

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh Foreign Direct Investment (FDI), pertumbuhan ekonomi, ekspor, dan impor terhadap emisi karbon dioksida (CO₂) pada negara-negara G20 periode 2000-2022. Emisi CO₂ merupakan salah satu indikator utama kualitas lingkungan yang menjadi perhatian global karena kontribusinya terhadap pemanasan global dan perubahan iklim. Peningkatan aktivitas ekonomi, investasi asing, perdagangan internasional diduga memengaruhi tingkat emisi karbon di negara-negara G20 yang memiliki kontribusi besar terhadap perekonomian dan emisi global. Penelitian ini menggunakan data panel yang terdiri dari 19 negara anggota G20 selama periode 2000-2022. Data diperoleh dari World Development Indicators (WDI) yang dipublikasikan oleh World Bank. Variabel dependen dalam penelitian ini adalah emisi CO₂, sedangkan variabel independen meliputi Foreign Direct Investment (FDI), pertumbuhan ekonomi, ekspor, dan impor. Analisis data dilakukan menggunakan metode regresi data panel. Pemilihan model dilakukan melalui Uji Chow, Uji Hausman, dan Uji Lagrange Multiplier (LM). Berdasarkan hasil pengujian, model terbaik yang digunakan adalah Random Effect Model (REM). Untuk memperoleh estimasi yang lebih robust terhadap heteroskedastisitas dan autokorelasi, dilakukan koreksi menggunakan Cluster Robust Standard Error. Hasil penelitian menunjukkan bahwa impor berpengaruh positif dan signifikan terhadap emisi CO₂ pada negara-negara G20. Sementara itu, ekspor berpengaruh negatif dan signifikan terhadap emisi CO₂. Foreign Direct Investment (FDI) dan pertumbuhan ekonomi tidak berpengaruh signifikan terhadap emisi CO₂. Temuan ini mengindikasikan bahwa peningkatan aktivitas impor masih menjadi faktor yang mendorong peningkatan emisi karbon, sedangkan peningkatan ekspor berpotensi menurunkan emisi karbon melalui peningkatan efisiensi produksi dan penggunaan teknologi yang lebih baik.

Kata kunci: Emisi CO₂, Foreign Direct Investment (FDI), Pertumbuhan Ekonomi, Ekspor, Impor, G20

ABSTRACT

This study aims to analyze the effect of Foreign Direct Investment (FDI), economic growth, exports, and imports on carbon dioxide (CO₂) emissions in G20 countries during the period 2000-2022. CO₂ emissions are one of the main indicators of environmental quality and have become a global concern due to their contribution to global warming and climate change. Increasing economic activity, foreign investment, international trade are expected to influence carbon emission levels in G20 countries, which account for a significant share of the global economy and emissions. This study employs panel data consisting of 19 G20 member countries from 2000 to 2022. The data were obtained from the World Development Indicators (WDI) published by the World Bank. CO₂ emissions are used as the dependent variable, while Foreign Direct Investment (FDI), economic growth, exports, and imports are used as independent variables. The analysis was conducted using panel data regression. Model selection was performed through the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test. Based on the test results, the Random Effect Model (REM) was selected as the most appropriate model. To obtain more reliable estimates in the presence of heteroskedasticity and autocorrelation, Cluster Robust Standard Errors were employed. The results indicate that imports have a positive and significant effect on CO₂ emissions in G20 countries. Meanwhile, exports have a negative and significant effect on CO₂ emissions. Foreign Direct Investment (FDI) and economic growth do not have a significant effect on CO₂ emissions. These findings suggest that increasing imports remain important drivers of carbon emissions, while exports may contribute to reducing CO₂ emissions through improvements in production efficiency and the adoption of better technologies.

Keywords: *CO₂ Emissions, Foreign Direct Investment (FDI), Economic Growth, Exports, Imports, G20*