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## CONTACT DETAILS

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## EDUCATION

*PhD Candidate*, Economics, University College London
Thesis title: "Household Demand in the presence of Externalities: Model and Applications"
Completion: April 2017

MRes Economics, University College London, 2011
MSc Economics (*Distinction*), University College London, 2010
BA(Hons) Economics (*Distinction*), University of Delhi, 2008

## REFERENCES

**ORAZIO ATTANASIO** (Advisor)
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## RESEARCH FIELDS

Development Economics, Applied Microeconometrics, Public Economics

## RESEARCH PAPERS

### Household (Under) Adoption of Sanitation: Externalities and Borrowing Constraints (JOB MARKET PAPER)

This paper analyses under-adoption of sanitation and the effectiveness of loans and price subsidy policies to increase coverage in the developing world. Under-adoption may be the result of externalities and borrowing constraints: while sanitation is an expensive investment for many poor potentially liquidity constrained households, it also generates positive health externalities. To investigate the impact of the two policies on sanitation coverage I estimate a dynamic model of household demand on a unique dataset from rural India. The model embeds both sources of market failure in order to compute equilibrium adoption levels under the loan and the subsidy policy. Using simulations from the estimated model, I study optimal policy design in an equilibrium setting with potential multiple equilibria. Counterfactual analysis reveals that existing sanitation levels are on average 53% below the social optimum, implying under-adoption. I find price subsidies to be more cost effective at increasing sanitation coverage. However, the policy impacts are heterogeneous by coverage levels: in villages with low coverage loans are equally, if not marginally more, effective. A price subsidy has a high social rate of return where externalities account for a substantial fraction of the policy impact. While a sanitation loan generates smaller social returns it is also cost efficient under targeted delivery.

### Quantifying Welfare effects in the presence of Externalities: An Ex-Ante Evaluation of a Sanitation Intervention

This paper analyses the impact of externalities on household demand for a preventive healthcare good and the subsequent welfare effects generated from a subsidy program towards its provision. An interesting feature of such goods is that the take-up generates externalities where the privately chosen adoption level differs from what is socially optimal. Using a unique dataset on sanitation take-up from rural India, I estimate a static demand model keeping into account the interdependence of household decision making within the village. A two-step estimation method is implemented to circumvent the computational burden associated with estimating a model with multiple equilibria. To evaluate the impact of subsidy interventions, I formulate analytical expressions to quantify substitution and income effects in the presence of externalities. Using this tool to further separate out the direct and indirect effects under different policy simulations, I find that substitution effects are significantly larger than income effects, and a substantial amount of this price effect is propagated through the indirect channel. The presence of positive externalities implies a larger welfare gain, while the Deadweight loss generated from the subsidy intervention is realised as a Net-Gain, as the society shifts towards a socially optimal level of adoption.

### Two–step Conditional Choice Probability Estimators with Measurement Error

This paper develops a correction method for existing Two-step CCP methods to estimate static and dynamic discrete choice models of incomplete information. Under the assumption that the observed data is generated by one of the possible equilibria, two-step estimators avoid the computational burden associated with repeatedly solving the fixed point for each candidate vector of parameters. However, to obtain consistent choice probability estimates in the first stage, two-step estimators rely on being able to observe the entire vector of states and actions in the data. This data limitation can be treated as a contamination of the variable of interest with measurement error. Using insights from small variance approximation to probability distributions, I extend the error correction method proposed by Chesher (1991) to the estimation of simple static interaction models. The method is applied to estimate Brock & Durlauf's (2001) interaction model which has been the cornerstone in the study of peer effects in recent literature. Monte Carlo simulations are conducted to approximate the magnitude of the impact of error in data and the resulting bias in parameter estimates.

## TEACHING EXPERIENCE

Fall 2014, 2013, 2012: Public Economics in Developing Countries, Lucie Gadenne, UCL
Fall 2014, 2013: Statistical Methods in Economics, Adam Rosen, UCL
Spring 2013: Microeconomics, Ian Preston & Martin Cripps, UCL

## RESEARCH EXPERIENCE

Spring 2014: Research Assistant to Elena Pastorino & Orazio Attanasio
Nov 2011 - Jun 2013: Research Assistant to Orazio Attanasio, ERC Grant
Nov 2012 - Jan 2013: World Bank, STC Research Assistant, Water & Sanitation AFRICA
Oct 2010 - Sept 2011: Institute for Fiscal Studies U.K., Researcher on FINISH:Water & Sanitation project

## SEMINAR PRESENTATIONS

2017: RES Conference at Bristol, University of Southern California, Washington University in St Louis, Universidad Carlos III Madrid, KU Leuven, Tilburg University, Sciences Po, Toulouse School of Economics, INSEAD, University of Essex, University of Bristol, University of Toronto
2016: UCL, EEA-ESEM Geneva, EDePo Institute for Fiscal Studies, Econometric Society European Winter Meetings (Edinburgh)
2015: UCL, Collegio Carlo Alberto, Turin
2014: University of Mannheim, ENTER Jamboree Stockholm, UCL

## SCHOLARSHIPS AND AWARDS

2015-16 W.M. Gorman Scholarship, University College London
2013-15 David Pearce Scholarship, University College London
2010-11 W.M. Gorman Scholarship, University College London

2014 Excellence in Teaching Award, University College London

## REFEREE EXPERIENCE

*Economic Journal*

## SKILLS

Computing: Julia, R, Matlab, Stata
Language: English (native), Hindi (native), French (basic)