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The influence of climate change on the demand for ethanol

The causal link from emissions due to combustion fossil fuels to deliver energy services to climate change is well established. Climate change is expected to affect energy markets in various ways, both directly and indirectly. Directly, energy demand will be affected by extreme temperature changes, because higher temperatures imply less energy for heating and more demand for cooling, in addition to variations in the demand for energy as a production factor. The Advanced Energy Initiative-AEI proposes that the US must progress beyond a petroleum based economy and devise new methods such as ethanol to power automobiles. The main objective of this study is to determine the influence of climate on US ethanol energy demand using state level panel data from 1970 to 2014. The duality of cost minimization is utilized to examine the effects of climate on ethanol use in the commercial, transportation and industrial sectors using a Translog cost function. The first order conditions of cost function provide sectorial compensated demand for ethanol and substitution elasticity between sectors. A system of demand shares equations representing the sectors explained by prices, technology and climatic variables as exogenous variables is estimated. The commercial sector price is used to normalize the equations and hold the homogeneity and symmetry conditions. The estimated parameters are used to construct price elasticity and Hick-Allen elasticity of substitution for ethanol demand. Preliminary results indicate that improvement in technological efficiencies reduces ethanol use in the industrial while transportation shows an increase. The same results hold for precipitation.

Biography

Osei-Agyeman Yeboah is a member of the NC A&T faculty for the past 13 years. His scientific interests began at the Kwame Nkrumah University of Science and Technology in his native Ghana, where he earned an Undergraduate degree in Agricultural Science. After working as an Assistant Agricultural Economist In charge of Agricultural Statistics from 1987 to 1991 in the Ministry of Food and Agriculture, Ghana, he came to NCA&T to earn a Master's degree in Production Economics in 1993 and a Doctorate in Agricultural Economics (Resource Economics/International Agricultural Trade) at University of Nebraska-Lincoln in 1998. He served as a Post-doctoral Research Fellow at University of Nebraska-Lincoln USA EPA funded grant project from 1998 to 2000. In January 2001, he became Visiting Scholar teaching MS and PhD courses in resource economics at Auburn University, Alabama. He was also an adjunct faculty at the Auburn University Environmental Institute. In September 2003, he returned to North Carolina Agricultural and Technical State University in the Department of Agribusiness & Applied Economics as an Assistant Professor in international trade, international marketing, and agribusiness marketing. In April 2004, he became the Interim Director of the North Carolina A&T International Trade Center and was promoted to Associate Professor in 2009; Professor in 2014; and Professor and Director in 2016. He received Gamma Sigma Delta award of Excellence in Research in 2008; and the University's Senior Excellence in Research Award in 2013. He is a recipient of many grants and awards from agencies such as USDA and USIAD. Most recently, including evaluation of alternative storage technologies for maize in Ghana; and strengthening the peanut value chain in Ghana, all USDA-FAS funded projects. He is a member of the American Agricultural Economics Association.

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