

**SANGHMITRA GAUTAM**

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## WASHINGTON UNIVERSITY IN ST LOUIS

### CONTACT DETAILS

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Department of Economics  
Washington University in St Louis  
One Brookings Dr  
307 Seigle Hall  
St Louis 63130 USA

### EMPLOYMENT

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*Assistant Professor*, Washington University St Louis, 2017

### EDUCATION

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

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

### REFERENCES

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**ORAZIO ATTANASIO** (Advisor)  
Professor  
Department of Economics  
University College London  
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### RESEARCH FIELDS

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Development Economics, Applied Microeconometrics, Public Economics

### **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

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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

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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

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2017: OXDEV 2017, Implementation of Structural Dynamic Models UCL, 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

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2017-18 Weidenbaum Center Small Grant, Washington University  
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

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Economic Journal, Journal of Demographic Economics

## SKILLS

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