

# **The Impact of Economic Growth, FDI, Urban Population, Energy Consumption, and Renewable Energy Consumption on CO<sub>2</sub> Emissions: Evidence from China**

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The environmental problem that has been ascribed as a pressing world-wide concern that leads to global warming has been researched from many different angles to discern the underlying causes. Understanding the dynamic nexus between economic growth and carbon dioxide (CO<sub>2</sub>) emissions helps countries improve their economic growth and development while undertaking efforts to reduce carbon emissions through developing appropriate resources and formulating apposite policies. It was found that in large developing countries like China, the root cause for increased CO<sub>2</sub> emissions usually stem from the burning of fossil fuels, like coal and oil, for industrial and energy production from large-scale industries. China's economy that is heavily driven by their manufacturing industry has caused their energy-intensive heavy industry to use an abundance of coal. The industrial activity and structure coupled with its unsustainable energy mix and low efficiency of energy utilization have become important forces in soaring China's CO<sub>2</sub> emission, resulting 30% of the total global emissions in 2019, as well as securing the ranking as the largest CO<sub>2</sub> emitter in the world. The current study attempts to investigate the impact of economic growth on CO<sub>2</sub> emissions with additional variables such as foreign direct investment (FDI), urban population, energy consumption, and renewable energy consumption in China, employing the ordinary least squares (OLS) methodology for the period 1990 to 2014. Several diagnostic tests (normality test, multicollinearity, serial correlation, and heteroscedasticity test) were also carried out to estimate the results from the regression equation. The results revealed that FDI and energy consumption has a positive and significant impact on CO<sub>2</sub> emissions at 5% significance level and urban population has a positive and significant impact on CO<sub>2</sub> emissions at 10% significance level in the country. This indicates that an increase in FDI, energy consumption, or urban population will cause the CO<sub>2</sub> emissions in the country to rise as well. The influence of economic growth and renewable energy consumption however was found to not have a significant impact on CO<sub>2</sub> emissions in China. From this, it is vital for the government of China to implement policies that encourage FDI, energy consumption, and urban population without forsaking the environment. It is therefore recommended that a Carbon Tax be imposed to all local firms to incentivize the firms to reduce their carbon footprint and/or encourage the conversion to green technology. Aside from that, the government should also introduce technological improvement policies to encourage firms to consume less energy-intensive inputs in their machinery and decrease their reliance on fossil fuels to achieve their goals. On top of that, in order to control carbon emissions that occur due to an increase in urban population, effective planning for convenient urban infrastructure and layout should be implemented by the government in order to reduce dependencies on private motor vehicles and traffic congestion that contributes to higher CO<sub>2</sub> emissions.

**Keywords:** *CO<sub>2</sub> Emissions, Economic Growth, Energy Consumption, FDI, Ordinary Least Squares, Renewable Energy Consumption, Urban Population*