PROPOSAL: SOCIAL AND ECONOMIC IMPACTS OF ELECTRICITY PROVISION IN BRAZIL

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A fundamental role of governments in developing countries is to provide public services such as health, education and infrastructure for its citizens. Limited budgets often force policy-makers to choose between allocating the extra dollar of public funds to health or education programs, to build roads, or to extend electricity coverage. It is therefore important for social scientists to inform policy-makers about the returns to each type of public investment, so that money is spent effectively to stimulate economic growth. Our knowledge about the returns to many health and education initiatives is relatively well developed due to the proliferation of randomized experiments to measure the effectiveness of say, increasing teacher's salaries or distributing medicines. In contrast, designing randomized experiments for infrastructure projects (such as building electricity grids) is beyond researchers' capabilities, which in turn has limited our understanding of the true impacts of such projects. A major problem is that areas with electricity are fundamentally different from areas without access, and cross-sectional comparisons across the two areas are not valid.

This project will take advantage of the idea that even though electricity is not randomly allocated, households' access to electricity in a country that relies heavily on hydro-power may be somewhat random because it would depend on their proximity to rivers with a gradient suitable for hydro-electricity generation. Geography (river gradient, in particular) thus creates some 'natural' variation in the source points for electricity across Brazil. Drawing on these insights, we plan to examine the statistical impact of electricity access on socio-economic outcomes using only the portion of variation in access attributable to geography.

My plan is to have the undergraduate student help with and/or learn about one or more the following components of the project:

1. Proper 'policy evaluation' in this difficult setting by making use of econometric techniques such as 'instrumental variables' estimation.
2. Managing databases and conducting statistical analysis using STATA. A Ph.D. student working on the project will help the undergrad student get started on the syntax.
3. Constructing a historical database of the phased expansion of the electricity grid in Brazil. Some knowledge of Portuguese, or a related language (Spanish or French) would be helpful for this.
4. Should the student have any background or interest in engineering or mathematical modeling, then s/he could help design an engineering model of electricity grid expansion for Brazil.