

SUMMARY FOR DECISION MAKERS

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Environmental investments and income: A municipal perspective

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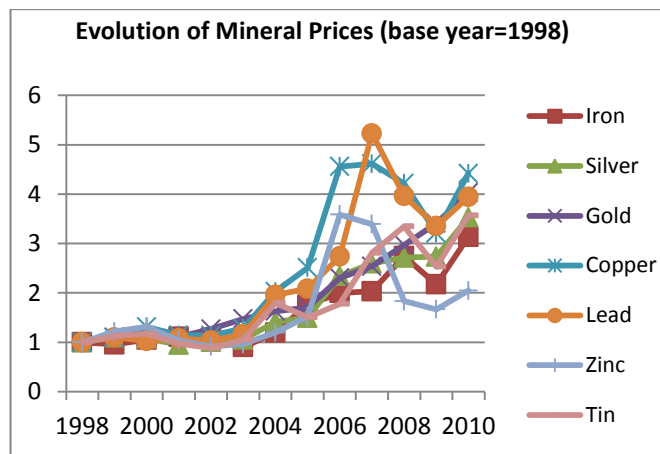


In the coming decades, most of the growth in energy demand, fossil fuel use and greenhouse gas emissions will come from developing countries (Wolfram, Shelef and Gertler 2012, EIA 2010, OECD 2008). The environmental economics literature has studied the relationship between economic development and pollution, particularly the existence of an inversed U-shaped relationship between ambient pollution levels and GDP per capita. The empirical support for the existence of this curve is mixed, and varies based on the estimation technique used, the type of pollutant and income level. In this paper, I undertake a within- country analysis, investigating the relationship between an increase in Peruvian municipal income and a variety of environmental investments.

From 2005 to 2010, Peru experienced an average growth in GDP of 6% per year, coupled with several years of high international mineral prices. During the

same period, Peruvian municipalities almost doubled their total net income (total deflated income, minus debt and any balance from the previous year). Despite this increase in municipal income, in 2010, only 35% of municipalities treated their water, 11% of municipalities did not collect their waste, and 55% of municipalities used an open dump for waste disposal. Given the paradox of increasing municipal income and low environmental investments, this paper seeks to shed light on the following questions: does an increase in municipal income alone lead to additional environmental investments? If so, what is the nature and speed of these investments? Finally, on which non-environmental areas are municipalities spending their additional revenues? The main purpose of this paper is to quantify the impact of an increase in municipal income on environmental investments by municipalities in Peru. To investigate this issue empirically, I match municipal income, mining-based transfers (royalties) and

environmental investments by municipality and year. Using exogenous variation in mineral prices to instrument for mining-based transfers and municipal income, I test whether an increase in income leads to greater environmental investments in areas such as green spaces, waste treatment, environmental management, waste collection and programs that incentivize environmental protection during 2004-2010. I allow for a maximum lag-time of three years and control for year and municipal fixed effects.



I use publicly available data on all mining transfers from the central government to local municipal governments for the universe of municipalities in Peru from 2001 to 2010, merged with a municipal survey (RENAMU). The survey includes a detailed panel of (self-reported) municipal data, with at least 96% of the municipalities reporting data every year and with data improving over time. I use data on income and investments (environmental and non-environmental) from 2004 to 2010, and include additional data on mineral prices and mineral “production”.

First, I show that on average, mining prices do indeed increase mining transfers, which, in turn, increase municipal income (i.e. revenue from mining transfers are not crowding out other revenues). Second, allowing a maximum lag-time of three years, I find evidence of positive and significant effects: municipalities invest more in green spaces, water treatments, municipal

waste plans, and more frequent waste collection. Third, although there are positive, significant effects on certain environmental investments, the magnitude of these effects is relatively small given the large increases in municipal income. Fourth, I find that increases in municipal income lead to non-environmental municipal investments in areas such as health, education and transportation. Finally, the results suggest that municipalities face significant trade-offs between environmental and non-environmental investments.

These results should be interpreted in light of the time period, data and identification strategy used, as a few caveats are in place. First, testing is limited to measurable and reported outcomes. Second, although many of the tested outcomes are relatively fast-reacting, some investments may require further time lags in order to be undertaken and subsequently reported. Third, municipal governments may be constrained by the availability of larger amounts of funding or by administrative divisions of responsibilities between the central and local governments.

While municipalities are forced to make trade-offs between environmental and non-environmental investments, the results found in this paper suggest that large increases in income alone do not seem to lead to significant additional environmental investments. In this context, further environmental investments can be encouraged through direct policies such as minimum standards, tax incentives or information campaigns.

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