

# Ao WANG

Center for Research in Economics and  
Statistics (CREST)  
5 Av. Henri Le Chatelier  
91120 Palaiseau, France

Phone: (+33) 7 77 79 52 41  
Email: [ao.wang@ensae.fr](mailto:ao.wang@ensae.fr)  
Homepage: <https://sites.google.com/view/aowang-economics>

**Placement Director:** Francis Kramarz [francis.kramarz@ensae.fr](mailto:francis.kramarz@ensae.fr), (+33) 1 70 26 68 14

## References

Philippe Choné Professor, CREST-ENSAE 5 Av. Henry Le Chatelier 91128 Palaiseau, France (+33) 1 70 26 66 94 <a href="mailto:philippe.chone@ensae.fr">philippe.chone@ensae.fr</a>	Xavier D'Haultfoeuille (Advisor) Professor, CREST-ENSAE 5 Av. Henry Le Chatelier 91128 Palaiseau, France (+33) 1 70 26 67 95 <a href="mailto:xavier.dhaultfoeuille@ensae.fr">xavier.dhaultfoeuille@ensae.fr</a>	Alessandro Iaria Lecturer, University of Bristol 2B11, The Priory Road Complex Priory Road, BS8 1TU, Bristol, UK +44 (0) 117 331 7912 <a href="mailto:alessandro.iaria@bristol.ac.uk">alessandro.iaria@bristol.ac.uk</a>
--	--	---

## Education

2016-now Ph.D. in Economics, CREST, France  
2014-2016 Master in Economics, Ecole Polytechnique/ENSAE, France, *summa cum laude*  
2015-2016 Diplôme d'ingénieur, ENSAE, France  
2012-2016 Diplôme d'ingénieur, Ecole Polytechnique, France  
2008-2012 B.S. Probability and Statistics, Peking University, China

## Visiting Positions

Sep.-Oct.2019 Visiting Fellow, Division of the Humanities and Social Sciences, Caltech (hosted by Matt Shum)  
Jun.-Aug.2011 Research Experience for Undergraduates (REU) Program, Department of Mathematics, Pennsylvania State University  
Feb.-Jul.2010 Visiting student, Department of Mathematics, National Taiwan University

## Working Papers

**(Job Market Paper)** A BLP Demand Model of Product-Level Market Shares with Complementarity, [here](#)

Applied researchers most often estimate the demand for differentiated products assuming that at most one item can be purchased. Yet multiple purchases are pervasive. Ignoring this feature can lead to erroneous counterfactuals, in particular, because complementarities are ruled out. I consider the identification and estimation of a random coefficient discrete choice model of bundles, namely sets of products, when only product-level market shares are available. This last feature arises when only aggregate market shares, as opposed to individual purchases, are available, a very common phenomenon in practice. Following the classical approach with aggregate data, I consider a two-step method. First, using a novel inversion result where demand can exhibit complementarity, I recover the mean utilities of products from the product-level market shares. Second, to infer the structural parameters from the mean utilities while dealing with price endogeneity, I use instrumental variables. I provide low-level conditions under which the model is globally identified through moment conditions based on such instruments. Finally, I examine the practical performance of the methods in the context of the ready-to-eat (RTE) cereal industry in

the US. Aligned with recent findings in the literature, the estimation results suggest substantial complementarities among different RTE cereal brands. Ignoring such complementarities results in misleading counterfactuals.

Identification and Estimation of Demand for Bundles (with Alessandro Iaria), [here](#)

We present an instrument-free identification and estimation strategy of a mixed logit model of demand for bundles with endogenous prices. Our instrument-free approach hinges on an affine relationship between the utilities of single products and of bundles, on an essential real analytic property of the mixed logit model, and on mild restrictions on the price-setting model. We propose a concentrated MLE that substantially alleviates the challenge of dimensionality inherent in estimation. Finally, we estimate demand and supply in the US ready-to-eat cereal industry, where our estimator reduces the numerical search from approximately 12000 to 130 parameters. Our results suggest that ignoring demand synergies among different products often (or rarely) purchased in bundles results in misleading demand estimates and counterfactual simulations.

Estimating the Gains (and Losses) of Revenue Management (with Xavier D'Haultfoeuille, Philippe Février, Lionel Wilner), [here](#)

If the rise of revenue management (RM) has increased flexibility in the way firms set their prices, firms usually still impose constraints on their pricing strategy. There is yet scarce evidence on the gains or losses of such strategies compared to uniform pricing or fully flexible strategies. In this paper, we quantify these gains and losses and identify their underlying sources in the context of French railway transportation. We develop for that purpose a structural model of demand and supply of train tickets. Demand cannot be identified in a standard way due to censoring and the absence of instruments. We develop an original strategy combining temporal variations in relative prices and moment inequalities stemming from basic rationality on consumers' side and weak optimality conditions on the firm's pricing strategy. Our results suggest significant gains of the actual RM compared to uniform pricing, but also substantial losses compared to the optimal pricing strategy. Finally, we highlight the key role of RM for acquiring information when demand is uncertain.

## Work in Progress

A Generalized Nested Logit Model of Demand for Bundles (with Alessandro Iaria)

Identification of Marginal Costs and Conduct Parameters in Price-Setting Games (with Alessandro Iaria)

## Fundings and Awards

2019-2020 Labex ECODEC doctoral scholarship.

2019-2020 Labex Multi-Partnership Grant, *Investigation on the Impacts of Banning Mobile Phone Use at Schools*, €15,000, with Christophe Bellego (CREST), Xitong Li (HEC Paris).

2018-2019 BA/Leverhulme Small Research Grant, £10,000, by Alessandro Iaria

2016-2019 AMX Fellowship, Ecole Polytechnique

2012-2016 International Student Fellowship, Ecole Polytechnique

2015 *Best Research Internship Award*, Ecole Polytechnique

2011 *Academic Excellence Award*, Peking University

## Seminars and Conferences

### Seminars

- 2019 Paris School of Economics; GSM, Peking University; University of Bristol; Caltech;
- 2017 CREST Microeconometrics seminar.

### Conferences

- 2019 IIOC (Boston), CEPR Applied IO/JIE School (Madrid), JEI (Madrid)
- 2018 CREST-ECODEC Conference “Economics of Antitrust and Consumer Protection”, EARIE “Rising Stars” session, International Conference on Innovation and Industrial Economics (Nanjing)

### Training Programs

- 2018 Jerusalem Summer School of Economics on Industrial Organization, Israel Institute for Advanced Studies, Hebrew University of Jerusalem
- 2017 Easter Training School “Applications of Empirical Industrial Organization Methods”, Royal Economic Society, University of Essex

## Teaching

- 2016-2019, [ENSAE](#), Graduate level: Econometrics (business track), Econometrics, Microeconomics I, Game Theory, Statistics.

## Personal

- Born on the 9th September 1990; languages: Chinese (mother tongue), French, English
- 2016-2019, President, Alumni Association of Peking University in France