2010-003.PDF>
- Department of Energy & Climate change. (2009). "Estimated Impacts of Energy and Climate Change Policies on Energy Prices and Bills." *Department of Energy & Climate Change*, London.
- Department of Energy & Climate change. (2013). "The Oil and Gas activities of the Energy Development Unit" *Department of Energy & Climate Change*, London.

- Dickey, D.A. and Fuller, W.A. (1981). "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." *Econometrica* 49: 1057-1072.
- Durbin, J. and Watson, G.S. (1950). "Testing for Serial Correlation in Least-squares Regression, I." *Biometrika* 37:409-428.
- EIA. (2012). "International Annual Energy Outlook." *EIA (Energy Information Administration)*. September.
- Garen, J., Jepsen, C. and Saunoris, J. (2011). "The Relationship between Electricity Prices and Electricity Demand, Economic Growth, and Employment." *Center for Business and Economic Research, Department of Economics, University of Kentucky*.
- Geman, H. and Roncoroni, A. (2006). "Understanding the Fine Structure of Electricity Prices." *Journal of Business*. 79(3): 1225-1261.
- Green, W.H. (2008). "Econometric Analysis." 6th ed. *Upper Saddle River, N.J. Prentice Hall*.
- Harris, C. (2006). "Electricity Markets: Pricing, Structures and Economics." *John Wiley & Sons*. West Sussex.
- IEA. (2010). "World Energy Outlook 2009." *IEA (International Energy Agency)*, Paris. November. Available at : <http://www.iea.org/Textbase/npsum/weo2010sum.pdf>