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The United States Agency for International Development and forest loss: A cross-national analysis of environmental aid

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Abstract

Among scholars of international development, there is a debate regarding the effectiveness of bilateral aid to improve the natural environment. Here we focus on evaluating whether United States Agency for International Development's (USAID) aid in the environmental sector reduces forest loss. Little empirical evidence exists on this question, partly because of the challenge of modeling such a relationship, given the problem of endogeneity whereby the same social, political, or economic processes that affect forest loss may also be correlated with a nation receiving aid from international donors. We contribute to this debate by utilizing a two-stage instrumental variable regression model to analyze cross-national data for a sample of 74 low and middle income nations. After controlling for potential endogeneity, we find that higher levels of USAID's aid for environmental protection correspond with lower rates of forest loss. We

also find that a forest's proximity to infrastructure, agricultural and forestry exports, agricultural land area, and tropical climate are related to increased forest loss.

Keywords:

Forest loss | United States Agency for International Development | Cross-national | Environmental protection

Notes

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1 We analyze forest loss in low and middle income nations as classified by World Bank (2016) because high income nations are not eligible for aid from USAID. They include: Albania, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, China, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Ethiopia, Gabon, Georgia, Ghana, Guatemala, Guinea, Guyana, Honduras, Hungary, India, Indonesia, Jamaica, Kazakhstan, Kenya, Kyrgyz Republic, Lesotho, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mexico, Moldova, Mongolia, Mozambique, Namibia, Nepal, Nicaragua, Nigeria, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Senegal, South Africa, Sri Lanka, Sudan, Suriname, Tajikistan, Tanzania, Thailand, Togo, Turkmenistan, Uganda, Ukraine, Venezuela, Vietnam, Zambia, and Zimbabwe.

2 We tried the circular distance from Washington D.C. to each nation's capital as an instrument. It violated the valid instrument assumption. The diagnostic statistics also indicated it was a weak instrument.

3 We replicate the models using a limited information maximum likelihood estimator, which often performs better with small samples (Baum, 2006). The results are similar to the findings presented.

4 We test other variables as instruments in the first stage of the models. They include internal conflict, land area, foreign direct investment, domestic investment, and other regions of the world. They do not perform well as instruments based on diagnostics discussed.

5 Following Hermanrud and de Soysa (2017) and Bare et al. (2015), we include interaction terms to determine if the effect of USAID aid varies at different levels of corruption. The coefficients for the interaction term do not reach a level of significance.

6 We included percentage of protected forest area in the models. The coefficients do not reach a level of statistical significance.

7 We include dummy variables for the region of the world in the forest loss models. The results are similar.

8 We included the total amount of forest area within a nation as a control in the models. The coefficients do not reach a level of statistical significance.

9 We included the non-dependent population growth rate with the total population growth rate. The coefficients for both variables fail to reach a level of statistical significance. This is most likely the case because of the high bivariate correlation between the variables. We repeat this for the rural and urban population growth models. The results are similar to the findings reported.

10 We included the percentage of forest area owned by the government. It may well be that higher amounts of public forest area may correspond with increased forest loss because it can be obtained cheaply via lease or theft for extractive activities. The data come from the United Nations Global Forest Resources Assessment (2010). The coefficients do not reach a level of statistical significance. It important to note that including this variable reduces our sample size to 58 nations.

11 We replicated the models including a square of gross domestic product per capita to test for the presence of an inverted, u-shaped relationship with forest loss. The coefficients for the squared term do not reach a level of statistical significance.

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