[GOVERNANCE AND CLIMATE FINANCE IN THE DEVELOPING WORLD]

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Overview

We investigate the relationship between governance and climate finance, particularly in the context of the energy transition in developing countries. Our aim is to examine how governance qualities in developing countries impact financial contributions from contributor countries that intend to fund mitigation projects in the energy sector. We have compiled a dataset of yearly climate finance contributions at the project level spanning from 2011 to 2019. Our analysis, which utilizes random forests and LASSO estimations, reveals that climate finance contributions, particularly those for energy-related projects, are significantly linked to good governance, including a robust legal system, rule of law, and accountability. Ultimately, this study provides valuable insights into the dynamics between governance and climate finance in developing countries and informs policy decisions to support effective climate action in the energy sector.

Methods

We use machine learning methods on the data set for climate finance funds during the period 2011-2019 at the project level to evaluate how developing countries' governance qualities impact developed countries' financial contributions. So, we study the determinants of funding contribution for climate change projects, particularly for energy-related ones.

In detail, we construct a dataset on global climate finance, governance, various indicators for energy, the environment, and the economy, and various indicators for financial and economic risks from various sources including UNFCCC Climate Finance Data Portal, 2023, IMF, 2023 , The World Bank, 2023, Global Environment Facility, 2023, Food and Agriculture Organization, 2023, Kaufmann and Kraay, 2023, The PRS Group, 2023, and Climate Watch, 2023. The dataset consists of various determinants for funding contribution for a climate change project given in US dollars, which we classified into governance indicators, energy and environment related indicators, Economic risks indicators and socioeconomic factors. We use the constructed panel dataset to estimate the climate funding decisions on climate change projects in recipient countries, particularly for the projects in the energy sector. To take advantage of the different source of variation and control for potential unobserved factors we include all variable interactions which leave us with a high-dimensional regression problem with 2714 variables. We use Machine Learning methods for our estimation.

Particularly, to robustly perform variable selection, we estimate the bootstrapped cross-validation (CV) LASSO (Least Absolute Shrinkage and Selection Operator) regression model. LASSO can help control for overfitting and provide a more parsimonious model, especially when the model has high-dimensional controls. We also estimate the bootstrapped Random Forests model to determine the variables that are more important than others. This combination is beneficial because the Random Forest may capture complex interactions and non-linear relationships between the financial contributions and each of the variables in the vectors Governance, EnergyEnvironment, SocioeconomicFactors, and EconomicRisks that the LASSO can miss.

Results

We find that governance, energy, and the environment factors in developing countries determine the size of funding contribution for their climate finance projects in their countries, particularly for energy-related projects. A higher quality of governance allows for greater economic stability and predictability, which favors investment flows. Developing countries need to work more to improve their governance, but bigger efforts need to be done considering the rapid climate change. This includes to urgently improve climate finance access, by simplifying and standardizing administrative processes, and providing with capacity building support and higher participation of local stakeholders in the decision of climate change projects. It is also crucial to have more clarity between climate finance and development aid. They should not be treated as same, as the incentives for those two funding aids are not equivalent.

Conclusions

We study the determinants of funding contribution for climate change projects, particularly for energy-related ones. We find that various factors in governance, economy, energy, and the environment in developing countries determine the size of funding contribution for the energy projects in their countries.

The results of our study imply that governance quality can shape the feasibility of energy projects in the developing world. Although it is capable for the government to implement energy policies, the low quality of governance can slow down financing energy projects in developing countries. The results of our study also confirm that it is important for recipient countries to understand the microeconomic mechanism of financing energy projects through various factors in energy markets, macroeconomic conditions, and the environment in their local setting.

The results have policy implications for both contributors' and recipients' climate change projects and funding decisions. First, recipient countries with improved governance quality can raise higher climate funds with regards to energy projects. In particular, strong legal systems, rule of law, and accountability arise as the most influential governance factors. For example, recipient countries can shape step-by-step in those details to implement energy projects that tend to require an enormous amount of funding from contributors. This would help convince contributors to invest in their energy projects.

We leave several important questions that are worth to be investigated in future research. First, we do not consider the effectiveness of climate finance on mitigating GHG emissions in the energy sector through benefit-cost analysis. Although there would be the positive association between the size of funding contribution and the amount of GHG emissions reduction, it is empirically challenging to evaluate the welfare implication of climate finance. This task may require more details in data with regards to how much an emission reduction a specific energy project realizes. Post-evaluation of the energy project should help these tasks. Second, we do not model the strategic interaction between the contributor and the recipient. For example, contributors can use contribution as a strategic instrument to influence other activities that involve both parties. This type of strategic behaviors with regards to climate finance may play an important role in transitioning into low-carbon economy in the developing world.

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[Full list of references is available in the paper.]