THOMAS BOURANY

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Research and Teaching Fields

Primary: Macroeconomics, Climate Economics, Trade Economics
Secondary: Fiscal and Monetary Policies, Computational Econ, Macro-Finance, Energy Economics

Education

University of Chicago, Ph.D. Economics *2019–2025*

University of Chicago, M.A. Economics *2018–2019*
MAPSS

UPMC – Sorbonne Université, M.Sc. Mathematics *2016–2018*
Applied Mathematics for Modeling, with honors

Sciences Po, École Polytechnique & Ensae, M.A. Economics *2014–2016*
Economics and Public Policies (EPP)

Sciences Po. & UPMC–Sorbonne Université, Dual Bachelor *2011–2014*
Sciences and Social Sciences, with honors

- B.A. Social Sciences, "Diplôme du Collège universitaire" – Sciences Po Paris
- B.Sc. Mathematics – UPMC-Sorbonne Paris
- Exchange program – Indian Institute of Technology, Madras, Chennai, India

References

Professor Mikhaïl Golosov (Chair)
University of Chicago
Kenneth C. Griffin Department of Economics
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Professor Esteban Rossi-Hansberg
University of Chicago
Kenneth C. Griffin Department of Economics
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Professor Lars Hansen
University of Chicago
Department of Economics, Statistics
and Booth School of Business
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Job Market Paper

The Optimal Design of Climate Agreements, Inequality, Trade and Incentives for Carbon Policy

Abstract: *How can we design a climate agreement that implements the optimal climate policy? In the presence of inequality, trade, and policy constraints, the lack of climate cooperation and free-riding incentives are exacerbated. Through the lens of an Integrated Assessment Model (IAM) with heterogeneous countries and bilateral trade, I study the taxation of carbon when countries can deviate from applying the optimal policy. First, I derive the welfare costs of climate change, and the second-best fossil fuel taxes and trade tariffs in the presence of inequalities, and general equilibrium effects through energy and good trade. When countries can exit climate agreements, participation constraints create a policy tradeoff between an intensive margin – a "climate club" with few countries but a carbon tax closer to the first best, and large emission reduction – and an extensive margin – accommodating a larger number of countries at a cost of lowering the carbon tax. As in Nordhaus (2015), trade sanctions for non-participants are crucial to ensure the stability of an agreement: the optimal design depends on (i) gains from trade, (ii) distortionary effects of energy taxes, and (iii) climate damages. I propose a method to handle the combinatorial policy design problem.*

Working Papers

The Optimal Energy Policy, and the Inequality of Climate Change

Abstract: *What is the optimal policy to fight climate change? Taxation of carbon and fossil fuels has strong redistributive effects across countries: (i) curbing energy demand is costly for developing economies, which are the most affected by climate change in the first place, (ii) taxation has strong general equilibrium effects through energy markets and trade reallocation. Through the lens of an Integrated Assessment Model (IAM) with heterogeneous countries, I show that optimal carbon policy depends crucially on the availability of redistribution instruments. After characterizing the Social Cost of Carbon (SCC), I derive formulas for second-best fossil fuel taxes in the presence of inequalities in climate damages and incomes, redistributive effects through energy and good trade, and participation constraints if countries can exit climate agreements. I show that a uniform carbon should be reduced twofold in the presence of inequality. If country-specific carbon taxes are available, the distribution of carbon prices is proportionally related to the level of income: poor and hot countries should pay lower energy taxes than rich and cold countries. These qualitative results are general and I propose extensions with international trade, uncertainty, or participation constraints when countries can leave climate agreements.*

Supply chain disruptions and diversification
(with Ignacia Cuevas and Gustavo Gonzalez)

