



Istanbul Conference of Economics and Finance, ICEF 2015, 22-23 October 2015, Istanbul, Turkey

Defense, Economic Growth and Energy Consumption in China

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Abstract

This paper aimed to test the dynamic relationship between economic growth, energy consumption and defence expenditure in China for the period 1987–2013. It was used to the bounds test approach to cointegration developed by Pesaran et al. (2001) and it was determined whether there was a short and a long-run relationship among defence expenditure, energy consumption and economic growth. It was found that defence and energy consumption has a positive and a statistically significant impact on economic growth of China. Further, it was applied the Granger causality and it was determined a positive and a significant causal relation between variables.

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Peer-review under responsibility of the Organizing Committee of ICEF 2015.

Keywords: ARDL, Defense Expenditure, Economic Growth, Energy Consumption, Granger Causality

1. Introduction

Energy consumption and defense are major themes that have impact on economic development and growth. The experience of developed countries shows that the energy consumption and defense expenditure play a crucial role as a key factor in improving the quality of life of the people.

Economic growth accelerates defense sector and energy consumption, on the other side the defense sector stimulates to economic growth and energy consumption. The relationship between the economic growth, defense expenditure and energy consumption is complex and related with each other.

After World Wars I. and II., the scale and the capabilities of the military, new weapons in capable of immense destruction, changed warfare etc. (Clark et.al:2010) effected defense expenditure, energy consumption and

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economic growth. Energy consumption increased in effect of the new weapons developed by the scientist and economic growth. Especially after the Second World War, the scale and the capabilities of the military became very important for economic growth and energy consumption.

Defense sector consumes large amounts of fossil energy in planes, ships, and tanks (Jorgenson et.al:2010.) even, in peace time, military institutions and their activities (York 2008; Jorgenson et.al:2010). For example, in the 1980s, “nearly a quarter of all jet fuel” was consumed by militaries throughout the world; and approximately three-quarters of the oil consumed by the armed forces fuels the vehicles, aircrafts, sea vessels, and other forms of warfare machinery (Renner 1997).

This study aims to analyze the causal relation between energy consumption, economic growth, and military expenditure in China.

This study is the first paper analysed the relation between these variables, using cointegration and causality methods. It can be considered as complementary of the studies in literature of energy and defense economics. Auto Regressive Distributed Lag Bounds(ARDL) test is used to determine if economic growth, energy consumption and nations' military establishments are cointegrated for Chia in a stable manner for whole period.

Since a long and short-run relationships between the variables are important for China's energy policy and strategy. ARDL approach tests if the existence or absences of long-run relationship between the military expenditure, economic growth and energy consumption, but it does not determine causal relationship between variables. Granger causality test used to determine causality. And lastly, it was used generalized forecast-error variance decomposition technique proposed by Pesaran et.al (2001) to test the strength of the casuality test

The second section highlights the relation between variables. In the third section, data specifications and econometric methodology are identified. The fourth section consists of the empirical results and the last section give conclusions and policy implications.

2. Energy Consumption, Economic Growth and Defense Expenditure in China

China's economic growth is closely linked to the country's energy consumption and defense expenditure, and the world's energy consumption and economic growth is increasingly base on China's economic growth.

In effect of economic growth, China's defense sector has lived a dramatic change since the late-1990s, and its companies and research institutes continue to re-organize in an effort to improve weapon system research, development and production capabilities.

China has a powerful and potentially destabilizing military force—a regional and a political superpower (Muldavin: 1997) And defense sector consume large amounts of energy in planes, ships, and tanks. Even in peace time, military institutions and their activities consume vast amounts of fossil energy for research and development, maintenance, and operation.

These capital-intensive militaries employ equipment, personnel and advanced weaponry that require an enormous amount of fossil fuel energy (Clark et al. 2010; Jorgenson et.al:2012). Modern high-tech militaries with planes, helicopters, ships, tanks and armed vehicles etc. consume enormous amounts of fossil-fuel energy.

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