

Master in Quantitative Economics

Master 2 Track- Quantitative Economic Analysis

Compendium of the syllabus Academic Year: 2020-2021

Summary of the program

Master 2 Track Quantitative Economic Analysis				
3 specialization fields : Theory THEO / Social and public policies SPP / Macro & Finance MF				
Master 2, Semester 1				
Course	Course load	Field	ECTS	Teacher
Quantitative methods, obligatoire min 18 ECTS				
<u>Mandatory courses (12 ECTS)</u>				
Information Economics	36 h	THEO, SPP, MF	6	Françoise Forges
Machine Learning (*)	36 h		6	Fabrice Rossi
<u>Optional courses (6 ECTS)</u>				
Advanced Microeconometrics	30 h	THEO, SPP	6	Eric Bonsang
Advanced Macroeconometrics	24 h	THEO, MF	3	Gauthier Vermandel, Magali Marx, Sylvain Benoit
Modelling in Decision Aiding and Operational Research	15 h	THEO, SPP	3	Daniel Vanderpooten
Preference Modelling and Multiple Criteria Decision Making	15 h	THEO, SPP	3	Brice Mayag
Bayesian techniques in Macroeconomics	15 h	MF	3	Gauthier Vermandel
Finance in continuous time	24 h	THEO, MF	3	René Aid

(*) Depending on the student's background, it will be asked to follow a refresher course (September)				
Specialization courses, 12 ECTS, 4 courses, mandatory within the field				
Behavioral economics and bounded rationality	27 h	THEO, MF, SPP	3	Bertrand Villeneuve
Empirical Industrial Organization	27 h	THEO, MF, SPP	3	Daniel Herrera
Advanced Game Theory: Bayesian games and Information design	21 h	THEO, SPP	3	Françoise Forges, Sidarta Gordon
Health Economics	27 h	THEO, SPP	3	Florence Jusot
Development microeconomics	21 h	SPP	3	Phillipe de Vreyer
The Economics of Energy and the Environment	27 h	SPP	3	Jan-Horst Keppler
International Trade & International Macroeconomics	27 h	MF	3	Gianluca Orefice / Lise Patureau
Business Cycles and Stabilization policies	27 h	MF	3	Gauthier Vermandel / Anne Epaulard
Asset pricing	27 h	MF, THEO	3	Jérôme Dugast
Semester 2				
Specialization courses, 3 to choose within the chosen field, 9 ECTS				
Transport and variational problems in economics	15 h	THEO	3	Guillaume Carlier
Individual and collective decisions	24 h	THEO, SPP	3	Jean-Philippe Lefort / Remzi Sanver / Sidarta Gordon
Advanced Health economics	18 h	THEO, SPP	3	Brigitte Dormont
Policies in developing countries	21 h	SPP	3	Véronique Gilles / Olivia Bertelli
Labor Economics	18 h	SPP	3	Eve Caroli
Research Methods in Monetary Economics	18 h	MF	3	Richard Dutu / Mariana Rojas-Breu
Advanced Macroeconomics: Frictions & Policies	18 h	MF	3	Gauthier Vermandel/ Lise Patureau
Banking economics	18 h	MF	3	Mariana Rojas-Breu
Research seminar, choose 1 (within the chosen field), 3 ECTS				
Topics in Health and Ageing	18 h	SPP	3	Brigitte Dormont / Eric Bonsang
Research Seminar: Market regulation	18 h	THEO, MF, SPP	3	Sven Heim / Bertrand Villeneuve
Topics in Macroeconomics & Finance	18 h	MF	3	Anne Epaulard / Richard Dutu
Master Thesis, 18 ECTS				

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Please pay attention to the specialization fields and their corresponding courses.

There are three specialization fields :

- Theory (THEO)
- Social and Public Policies (SPP)
- Macroeconomics & Finance (MF)

Except for the two mandatory courses (Information Economics & Machine Learning, Semester 1), the chosen specialization field conditions the courses to be followed

Details of the courses

Semester 1

Advanced Game Theory: Bayesian games and Information Design (THEO, SPP)

Teacher:

Françoise FORGES, University Paris-Dauphine, LEDa & PSL Research University
Siddhartha GORDON, University Paris-Dauphine, LEDa & PSL Research University

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Information on the course

Semester 1

Course load: 21 h (7 sessions of 3h)

ECTS: 3

Overview:

The course is divided into two parts.

