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Women gather to receive contraceptives in Malawi

Avoiding Trade-Offs: Can population policies promote environmental protection and alleviate poverty?

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Introduction

Climate change has the potential to cause significant harm to people and the planet (Stern, 2007; Weitzman, 2007; Tol, 2011). Thus, a great deal of attention has been devoted to devising mitigation policies, such as carbon taxes, cap-and-trade schemes, and energy efficiency mandates. These policies have economic costs and environmental benefits. As a result, when economists try to calculate optimal climate change mitigation policy, they must weigh these costs and benefits (Nordhaus, 2013; Golosov *et al.*, 2014). **But what if there are policies for which there is no trade-off between economic and environmental priorities?** Such policies could alleviate poverty and improve living standards while still providing much needed environmental protection.

We recently published a paper in [Environmental Research Letters](#), [“Is faster economic growth compatible with reductions in carbon emissions? The role of diminished population growth,”](#) that demonstrates the potential for slower population growth to simultaneously increase

income per capita and lower carbon emissions (Casey and Galor, 2017). Population growth is a major driver of carbon emissions, both historically and in projections of future emissions (Raupach *et al.*, 2007). Yet, relatively little attention has been devoted to investigating the potential for population policies to influence global climate change (O'Neill *et al.*, 2012). By population policies, we refer to policies that affect population growth via voluntary decisions made by individuals. Indeed, the entire reason to prefer policies that achieve both economic and environmental priorities is to improve the lives of individuals as they value them.

Our Findings

Decreases in population also decrease overall economic activity, leading to less carbon emissions. At the same time, there are many mechanisms through which decreases in population growth – especially when driven by fertility – increase output per person. Thus, decreases in population growth have two offsetting effects on carbon emissions: the direct decrease in economic activity and the increase in economic activity per person.

Our [paper](#) measures the overall effect of decreases in population growth on carbon emissions in a two-step process. First, we use cross-country data to estimate the elasticity of carbon emissions with respect to population and income per capita. Consistent with existing literature, we find that the elasticity with respect to population is nearly seven times larger. Thus, decreases in population growth could decrease overall emissions while still substantially increasing income per capita. The remaining step is to estimate the impact of lower population growth on income per capita. To do so, we focus on the example of Nigeria and use a recently constructed economic-demographic model to estimate the effect of lower fertility on economic outcomes (Ashraf *et al.*, 2013). We find that reductions in fertility can simultaneously lead to a 15% increase in income per capita and a 35% decrease in carbon emissions by 2100 C.E.

Thus, our analysis demonstrates the potential for decreases in population growth – via decreases in fertility – to simultaneously achieve economic and environmental policy priorities, circumventing a trade-off central to most climate change mitigation policies. Our analysis demonstrates the potential for these outcomes, without providing estimates of effects on a global scale or in response to specific policies. We hope that future work will extend our analysis in these directions.

Policy Implications

Our results have important implications for climate change policy. There are two reasons why population-based approaches may garner more political support than more conventional policy options. First, the principle of differentiated responsibility is widely accepted in the

international community, and population policies have the potential to let high-fertility, low-income countries decrease emissions without imposing an undue burden on poverty alleviation and economic prosperity (Bruneo and Strick, 2013). Moreover, by eliminating the trade-off between environmental and economic outcomes, population-based policies may be able to overcome free-rider effects that hamper efforts to address problems that are global or international in nature (Stavins, 2011).

Our research abstracts from the specifics of population-based policies and focuses instead on an exogenous reduction in fertility, but considering specific policies is obviously an important component to future work. There are several policies that may lead to lower fertility, the most obvious of which is the provision of contraceptives. Evidence suggests that there is a significant unmet demand for contraceptives in developing countries (Gillepsie *et al.*, 2013). Moreover, a recent study for the Copenhagen Consensus Project suggests that policies targeting fertility via contraception have high returns (Kohler and Berman, 2014). [Our earlier paper](#) on the subject provides a broader discussion of the types of policies that could affect fertility in both developing and developed countries, focusing on the economic factors that alter individuals' incentives (Galor and Casey, 2014). As with all decisions, parents have limited resources to allocate to raising children, and as a result, many economic policies will influence fertility rates. In particular, parents must decide how to allocate resources between having more children and investing in the future of each child. There is considerable evidence for this 'quantity-quality trade-off' in the economics literature (Guinnane, 2011; Galor, 2012). Thus, policies that increase incentives for investment in education, for example, can also lead to lower fertility levels. Such policies could include targeted interventions, such as subsidies for education, or broader macroeconomic interventions, such as increases in the potential for high-skill migration or subsidizing industries that demand skills from local workers (Galor and Mountford, 2008; Wheeler and Hammer, 2010; Docquier and Rapoport, 2012).

Conclusion

Most policies aimed at mitigating global climate change face a trade-off between economic and environmental outcomes. By contrast, our recent paper provides evidence that population-based policies may have the ability to simultaneously increase income per capita and lower carbon emissions. This suggests that these policies could play an important role in the global response to climate change. They may also receive increased political support by lessening challenges of international burden sharing and free-rider concerns.

The MAHB Blog is a venture of the Millennium Alliance for Humanity and the Biosphere.
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