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## Effects of Energy Consumption on Growth in Eurasian Countries

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### Abstract

Some Eurasian countries play major roles in the world energy market as producers of oil and natural gas as well as being energy distribution centers. However, energy intensities of these countries are also very high compared to other transition countries in the world. This study aims at analyzing the relationship between energy consumption and economic growth in Eurasian Countries for 1992-2010 period. Empirical results reveal that energy consumption and economic growth are cointegrated for these countries. Furthermore, there is positive bidirectional causality between energy consumption and economic growth in the long run which supports the feedback hypothesis. Hence, policymakers in the Eurasia region should consider improving the energy infrastructure and increasing the energy supply to achieve higher economic growth when designing energy policies, whereas energy conservation policies should not be implemented for these countries since it may negative effect on economic growth.

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### 1. Introduction

Here Energy has extreme importance in human life and development. The demand for energy has been accelerating from the beginning of the history with the urbanization and economic development. Also, the demand for energy is expected to be higher and higher in the future as the development of economies and increase in the population continues. Estimates suggest that the world population is expected to double until 2050 and reach eight

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billion people (Dincer and Rosen, 1999). This population increase will be realized especially in developing countries. Asif and Muneer (2007) argue that this population growth and improvements in living standards generate a new and fundamental issue that sustainable economic growth without exceeding the environmental constraints and exhausting the scarce resources of the planet. Rate of increase in the global production has been accelerated for last decades and this inevitable growth puts a high pressure on natural resources. Migration to the crowded cities for socioeconomic reasons has also contributed to the increased demand for energy since energy consumption rise with economic activity and high income levels. However, capital, labor, and in the longer term even natural resources are reproducible factors of production, while energy is not a reproducible factor of production (Stern, 1999). Therefore, natural scientists and economists have studied much on energy's role and availability in the production and economic growth processes (Hall et al., 2001). In the extreme, energy use rather than output of goods is used as an indicator of the state of economic development (Kardashev, 1964).

Cornillie and Fankhauser (2004) indicated that energy intensity of most of the Commonwealth Independent States (CIS) have increased while some of them were stable in the transition process and argued that the decline in the total use of energy in the transition period of these countries can be attributed to the decline in general economic activity since energy intensity has increased. In those countries, new and efficient capital inflows to the industrial sectors could not be provided due to delayed privatizations. Extensive use of energy without payment through subsidies and nonpayment of energy bills also contributed to the intensity problem. Under communist decades, developing the energy-intensive industrial sector was emphasized, causing the energy intensity higher than in the West. The energy sector, a significant component of any economy was considerably reformed in these countries following the revolutions. (Gros and Steinherr, 2004). Increasing energy efficiency to reduce energy consumption was one of the main goals since higher energy price stimulate research and development of new technologies that would reduce energy consumption. As However, Polimeni and Polimeni (2007) argued that energy efficiency leads to increased consumption of energy. Their argument known as 'Jevons Paradox' concludes that increased demand for a resource due to efficiency will occur because of a rising level of possible production (Jevons 1865). Therefore, policies promoting energy efficiency would likely not reduce energy consumption in these countries. Thus, economic reforms that began to restructure production and consumption patterns in the early 1990s did not provide much improvement in energy intensity.

The difference in energy intensity between OECD countries and transition countries is sometimes seen as an indicator of the latter region's energy inefficiency. According to Dobozi (1991), central planning that estimates energy demand with upward biased, a large reliance on heavy industries and energy resources in some countries, artificially low energy prices, poor performance standards, the lack of incentives and mechanisms to save energy and deceleration of technological progress have been the main reasons for this inefficiency. Nevertheless, the differences in energy intensity could not be understood as differences in energy efficiency. "Energy use depends on socio-economic and environmental circumstances, such as comparative advantages for energy-intensive activity, resource endowment, population density and climate and energy efficiency is a measure of how resourcefully energy is used under these conditions" (Cornillie and Frankhauser, 2004).

The aim of this study is to estimate the relationships between energy consumption and economic growth by Pedroni (1999) cointegration analysis in Eurasian countries. In the next section of the study, panel studies about energy consumption and growth in the literature will be presented briefly. Econometric theory and methodology is identified in the third section. The fourth section consists of the empirical results while the last section includes conclusions and policy implications. This study can be defined as a complementary to the previous empirical papers. However, it differs from the existing literature for some aspects. First, the previous studies have generally used only one empirical method for discovering the relationship between electricity consumption and growth. Being distinguished from the literature, this study employs a broader range of empirical methods: it identifies the direction of the relationship by Granger causality; the cointegration relationship by both Pedroni tests; the magnitude of the relationship by both Fully Modified Ordinary Least Squares (FMOLS) estimation, structural breaks by Lee and Strazicich (2004) unit root tests. Second, studies in the previous literature analyzed the issue for a broader sample of countries, such as all developing countries: only some Former Soviet countries were included in their entire sample.

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