Hanlin Zhao

Toulouse School of Economics
1 Esplanade de l'Université
31080 Toulouse Cedex 06, France

hanlin.zhao@tse-fr.eu
hanlin-zhao.github.io

Placement Officers Mathias Reynaert (mathias.reynaert@tse-fr.eu); Paul Diegert (paul.diegert@tse-fr.eu)
Placement Administrator Louise Strachan (louise.strachan@tse-fr.eu)

Education

Toulouse School of Economics
Ph.D. in Economics — 2027 (expected)
Visiting Scholar, **New York University Stern School of Business** (host: Raluca M. Ursu) — Fall 2025
M.Res. in Economics — 2022
M.Sc. in Economic Theory and Econometrics — 2021

Paris-Panthéon-Assas University
B.Sc. in Economics (CMI EFiQuaS, Collège d'Économie) — 2019

Research Interests

Primary Empirical Industrial Organization, Digital Economics
Secondary Quantitative Marketing, Structural Econometrics

References

Mathias Reynaert (advisor)
Professor of Economics
Toulouse School of Economics
mathias.reynaert@tse-fr.eu

Andrew Rhodes (advisor)
Professor of Economics
Toulouse School of Economics
andrew.rhodes@tse-fr.eu

Jacques Crémer
Professor of Economics
Toulouse School of Economics
jacques.cremer@tse-fr.eu

Raluca M. Ursu
Associate Professor of Marketing
NYU Stern School of Business
rursu@stern.nyu.edu

Job Market Paper

1. Decoding Rankings: Consumer Search, Price Competition, and Platform Regulation

Online platforms often guide consumer choice through ranked lists. Consumers benefit from a ranking ordered by consumer surplus, but the platform gains from steering them toward high-commission offers. The platform's actual ranking balances these interests through a weight on commission. Consumers learn about this monetization weight and adjust their search accordingly, so the effect of steering depends on the gap between the actual and perceived weights. Using Expedia data, we estimate a structural model of consumer search and hotel pricing that separately identifies both weights. We find that consumers substantially under-perceive monetization and overtrust the ranking. Because steering distorts demand and price competition, regulators debate two remedies: transparency corrects consumers' interpretation of the ranking, and neutrality removes commission from the ranking's objective. We find that transparency alone lowers consumer welfare, and neutrality alone yields a limited gain. The policies are complements and combining them benefits consumers most.

Presentations: TSE Online Seminar on the Economics of Platforms; TSE workshops.

Working Papers

** presented by a coauthor*

2. Estimating Choice Models with Unobserved Expectations over Attributes

with Mathias Reynaert and Wenxuan Xu

Agents often choose based on expectations about uncertain attributes, yet researchers rarely observe the information behind those expectations. We develop two methods to estimate discrete choice models with heterogeneous, unobserved information sets. Our point-identification approach uses repeated realizations of the uncertain attribute to estimate its statistical process with observed predictors and recoverable latent factors, then represents conditional expectations as a finite mixture over these components. A complementary approach set-identifies preferences using partial information about expectations. Both methods apply to individual- and market-level data. Applications to firms' export decisions and consumers' automobile purchases show that our method corrects for substantial bias in preference estimates that arises when unobserved information heterogeneity is ignored.

Presentations: International Industrial Organization Conference (IIOC) 2025; European Association for Research in Industrial Economics (EARIE) Annual Conference 2025*; Asia-Pacific Industrial Organization Conference (APIOC) 2024; University of Vienna*, Northwestern University*, University of Helsinki*; TSE workshops.

3. Patent Challenge and Generic Entry

with Xin Zhang

Pharmaceutical innovation depends on strong primary patents that allow originators to recoup R&D costs. However, drug companies often engage in evergreening that prolongs patent protection by filing follow-on patents with little therapeutic gain. We study a policy lever that works with market forces to screen out weak follow-on patents: the Hatch-Waxman Act, which incentivizes challenges to evergreening patents by granting the first successful challenger a period of marketing exclusivity. We investigate how the length of first-filer exclusivity shapes generic firms' incentives to initiate challenges, which can curb the extra monopoly protection created by ever-greening while preserving incentives for genuine discovery and protecting consumer welfare through earlier generic entry. Using a two-stage structural model that endogenizes challenge and entry decisions, we estimate the fixed costs of generic entry with moment inequalities. We find that the current 180-day exclusivity raises challenge rates by about 4 percentage points. Extending exclusivity primarily activates challenges in markets that would otherwise go unchallenged: a two-year exclusivity increases the challenge rate to 15.38%. Effective exclusivity is highly heterogeneous across therapeutic classes: reaching a 20% challenge rate requires roughly two years for antimicrobials but less than one year for genitourinary drugs.

Presentations: Northwestern University*; Kellogg School of Management*; TSE workshops.

4. Specification Test for Models of Consumer Search

Measuring consumer preferences requires knowing how consumers search. This paper develops a search-conduct test that distinguishes sequential from simultaneous search with differentiated products and outside options. The framework allows individual- and product-specific search costs and observed or unobserved searched attributes. Estimating both models with a unified maximum-likelihood approach, I develop a corrected Vuong test to compare their fit. Monte Carlo evidence shows that misspecified search conduct generates inconsistent preference estimates and that the test reliably selects the correct model.

Presentations: European Association for Research in Industrial Economics (EARIE) Annual Conference 2025; Doctoral Workshop on the Economics of Digitization 2025; TSE workshops.

Work in Progress

1. Identification of Consumer Search Models with Moment Inequalities
2. Disintermediation, Platform Competition, and Ranking Algorithms, with Steve (Shitai) Zhang
3. Ranking Competition under Two-Sided Learning, with Chuqing Jin

Teaching and Research Experience

Teaching Assistant, Toulouse School of Economics

Undergraduate Finance (taught in French)	Spring 2024, Spring 2025
Graduate Econometrics	Fall 2024
Undergraduate Econometrics	Spring 2023, Spring 2024
Graduate Empirical Industrial Organization	Fall 2023

Research Assistant to Céline Bonnet and Catarina Goulão — Summer 2020, Winter 2021

Fellowships and Awards

Best Teaching Assistant Award, Toulouse School of Economics	2023
Mobility Grant, Toulouse School of Economics	2025
Doctoral Fellowship, Toulouse School of Economics	2020–2026

Professional Service

Co-organizer, TSE Industrial Organization Workshop	2023–2024

Other Information

Programming	MATLAB, Python, R, Julia, Stata, SAS, SQL, Mathematica; HPC cluster computing
Languages	English, French, Chinese