Understanding the relationship between Carbon Dioxide emission and economic growth in Sri Lanka: An empirical study

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Abstract

Impact of climate changes have been identified as a serious challenge for sustainable development at global level. It is well documented that, most of the global climate changes have been dominated by the artificial Carbon Dioxide (CO_2) emission. Most of artificial CO_2 emission results from the energy consumption and that energy is also a key element of economic growth. Following above relationship, ample studies have been carried out to explain the relationship between CO_2 emission and economic growth in developed countries. This study attempts to investigate the long run and short run relationship between CO_2 emission and economic growth in Sri Lanka. The data set comprised of annual time series data for Sri Lanka over the period 1960-2016. This study employed real GDP in Sri Lankan Rupees as a proxy for economic growth. CO_2 emission was measured in Kilo tons. LNCO2 denoted natural log of CO_2 emission while LNRGDP indicated natural log of real GDP. The ADF test rejected the null hypothesis of non stationary for both LNCO2 and LNRGDP at the first difference. The Johansen Co-integration Test was employed to test the long run relationship between LNCO2 and LNRGDP. The null hypothesis of no co-integrating relationship was rejected at the 5% probability level employing Trace statistic (trace statistic = 13.36647 > critical value = 12.32090 and p-value: 0.0333). The null hypothesis of no co-integration was rejected again at the 5% probability level employing Maximum Eigenvalue (max eigan statistics = 12.99901 > critical value 11.22480 and p-value: 0.0241). These results confirmed a long run relationship between variables. There is also a unidirectional causal relationship runs from CO_2 emission to real GDP in short run according to the results of Granger Causality Test. Therefore, this study confirms both short run and long run relationship between CO_2 emission and real GDP. This relationship has been identified in developed countries. Surprisingly, Sri Lanka, as a small and developing country still have the same relationship. With above findings it is clear that, reducing the CO_2 emission without hindering the economic growth is problematic. Occasionally, the reduction of CO_2 emission may accelerate the improvement of renewable energies and encourage the efficient usages of existing energy sources. Therefore, this study recommend an integrated programme for reducing CO_2 emission while developing the renewable sources.

Keywords: *Causality, Climate changes, Cointegration, GDP, Sri Lanka*

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