***Non-Linear Effects of Fiscal Spending on Environment Quality: New Evidence from a Threshold Analysis***

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Overview

This paper investigates the effect of fiscal spending on the environment quality at the aggregate and disaggregate level for a sample of 128 countries during 2005-2019. We employ Dynamic Panel Threshold regression to examine whether the effect of fiscal expenditure on carbon dioxide emissions is monotonic with the level of economic development or whether there is an economic development threshold over which the effect shows up or ceases to exist. We further analyse whether the threshold effect varies across some key sectors of the economy. The empirical findings are robust to alternative model specifications and have significant implications for countries looking forward to resource allocation revisions as part of green budget tagging of their fiscal expenditure.

Methods

The modelling technique that has been used in the literature (Halkos & Paizanos, 2013, 2017) to incorporate the aforementioned non-linear behaviour in the relationship between fiscal expenditure and environment quality is mostly based on including a parametric functional term for GDP in the model specification. One important limitation of using a parametric functional form for GDP is that estimated regression parameters may not be uniform across all the countries if a country's GDP level influences how fiscal expenditure affects environmental quality. Additionally, compared to positive ranges, the relationship's negative ranges may have a different absolute influence. In this paper, by adopting a dynamic panel threshold regression approach (Kremer et al., 2013), we try to overcome the above problems. The model helps in predicting how the degree of influence may vary across different groups that have been endogenously categorised in the case when some spending head may affect the environment at all stages of economic development.

Results

Our results suggest that lowering total fiscal spending in all countries leads to increased carbon dioxide emissions, but the effect is greater for low-income countries with a per capita GDP of less than 981$. Additionally, lowering spending on manufacturing & allied activities and on the transportation, could improve the environmental quality but only for relatively developed countries having per capita GDP above 1345$ and 1818$ respectively. In countries with per capita GDP less than $2295, more health spending is increasing the environmental burden. This is possibly as a result of the budgetary constraints that such low-income nations face, which may cause healthcare spending to rise at the expense of other spending including environment spending. Lastly, education expenditure is found to increase emissions only modestly.

Conclusion

Environment is considered as a luxury good in most low-income countries where the government priority is to boost economic growth. Even when these countries might not prioritize environment quality, our results portray that their spending decisions have substantial effects on their carbon emissions. Depending upon their GDP levels with reference to the threshold, countries can accordingly make resource allocation revisions in these four sectors as part of their green budget tagging process. This is more important as all the sectors used in our analysis have shown significant detrimental effects on the environment for a particular group of countries. Till very recently, tagging systems did not take into account costs associated with actions that had a negative influence on climate outcomes. They mainly used to include those budgetary actions that were beneficial for the environment. In the tagging process used for its 2021 budget, France is the first country to systematically flag expenses that are hazardous to the environment (World Bank, 2021). Moreover, the groups for which harmful effect of expenditures are insignificant can be prospective avenues to identify projects for sovereign green bond issuance.