Updated September 23, 2019

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Education

Ph.D. Candidate, Economics, Temple University, 2018- (*Expected*: May 2020)

Dissertation: "Estimating R&D Interaction Structures and Spillover Effects"

Committee: Brantly Callaway (Chair), Oleg Rytchkov, Charles Swanson

Ph.D. Student, Economics, Temple University, 2014-

B.A., Economics and French (First Class), University of Ghana, Legon, 2013

Research Interests

Microeconometrics and Empirical Industrial Organisation

Research Skills

Bayesian Econometrics, Machine Learning, Statistical programming

Working Papers

1. R&D spillover effects on firm innovation - A spatial approach (Job Market Paper - Preliminary version available on request)

   Abstract: Quantifying R&D spillover effects requires a spatial matrix that characterises the strength of connectivity between firms. In practice, the spatial matrix is often unknown. This paper proposes a parsimonious approach to estimating the spatial matrix alongside parameters and quantifies R&D spillovers on innovation. The approach generalises to a class of linear and non-linear models and allows asymmetry and time-variation in the spatial matrix. On firm innovation, we find positive spillover and private effects of R&D on innovation. We confirm time-variation and asymmetry

in the interaction structure of firms and find that geographic and product market proximity are relevant. Moreover, the strength of connectivity between firms is not limited to often-assumed notions of closeness.

2. Clustered covariate regression [SSRN], (with Abdul-Nasah Soale, under review) - *Scheduled for presentation at the Mid-West Econometrics Group Conference, October 2019*

   Abstract: This paper introduces an estimator for a general class of models under rank deficiency arising from high dimensionality, multicollinearity, or both. Our approach obtains a projection matrix that projects a high-dimensional (potentially growing $p >> n$) parameter vector into a reduced consistently estimable one. We show consistency and asymptotic normality of the estimator. Recovering the high-dimensional parameter vector using the projection matrix leaves precision unaffected. We employ a sequential estimation algorithm that, at once, obtains parameter estimates and the projection matrix. Our Monte Carlo simulations demonstrate a high approximative ability of high-dimensional parameters, improved precision, and reduced bias even under multicollinearity. In our empirical application, we find that firms on average generate positive R&D spillovers on firm productivity though these are dominated by private returns to R&D.

3. Bayesian Distribution Regression [SSRN], (with Weige Huang)

   Abstract: This paper introduces a Bayesian version of distribution regression that enables inference on estimated distributions, quantiles, distributional effects, among other functionals of interest. Our estimators come in three categories: the non-asymptotic, semi-asymptotic, and asymptotic. To conduct simultaneous inference on a function of any estimator, we introduce asymmetric and symmetric Bayesian confidence bands. Inference on point estimates is conducted via posterior intervals. The Bayesian asymptotic theory we develop extends the foregoing to gains in computational time and tractability of posterior distributions. Monte Carlo simulations conducted illustrate good performance of our estimators. We apply our estimators to evaluate the impact of institutional ownership on firm innovation.

4. Recovering distributions for the estimation of treatment effects under partly unobserved treatment with repeated cross-sections [SSRN]

   Abstract: This paper develops an approach to estimating quantile treatment effects among other distribution-based measures of treatment effects when treatment status is unobserved in some periods by using a maximum likelihood-based finite mixture approach that combines the multinoulli and the asymmetric Laplace distributions (ALD). We show that by treating the unobserved treatment status as latent and using the Expectation-Maximisation algorithm to recover unobserved treatment statuses and distributions, employing quantile differences-indifferences (QDID), changes-in-changes (CIC) among other estimators of treatment effects is straightforward. To evaluate the small sample performance of our model, we employ Monte Carlo simulations and find that the model generally outperforms naive ones that substitute available proxies for unobserved treatment.

Work in Progress

1. Unobserved heterogeneity in two-part models (with Brantly Callaway)
2. A parsimonious approach to estimating the SAR spatial matrix from panel data

Conferences

2019: Presenter (scheduled), Mid-West Econometrics Group Conference

Teaching

1. Temple University

   Instructor, Principles of Macroeconomics, Fall 2018, Spring 2019, Fall 2019
   Instructor, Principles of Microeconomics, Summer I (2015 & 2016), Fall 2017
   Instructor, Intermediate Microeconomics, Summer I, 2018
   Teaching Assistant for Prof. Michael Bonnano, Fall 2014 - Spring 2016
   Teaching Assistant for Prof. Michael Leeds, Fall 2016 - Spring 2017

2. University of Ghana, Legon

   Teaching Assistant for Dr. Abel Fumey, 2013-2014

Software

R packages: `bayesdistreg` [CRAN] [Website] [Github] (with Weige Huang), `cluscov` [CRAN] [Website] [GitHub](with Abdul-Nasah Soale), `RpacSPD` [Website] [GitHub]

C projects: `metricsC` [GitHub], `RdotC` [Website] [GitHub],

Fortran projects: `metricsFortran` [GitHub]

Matlab, Stata, Octave, Python, LaTeX, Microsoft Office

Languages

Ewe (mother tongue), English (fluent, official language of Ghana), French (fluent, DALF C2), Spanish (fluent, DELE B2), German (intermediate), Portuguese (intermediate), Twi

Honors and Fellowships

1. Research Fellowship, Department of Economics, Summer 2019
2. Research Fellowship, Department of Economics, Summer 2017

References

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