Abstract: *Supply chain disruptions are becoming increasingly frequent, generating uncertainty for firms that need to source inputs to produce. We aim to understand whether firms, faced with supply chain disruption risk, would choose to diversify their sourcing from foreign countries, engage in re-shoring, or select suppliers based on cost or risk considerations. To answer this, and drawing inspiration from Antràs, Fort, and Tintelnot (2017), we write a multi-country sourcing model considering firms' self- selection into importing based on productivity, cost minimization, and trade disruptions that can alter the cost of importing. Our findings reveal that, even in the presence of aggregate or idiosyncratic uncertainty, a clear pecking order emerges, with larger firms self-selecting into importing from a more extensive set of suppliers. Despite the quantitative significance of marginal cost reduction as the primary driver of firms' sourcing decisions, risk introduces a nuanced dimension. Specifically, firm- specific import risk introduces a positive option value associated with diversifying the set of suppliers. Meanwhile, country-specific aggregate uncertainty has an ambiguous impact since it affects the market demand, leading to a reduction in firms' profits, as well as giving a positive option value. To empirically validate our model, we estimate supply chain disruption uncertainty and fixed costs of sourcing using firm-level data from Chile. Our analysis includes counterfactual scenarios to assess the impact of external shocks, such as the Covid-19 pandemic, on firms' sourcing strategies. Through this research, we contribute to understanding how firms navigate supply chain uncertainties and make strategic sourcing decisions in the face of disruptions.*

A Perturbational Approach for Approximating Heterogeneous-Agent Models
(with Mikhaïl Golosov, Anmol Bhandari, and David Evans)

Abstract: *We develop a perturbational technique to approximate equilibria of a wide class of discrete-time dy- namic stochastic general equilibrium heterogeneous-agent models with complex state spaces, including multi-dimensional distributions of endogenous variables. We show that approximating policy functions and stochastic process that governs the distributional state to any order is equivalent to solving small systems of linear equations that characterize values of certain directional derivatives. We analytically derive the coefficients of these linear systems and show that they satisfy simple recursive relations making their numerical implementation quick and efficient. Compared to existing state-of-the-art techniques, our method is faster in constructing first-order approximations and extends to higher orders, capturing the effects of risk that are ignored by many current methods. We illustrate how to apply our method to a broad set of questions such as impacts of first- and second-moment shocks, welfare effect of macroeconomic risk and stabilization policies, endogenous household portfolio formation, and transition dynamics in heterogeneous agent general equilibrium settings.*

Non-Keynesian stabilizers and inflation spirals
(with Xavier Ragot and François Le Grand)

Abstract: *When both prices and wages are subject to nominal frictions, an increase in input prices such as energy can trigger a wage-price spiral, as both nominal wages and prices adjust slowly. To analyze optimal policy in this environment, we consider a heterogeneous-agent model, with both wage and price stickiness. We derive joint optimal fiscal-monetary policy, using a rich set of fiscal tools, for both supply and demand shocks. We first identify the set of fiscal instruments that implements nominal price and wage stability as an optimal outcome. Starting from this equivalence result, we remove fiscal instruments to identify the most efficient one for restoring price and wage stability. A time-varying wage subsidy appears to be a powerful tool to stabilize inflation and activity over the business cycle. We call this policy a non-Keynesian stabilization policy because it does not operate directly through aggregate demand management. Finally, we compare the results with those obtained in the representative agent economy*

When is aggregation enough? Aggregation and Projection with the Master Equation

Abstract: *In this paper, I adapt the Master Equation – developed in the Mean Field Games literature – to economic applications. In particular, I show how one can apply projection methods to obtain a global characterization of the value, agent policy, and aggregate dynamics in heterogeneous agents models with aggregate risk.*

Work in Progress

Energy shocks and aggregate fluctuations, 3rd-year paper

Credit Cycles, Asset prices, and Heterogeneous Firms, 2nd-year paper

Pre-Doc

Wealth distribution over the business cycle, A mean-field game with common noise,
Master thesis (M2) in 2018, M. Sc. Mathematics at UPMC-Sorbonne. Supervisor: Yves Achdou

Fiscal policy in monetary union
Master thesis (M2) in 2016, M.A. Economics / EPP. Supervisor: Jean Baptiste Michau

Fiscal Policy and Tax compliance over the business cycle
Master thesis (M1) in 2015, M.A. Economics / EPP. Supervisor: Francesco Pappadà

Teaching Experience

University of Chicago, Department of Economics

Mathematical Methods in Economics, *PhD*	Lecturer	*Summer 2020, 2021 & 2022*
Applied Macroeconomics: Heterogeneity & Macro, *PhD*	TA for Prof. J. Vavra, R. Kekre	*Winter 2022*
Monetary Economics, *PhD*	TA for Prof. F. Alvarez	*Fall 2021*