The first part is devoted to so-called “noncooperative games” and concentrates on multistage games with incomplete information played by Bayesian players. The agents’ rationality is analyzed through various solution concepts, capturing backward and/or forward induction. These solution concepts are applied to strategic information transmission and communication.

In the second part, we will introduce a recent literature on the choice of an information structure by a designer (or principal) for an agent or a set of agents who interact strategically in an asymmetric information setting.

Prerequisites :

Master 1 Courses : Mathematics and optimization, Game theory

Course Objectives:

The objective of the course is to give a deep background in interactive decision-making and its applications. We will notably present the recent developments in the field of microeconomics that address the issue of how information should be designed under informational asymmetries across agents.

After having attended the classes, the students will be able to read recent academic papers applying game theory to various area of economics and to make use of game theory in their future research work.

Mode of Assessment

Regular home work, final written exam, with the following weights:

- Final exam 90%
- In-class participation 10%.

Course Schedule

1	Multistage games with incomplete information played by Bayesian players, equilibrium concepts capturing backward induction (variants of sequential equilibrium).
2	Equilibrium concepts capturing forward induction. Reputation models.
3	Multistage games with partially verifiable information, “unraveling” reasoning.
4	Correlated equilibrium and communication equilibrium. Strategic information transmission.
5	Information design: The case of one sender and one receiver
6	Information design: Extensions to multiple senders, receivers and dynamic settings
7	Information design: Bayes Correlated Equilibrium

Readings

Basic readings

- J. Harrington, “Games, strategies and decision making”, 2d edition, Mc Millan, 2015.
- M. Osborne, A. Rubinstein “A course on game theory”, MIT Press, 1994 (available online).
- M. Osborne “An introduction to game theory”, Oxford University Press, 2003 (elementary version of the previous one).
- Myerson, R. “Game Theory: analysis of conflict”, Harvard University Press, 1991.

List of selected articles for Sessions 5 to 7

- Bergemann D. and Morris S. (2019), Information Design: a Unified Perspective, *Journal of Economic Literature*.
- Kamenica E. and Gentzkow M. (2011), Bayesian Persuasion, *American Economic Review*.
- Bergemann D. and Morris S. (2016), Bayes Correlated Equilibrium and the Comparison of Information Structures in Games, *Theoretical Economics*.

Advanced Macroeconometrics (THEO, MF)

Teacher:

Sylvain BENOIT (Université Paris Dauphine, LEDa & PSL Research University)

Magali Marx (Banque de France)

Gauthier Vermandel (Université Paris Dauphine, LEDa & PSL Research University)

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Informations on the course :

Semester 1

Course load: 24 hours, 9 sessions of 3 hours

ECTS : 3

Overview:

This course provides advanced econometrics tools for applied macroeconomics. Emphasis is on hands-on implementation of the methods covered in the course. Topics include macroeconomic data, linear and nonlinear time series models, practical issues with likelihood-based inference for these models, computational approaches to hypothesis testing and model comparison, forecast evaluation, and structural identification.

Prerequisites

Master 1 courses: Macroeconometrics, Statistical & Mathematical tools

Course Objectives:

The course provides a deep knowledge of the advanced time series techniques and their application to macroeconomics. A technical presentation of these models will be given, before studying applications of these models to macroeconomics.

The course will equip students with the necessary knowledge to be able to undertake econometric analysis of the type commonly associated with modern macroeconomic research. Substantial emphasis will be placed on the development of programming skills in MATLAB.

Mode of Assessment

Course grades for will be based on a course paper (50%) and a homework assignment in group of two students (50%).

Planning / Course Schedule

1	VAR with several methods for identifying shocks (Cholesky, Blanchard-Quah, sign restrictions...)
2	Structural VAR model, HP filter, Kalman Filter, FAVAR and PCH-VAR
3	Simulated method of moments
4	Nonlinear model (Markov-switching, STAR...)
5	Intertemporal optimization and the GMM method
6	Estimating rational expectations models with GMM
7	Univariate and Multivariate volatility models
8	Contagion models (direct and indirect effects decomposition)

