

Evidence of Environmental Kuznets Curve of ASEAN Plan of Action for Energy Cooperation

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Overview

Established in 1967, ASEAN is now comprised of 10 countries namely Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. The countries have varieties of background on their politics, economy, energy market and environmental policies. ASEAN has rebounded from economic crisis in 1998 with its GDP in 2020 of more than \$3 trillion. After the economic growth was hampered by pandemic, according to ADB, the regional countries is expected to grow about 5.1% in 2022. However, the need for economic growth and energy source may have environmental consequences. In November 19, 2020, through ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025, Phase II: 2021-2025, its member countries are committed to achieve 23% share of renewable energy by 2025 through its investment and the usage of new technology. The importance of ASEAN in supporting its economic growth and achieving objectives in reducing CO₂ emission is interested to be studied.

Studying relation between macroeconomic and CO₂ emission has been conducted by Utomo and Widodo (2019). However, they use the data before the enactment of Paris Agreement in 2015, therefore the governments of the ASEAN member countries may not be too concerned on the global environmental issue. Furthermore, the study did not investigate the differences on each of ASEAN member countries. Utomo and Widodo (2019) used Generalized Method of Moments (GMM), to analyze whether Environmental Kuznets Curve (EKC) explains the relation between economic growth and the increase of CO₂ emission for ASEAN member countries. The study used the data from 2007 and 2014 and used CO₂ emission at a certain period as the dependent variable. In this study, GMM is used to achieve consistent and accurate result for a dynamic-regression model by “eliminating endogeneity due to correlation between the error term and the independent variable”. The study concludes that ASEAN member countries do not use environmental-friendly technology for their energy needs. However, the study also concludes that EKC based on economics exists for ASEAN countries as a whole. Azwar (2019) studies EKC for Indonesia by using data between 1981 and 2016. He uses Autoregressive Distributed Lag (ARDL) co-Integration framework. The result of the study indicates that EKC does not exist. Another study conducted by Khan, Muhammad, et al (2020) investigated the policy implemented by Pakistan on energy consumption, CO₂ emission by using Auto-Regression distributed lag model.

Methods

The empirical results support a carbon emission’s Kuznets curve hypothesis for ASEAN. Using an up-to-date panel dataset that covers ten ASEAN (Association of Southeast Asian Nations) member countries over a 31-year period (1990 - 2020), this paper revisits the Environmental Kuznets Curve (EKC) to measure environmental degradation in relation to GDP per capita.

Different from the previous studies, our study aims to investigate the relationship of economic development, measured as economic growth, energy use, trade and foreign direct investment towards environmental degradation, or in this study, CO₂ emissions. Many studies have attempted to prove the EKC phenomenon, but few aimed to look beyond the impact of foreign direct (FDI) and its contribution to the economic growth and environmental degradation. This research aims to fill the gap of the literature.

Results

We use regression analysis to study our preliminary result whether a country’s economic and environmental relationship follows EKC. After running different cases of analysis, our empirical results suggests that the majority of ASEAN countries follow EKC’s behavior, such as Brunei, Malaysia, Myanmar, the Phillipines, Singapore, Thailand

and Vietnam. While others, such as Indonesia, Cambodia, and Laos suggest positive relation between CO₂ emission and economic growth. There is a need for further investigation and analysis underlying the theoretical result. Empirical results also indicate that as an ASEAN region, the economic and environmental relations also follows EKC, just as the majority of its members.

In addition, the study proves a negative effect of foreign direct investment on CO₂ in the ASEAN region. Hence, there is a possibility that FDI is not targeted to reduce CO₂ emissions. This suggests that there is a significant need of to transition into clean energy through strong regional political support, as well as policies necessary to improve and attract investment on clean energy. Without such political support, the region will not achieve the target set at APAEC.

Conclusions

The results of this study shows that economic variable of some countries of ASEAN member countries have a significant impact on CO₂ pollution levels. In addition, the study proves a negative effect of foreign direct investment (FDI) on CO₂ emissions in ASEAN countries. This study recommends that carbon emission reduction policies in the ASEAN countries should focus more to easier access to environmentally friendly technology from developed countries to balance the trade-offs between the economy and environment. This study also provides policy recommendation for ASEAN on how to achieve net zero emission without sacrificing the economic growth. Collaboration is required among ASEAN members to assure economic growth and minimizing carbon emission.

References

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