Chicago Booth School of Business

Global Strategy and Economics, *EMBA*	TA for Prof. G. Lorenzoni	*Spr. 2022, 2023, 2024*
International Financial Policy, *MBA*	TA for Prof. R. Kekre	*Spr. 2020, 2021, 2022*
Money and Banking, *MBA*	TA for Prof. K. Huber	*Winter 2021*

University of Chicago, The College

Economic Policy Analysis, *undergrad*	TA for Prof. K. Kuevibulvanich	*Spring 2019*

Sciences Po, Doctoral School, Economics Department

Graduate Macroeconomics & finance, *PhD*	TA for Prof. X. Ragot	*Fall 2016, 2017*
Fiscal and monetary policy, *PhD*	TA for Prof. J. Barthelemy	*Fall 2016*

Sciences Po, School of Public Affairs, Master in Public Policy

Macroeconomics, *MPP*	TA for Prof. T. Chaney	*Fall 2016, Spr. 2018*
Macroeconomics for public policy, *MPP*	TA for Prof. X. Ragot, P. Andrade	*Spr. 2016*
Public Economics, *MPP*	TA for Prof. Mark Stabile	*Fall 2015*
Quantitative Analysis, *MPP*	TA for Prof. M. Foucault	*Fall 2015*

Awards, Scholarships, and Grants

Stevanovich Fellowship Award	*2024*
3-Minutes Thesis Competition, Finalist	*2024*
University of Chicago MAPSS Merit Scholarship	*2018*
Sciences Po, Prize for the Best Master Thesis in Economics	*2016*
École Polytechnique, Prize for the Research Internship	*2015*

Research Experience

Research Assistant, University of Chicago
Prof. Mikhaïl Golosov — *2019–2021*

Research Assistant (ponctual), University of Chicago
Prof. Greg Kaplan, Prof. Robert Lucas, Prof. Kilian Huber — *resp. 2019, 2020, 2023*

Research Intern, Université Paris Diderot
Prof Y. Achdou — *2018*

Research Intern, Banque de France, International Macro Division & Forecasting
Prof F. Pappadà and Y. Zylberberg — *2015*

Academic Experience

Conferences

2024: NBER SI Macro-Public Finance, *Boston*, EEA-ESEM, *European Economic Association, Rotterdam*, Society of Economic Dynamics, *Barcelona*,
Dynamic Quantitative Trade – JIE special conference, *UWisconsin, Madison*
Yiran Fan Conference, *UChicago*, 49th Conf., *Eastern Economic Association, Boston*
2023: Economic & Environmental Consequences of Climate Change, *IMSI UChicago*,
HEC Economics PhD Conference, *HEC, Paris Area*
2018: Macroeconomic Implications of Micro Heterogeneity, *OFCE, Paris*
Note: only presentations of solo/junior projects

Presentations

2023-2024: Young Scholars Webinar on Climate Economics, *E-axes Forum*
EPIC Lunch, MFR Summer session for Young scholar (poster),
Climate Frontiers: Energy and Climate (poster), *UChicago*
2020-2024: PhD workshops (Macro, Trade, Environment, Finance), *UChicago*
2017, 2023: PhD workshops, *Sciences Po*
2019: Fiscal Affairs Department, *International Monetary Fund*
2018: Workshop on MFG, *Université Paris Diderot*
2015: DGEI Internal Conference, *Banque de France*

Refereeing Activity

▷ *Journal of Political Economy*, ▷ *Journal of European Economic Association (×2)*
▷ *Theoretical Economics*, ▷ *Journal of Political Economy, Macroeconomics*,
▷ *Journal of International Financial Markets, Institutions & Money*,
▷ *IEEE Transactions on Automatic Control (Maths)*

Seminar organization:

Student organizer of Capital Theory, UChicago	*2023–2025*
Student organizer of Advanced Macro Reading Group, UChicago	*2022–2024*
Organizer of 2nd-3rd year students Macro workshop, UChicago	*2019–2020*

Others student activities:

Graduate Student Liaison (GSL) – Student representative, UChicago	*2023–2025*
Political Economy Club (PEC) – Social Events, UChicago	*2021–2022*

Additional Information

Citizenship France

Programming Skills Julia, Matlab, Dynare, Stata, Python, R

Languages French (Native), English (Fluent), Spanish (Intermediate)