Readings

- Canova, F. (2007), *Methods for Applied Macroeconomic Research*, Princeton University Press.
- DeJong, D.N., and D. Chetan (2011), *Structural Macroeconometrics*, 2nd ed., Princeton University Press.
- Diebold, F.X. and K. Yılmaz (2009) Measuring Financial Asset Returns and Volatility Spillovers, with Application to Global Equity Markets. *The Economic Journal*, 119(1), 158-171.
- Diebold, F.X. and K. Yılmaz (2012) Better to Give than to Receive: Predictive Directional Measurement of Volatility Spillovers, *International Journal of Forecasting*, 28(1), 57-66.
- Duffie, D. and K.J. Singleton (1993), “Simulated Moments Estimation of Markov Models of Asset Prices”, *Econometrica* 61, 929–952.
- Enders, W. (2004), *Applied Econometric Time Series*, 2nd edition, New York: Wiley.
- Favero, C.A. (2001), *Applied Macroeconometrics*, Oxford University Press.
- Gouriéroux, C., A. Monfort, and E. Renault (1993), “Indirect Inference”, *Journal of Applied Econometrics* 8, S85–S118.
- Kilian, L., and H. Lütkepohl (2017), *Structural Vector Autoregressive Analysis*, Cambridge University Press.
- Lütkepohl, H. (2005, 2010), *New Introduction to Multiple Time Series Analysis*, 1st ed., New York: Springer-Verlag (Paperback).
- Pindyck, Robert S., and Daniel L. Rubinfeld. *Econometric Models and Economic Forecasts*, 4th edition. Irwin/McGraw-Hill (1998)

Advanced Microeconometrics (THEO, SPP)

Teacher:

Eric Bonsang (Université Paris Dauphine & PSL Research University, LEDa)

Contact information: eric.bonsang@dauphine.psl.eu

Informations on the course :

Semester 1

Course load: 30h, 10 sessions (3 hours per session)

ECTS: 6

Overview:

This course explores different topics in applied microeconometrics. It focuses on causal inference and how econometrics can help identify causality in a credible way. It discusses the advantages and limitations of particular types of approaches/tools that are used in econometrics. It covers the following topics: Causal inference and identification, Randomized experiment, Regression and causality, Instrumental variables approach, Difference-in-differences estimation and Regression discontinuity designs. The course will review the theory underlying those different techniques and will discuss the recent studies that have applied those different methods to make causal inference.

Prerequisites

M1 Courses: Microeconometrics, Database & Stata programming

Course Objectives:

The objective of the course is to provide students the econometric methods aiming at identifying causal relationships. These methods are widely applied in economics to assess the effects of policy interventions and other treatment on interest. After attending the classes, the students will be able to have a deep understanding and a critical view on studies aiming at identifying causal effects and to apply those methods for their own research.

Mode of Assessment

Short paper + exam and active participation in class

Planning / Course Schedule

1	Causal inference and identification/ Randomized experiment
2	Regression and causality
3	Instrumental variables approach with heterogeneous effects: part 1
4	Instrumental variables approach with heterogeneous effects: part 2
5	Instrumental variables approach for nonlinear models
6	Difference-in-differences estimation
7	Regression discontinuity designs
8	Applications with Stata 1
9	Applications with Stata 2
10	Presentation of the short empirical papers by the students

Readings

Mostly Harmless Econometrics, Joshua Angrist and Jörn-Steffen Pischke
Econometric Analysis of Cross-section and Panel Data, Jeffrey Wooldridge
Microeconometrics. Methods and Applications, A. Colin Cameron and Pravin K. Trivedi

[Asset pricing \(MF\)](#)

Teacher:

Jérôme Dugast (Université Paris-Dauphine, DRM-Finance & PSL)

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Information on the course :

Semester 1

Course load : 27h (9 sessions of 3h)

ECTS: 3

Overview:

The course will cover the following topics: Decision Making under Uncertainty; Mean-Variance Analysis and the CAPM; Arbitrage Pricing Theory and Factor Models; Equilibrium Consumption-based Asset Pricing; Dynamic Equilibrium Asset Pricing Models; Estimation and Evaluation of Asset Pricing Models; Asymmetric Information and Asset Prices; Illiquidity and Asset Prices; Behavioral Asset Pricing; Limits to Arbitrage.

Prerequisites

Master 1 courses: Mathematics and optimization, Microeconomics 2

Master 2: Finance in continuous time,

Course Objectives

In this course, we will discuss a wide range of topics ranging from no arbitrage, state prices, consumption-based asset pricing, and factor models to more special topics including asymmetric information and behavioral finance.

After attending the class, the students will be able to address issues related to the behaviors of agents and prices on financial markets on theoretical and empirical grounds.

Mode of assessment

Final exam: 60%. Paper presentation/refereeing: 40%.

