

Fertility, child health, and the diffusion of electricity into the home*

Joshua Lewis[†]

Department of Economics,
University of Toronto

October 2, 2012

*I thank my advisors Dwayne Benjamin, Rob McMillan, Aloysius Siow, and Mark Stabile for their guidance and support. I am also grateful to Stephania Albanesi, Martha Bailey, Andrew Bird, Gustavo Bobonis, Branko Boskovic, Leah Brooks, Victor Couture, Shari Eli, Claudia Goldin, Gillian Hamilton, Sacha Kapoor, Kory Kroft, Frank Lewis, Hugh Macartney, Valerie Ramey, Matthew Turner, as well as seminar participants at the University of Toronto, the 2011 CEA annual meetings, and the 2012 Rimini Conference in Economics and Finance for valuable comments and suggestions. Martha Bailey and William Collins generously provided data on appliance ownership and electrical services. Financial support from SSHRC and the Royal Bank Graduate Fellowship in Public and Economic Policy is gratefully acknowledged. All omissions and errors are my own.

[†]Contact: 150 St. George Street, Toronto, Ontario M5S 3G7, Canada. Email: joshua.lewis@utoronto.ca.

Abstract

This paper studies how access to electricity and labour-saving household appliances affected fertility and child quality between 1930 and 1960 in the US. In the baseline models, I estimate the relation between changes in the proportion of households with electricity or modern appliances to changes in fertility rates, school attendance, and infant mortality. The fact that the decision to purchase a modern appliance may have been correlated with unobservable family characteristics creates a challenging identification problem, which I address using a new dataset that provides information on the construction of over 1600 new power plants between 1930 and 1960. Identification relies on plausibly exogenous changes in the cost of supplying power to different communities based on their location. I find that modern household technologies led families to make a quantity-quality tradeoff in terms of children: modern appliances were associated with increases in early school attendance, decreases in infant mortality, and declines in fertility. The declines in infant mortality were particularly large in states that relied heavily on coal for heating and cooking, consistent with modern stoves directly reducing indoor air pollution. Meanwhile, health improvements were larger in states that had previously invested heavily in maternal education programs, suggesting that household modernization also led parents to provide better infant care. Further, the results do not appear to have been driven by local economic development or changes in the quality of local health care. The diffusion of electricity into the home can account for between 25% and 35% of the total decline in infant mortality throughout this period. These results have implications for current policy, given that over 1.6 billion people worldwide still do not have access to electricity. This study suggests there is considerable scope for new off-grid electrification programs to improve child health and education.