

Energy Consumption and Economic Growth Nexus in China: Autoregressive Distributed Lag (ARDL)

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Abstract

This paper intends to investigate the nexus between energy consumption, carbon dioxide emission, total export and economic growth of China from 1971 to 2014. This study adopted Autoregressive Distributed Lag (ARDL) bounds test to examine the existence of short-run and long-run relationships among the variables. Empirical findings indicated that energy consumption contribute to economic growth while carbon dioxide emission is impeding the growth. There is a positive long-run relationship between both energy consumption and total export with economic growth of China. However, a negative relationship is observed between carbon dioxide emissions and economic growth. Hence, in terms of policy recommendation, policymakers can implement a balance environment-economic policy; reduce the carbon

dioxide emission by imposing carbon tax; promote renewable energy among the industries and households and promoting reserves forest policy is needed for aspiration of sustainable growth for both environmental and economic.

Keywords: energy consumption, carbon dioxide emission, autoregressive distributed lag

1. Introduction

The environmental crisis is a worldwide ongoing concern for all the countries since 1970s. Issues that associated with the environmental crisis are not only the environmental problem, but it can be related to the economic, social, and technological issues. The main features of the environmental crisis such as climate change, the depletion of stratospheric ozone, degraded air and water quality, deforestation, and soil erosion and degradation will affect the quality of the environmental and the health of life-being. In addition, the environmental crisis that related to economic such as increase in the number of populations rapidly, urbanisation and peak oil and energy security will also bring negative impact to environment. Hence, the environmental crisis had become the biggest challenge to all countries and the government need to work out the best solution in order to tackle environment issues.

China, the world largest developing economies have experienced an average 7.1 per cent growth over the past half-decade. Although the rapid increase in economic growth, its environmental crisis is getting worst. Based on the data released by World Development Indicators (WDI), the total consumption of energy (kg of oil equivalent per capita) of China experiencing rapid increase almost 381.09 % from 464.93kg to 2236.73kg from 1971 to 2014 (refer to Figure 2). Moreover, air pollution that caused by the increasing amount of carbon dioxide emission critically affects the environmental problem in China. The carbon dioxide emission in China has risen dramatically over a half-century (refer to Figure 3). According to Hays (2015), the increase in carbon dioxide emission is mostly caused by energy consumption such as coal consumption which major used for power generation in the industry field. In addition, China is the top coal and lignite consumption consumers worldwide exceed with India and the United States (Enerdata, 2018).

The surplus of carbon emission emissions will contribute to the greenhouse effect in China and cause the environmental crisis which eventually affects the health of the citizen. From the microeconomic perspective, the rapid increase in total exports can contribute to the environmental crises. In the sense that, growing on production for goods to sustain the market demand leading an increasing energy consumption for production needs which eventually it contributed on the emission of air pollutant that affects the environment and living things. A rapid increase in both emissions of carbon dioxide and energy consumption become the main issues that need to be a concern by policy-makers.

However, energy consumption and GDP do not have any clear-cut decision. Some of the research that investigated the energy consumption, emission of carbon dioxide and economic growth had come out with different views. The findings from those researches are controversial in both theory and empirical. Hence, the purpose of this study is to empirical determine the impact of energy consumption on the economic growth of China by also