Course schedule

1. Decision Making under Uncertainty
2. Mean-Variance Analysis and the CAPM
3. Arbitrage Pricing Theory and Factor Models
4. Equilibrium Consumption-based Asset Pricing
5. Dynamic Equilibrium Asset Pricing Models
6. Estimation and Evaluation of Asset Pricing Models
7. Asymmetric Information and Asset Prices
8. Illiquidity and Asset Prices
9. Behavioral Asset Pricing
10. Limits to Arbitrage

Readings

Textbooks

- Back, Kerry E., Asset Pricing and Portfolio Choice Theory, Oxford University Press, revised ed., 2017
- Cochrane, John H., Asset Pricing, Princeton University Press, revised ed., 2005

- Munk, Claus, Financial Asset Pricing Theory, Oxford University Press, 2013
- A list of papers will be added

Bayesian techniques in Macroeconomics (MF)

Teacher:

Gauthier Vermandel (Université Paris-Dauphine, LEDa & PSL Research University, France Stratégie)

Contact Information

Gauthier VERMANDEL: gauthier.vermandel@dauphine.psl.eu

Information on the course :

Semester 1

Course load: 15h, 5 sessions with 3 hours per session

ECTS : 3

Overview:

The lectures provide a self-contained introduction to the building, simulation and estimation of the Dynamic Stochastic General Equilibrium models that constitute the main workhouse of today's financial macroeconomics. These models, which incorporate micro-foundations, dynamic relations and rational expectations in a macroeconomic framework, have now become a powerful tool used in central banks for policy projections. The course will present the recent developments in Bayesian econometrics that are commonly used to estimate these models. After recalling the standard VAR (Vector Autoregressive) model *à la* Sims (1980), the course will present the Bayesian VAR model *à la* Sims & Zha (1998). These class of atheoretical models is then compared to theoretical DSGE models *à la* Smets & Wouters (2003, 2007).

Prerequisites

A solid background in both microeconomics and macroeconomics is a prerequisite. A background in Econometrics (time series + VAR models) and MATLAB programming are a plus but not compulsory.

Course Objectives:

The objective of the course is to equip the students with the more advanced estimation techniques of macroeconomic models. It will provide the most up-to-date tools to allow the students to get a deep knowledge of these models and to be able to read and understand policy and research papers using these approaches.

After having attended the classes, the students will master the up-to-date estimation techniques of the macroeconomic models which are now employed in policy institutions such as the ECB, the Banque de France or the IMF. Using the estimated models, students will be able to perform business cycles analysis (variance decomposition, inspecting propagation mechanisms, variance forecast error decomposition), as well as forecasting exercises using both VAR, B-VAR and DSGE

models. These types of skills are typically required in a growing number of policy-making institutions.

Mode of Assessment

Attendance, active participation, and assignments preparation prior to the lecture are strongly appreciated. In addition, the main assessment of this course is based on a 30-page project that is devoted to the estimation of a macroeconomic model based on DBnomics. Students are expected to select a country on DBnomics and a set of macroeconomic time series that will be used to the estimation of a DSGE model using Bayesian methods.

Planning / Course Schedule

1	AR, VAR and B-VAR Models. Constructing a likelihood function to estimate a state-space model. Use priors to penalize the likelihood function.
2	Solution methods and simulations for DSGE models. Linearization and Perturbation methods.
3	Estimation of the workhorse New Keynesian Model. Kalman filter, prior setting, posterior reading, Metropolis-Hasting algorithm.
4	Real Extensions: Consumption habits, Investment adjustment costs and fixed cost in the production function, Capital (Smets & Wouters, 2003). Nominal extension: sticky wages.
5	Trends in macroeconomics: stationarity vs deterministic/stochastic trends (Smets & Wouters, 2007).

Readings

Articles:

- An, S., & Schorfheide, F. (2007). Bayesian analysis of DSGE models. *Econometric reviews*, 26(2-4), 113-172.
- Christiano, L. J., Motto, R., & Rostagno, M. (2014). Risk shocks. *American Economic Review*, 104(1), 27-65.
- Sims, C. A. (1980). Macroeconomics and reality. *Econometrica: Journal of the Econometric Society*, 1-48.
- Sims, C. A., & Zha, T. (1998). Bayesian methods for dynamic multivariate models. *International Economic Review*, 949-968.
- Smets, F., & Wouters, R. (2003). An estimated dynamic stochastic general equilibrium model of the euro area. *Journal of the European economic association*, 1(5), 1123-1175.
- Smets, F., & Wouters, R. (2007). Shocks and frictions in US business cycles: A Bayesian DSGE approach. *American economic review*, 97(3), 586-606.
- Stock, J. H., & Watson, M. W. (2001). Vector autoregressions. *Journal of Economic perspectives*, 15(4), 101-115.

Textbooks:

- Durbin, J., & Koopman, S. J. (2012). *Time series analysis by state space methods* (Vol. 38). Oxford University Press.

Galí, J. (2015). *Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications*. Princeton University Press.
McCandless, G. (2008). *The abcs of rbc's*. Cambridge, Massachusetts, London.

Behavioral economics and bounded rationality (THEO, MF, SPP)

Teacher:

Bertrand Villeneuve (Université Paris-Dauphine, LEDa & PSL Research University)

Contact Information

Bertrand Villeneuve : bertrand.villeneuve@dauphine.psl.eu

Information on the course :

Semester 1

Course load: 27 hours, 9 sessions of 3 hours

ECTS : 3

Overview:

The course will study the main features motivating behavioural economics: Nonstandard preferences; nonstandard beliefs; nonstandard decision making. Emphasis will be set on presenting this expanding research field that incorporates elements of bounded rationality and behavioural economics in models that maintain the game theoretic tradition of high logical standards. By choice, the course will not be about experimental protocols, but rather on main ideas and debates.

Prerequisites

Standard microeconomic choice (static and intertemporal). Basic game theory (Nash perfect, Bayesian perfect).

Course Objectives:

The objective of the course is to present the most important themes in behavioral economics. The motivation of this dynamic research program is deeply empirical and sometimes anecdotal. Accordingly, many papers start by pointing at behaviors that standard models relying on the rationality assumption cannot explain. The course itself will focus in the ways the authors have modelled these puzzling features of human behaviors. We will study how, in turn, these models enable new predictions and fine tuning.

The topic has reached a certain degree of maturity. The course will examine the new standards to see where the research is going to. After studying the classes, the students will be able to read the cutting-edge research on the topic. Given the variety of ways by which standard models can be tweaked, the course is not intended to promote a particular view, but to help aspiring modelers to think about their choices.

Mode of Assessment

20% participation + 30% short prepared presentation during course + 50% written exam.

Planning / Course Schedule

1	Introduction. What classical models don't explain and why it matters.
2	Nonstandard preferences 1. Time inconsistency.
3	Nonstandard preferences 2. Reference dependence.
4	Nonstandard preferences 3. Social preferences.
5	Nonstandard beliefs. Overconfidence. Law of small numbers. Projection bias.
6	Nonstandard decision making. Framing and menu effects. Limited attention. Persuasion and social pressure.
7	Applications 1. Behavioral public policy.
8	Applications 2. Behavioral business applications (IO, marketing).
9	Applications 3. Miscellaneous.

Readings (short list)

Barberis, Nicholas C. (2013). Thirty Years of Prospect Theory in Economics: A Review and Assessment. *Journal of Economic Perspectives*. 27:1, 173-96.

DellaVigna, Stefano (2009). Psychology and Economics: Evidence from the Field. *Journal of Economic Literature*. 47:2, 315-72.

Galperti, Simone (2015). Commitment, Flexibility, and Optimal Screening of Time Inconsistency. *Econometrica*, 83:4, 1425-1465.

Gruber, Jonathan and Botond Köszegi (2004). Tax incidence when individuals are time-inconsistent: the case of cigarette excise taxes. *Journal of Public Economics*, 88:9-0, 1959-1987.

Kahneman, Daniel (2011). *Thinking Fast and Slow*. Farrar Straus Giroux.

Thaler, Richard (2015). *Misbehaving: The Making of Behavioral Economics*. W. W. Norton and Company.

[Business Cycles and stabilization policies \(MF\)](#)

Teacher:

Anne Epaulard (Université Paris-Dauphine, LEDa & PSL, France Stratégie)

Gauthier Vermandel (Université Paris-Dauphine, LEDa & PSL, France Stratégie)

Contact Information:

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Information on the course :

Semester 1

Course load: 27 hours, 9 sessions and of 3 hours per session

ECTS : 3

Overview:

The lectures provide insight into how to craft an optimal policy to stabilize an economy. Policymakers have several sets of policy instruments available to stabilize the business cycles of an economy and thus reduce the welfare cost of business cycles. These instruments are referred to as fiscal policy, monetary policy and macroprudential policies and can be employed to the stabilization of output, inflation and the financial system. The lecture aims at introducing how these instruments can be implemented optimally, and how these policy tools may have spillovers effects on one another.

The lectures offer an introduction to the derivation of a welfare criterion into a linear-quadratic framework to determine the optimal policy. These policy regimes can thus be ranked by comparing the utility level of each policy regime provided. Regarding fiscal policy, the lecture offer a discussion on the fiscal multipliers in DSGE models.

Prerequisites

Master 1 courses: Macroeconomics 1, Macroeconometrics 1 (semester 1); Macroeconomics 2

Master 2 courses: Bayesian techniques in macroeconomics (semester 1)

Course Objectives:

The objective of the course is to provide theoretical foundations of the design of optimal policies and discuss the effectiveness of stabilization policies (monetary policies, fiscal policies and macroprudential policies) in up to date New Keynesian Models. After having attended the classes, the students should be able to technically employ rational expectation model to determine an optimal policy, rank them using a welfare criterion, and discuss what are the determinants that make the policy (in)effective.

Mode of Assessment

Attendance, active participation, and assignments preparation prior to the lecture are strongly appreciated.

Planning / Course Schedule

1	An introduction to a linear quadratic framework in macroeconomics: derivation of a welfare criterion up to second order, the welfare cost of business cycles;
2	Monetary policy analysis: efficient frontier, stabilization trade-offs, sacrifice ratio between inflation and output stabilization
3	Monetary policy at the zero lower bound: occasionally binding constraint on the monetary policy rate. From a deterministic to a stochastic setup.
4	Macroprudential policy analysis and its interaction with monetary policy.
5	Macroprudential policies
6	Identification of fiscal policies shocks (Structural VAR and Narratives approaches) and the size of spending and tax multipliers
7	Fiscal Policies in RBC and standard DSGE models
8	Fiscal Policies in DSGE models: the role of preferences
9	Fiscal Policies in DSGE models at the Zero-Lower Bound

Readings

RBC and DSGE models and Policies:

<http://www.sipotra.it/wp-content/uploads/2017/05/DSGE-Models-in-the-Conduct-of-Policy-Use-as-intended.pdf>

Monetary Policy:

- Benigno, P., & Woodford, M. (2006). *Linear-quadratic approximation of optimal policy problems* (No. w12672). National Bureau of Economic Research.
- Benigno, P., & Woodford, M. (2012). Linear-quadratic approximation of optimal policy problems. *Journal of Economic Theory*, 147(1), 1-42.
- Benigno, G., Chen, H., Otrok, C., Rebucci, A., & Young, E. (2012). Optimal policy for macro-financial stability.
- Curdia, V., & Woodford, M. (2010). Credit spreads and monetary policy. *Journal of Money, credit and Banking*, 42, 3-35.
- Cúrdia, V., & Woodford, M. (2016). Credit frictions and optimal monetary policy. *Journal of Monetary Economics*, 84, 30-65.
- Lucas Jr, R. E. (2003). Macroeconomic priorities. *American economic review*, 93(1), 1-14.
- Schmitt-Grohé, S., & Uribe, M. (2004). Optimal fiscal and monetary policy under sticky prices. *Journal of economic Theory*, 114(2), 198-230.
- Schmitt-Grohé, S., & Uribe, M. (2007). Optimal simple and implementable monetary and fiscal rules. *Journal of monetary Economics*, 54(6), 1702-1725.
- Smets, F., & Wouters, R. (2003). An estimated dynamic stochastic general equilibrium model of the euro area. *Journal of the European economic association*, 1(5), 1123-1175.
- Smets, F., & Wouters, R. (2007). Shocks and frictions in US business cycles: A Bayesian DSGE approach. *American economic review*, 97(3), 586-606.
- Taylor, J. B. (1993, December). Discretion versus policy rules in practice. In *Carnegie-Rochester conference series on public policy* (Vol. 39, pp. 195-214). North-Holland.

Fiscal Policy

- Blanchard and Perroti, 2002, “An empirical Characterization of the dynamic effects of changes in government spending and taxes on output”, *Quarterly Journal of Economics*, n°114, pp.:1329 –1368.
- Christiano, Eichenbaum, and Rebelo, 2011, « When is the government spending multiplier large », *Journal of Political Economy*, 2011.
- Leeper, Traum and Walker, 2017, “Clearing Up the Fiscal Multiplier Morass”, *American Economic Review*, 107(8):2409-54
- Romer and Romer, 2010, “The macroeconomic effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks”, *American Economic Review* 100(6): 763-801.

Textbooks:

Galí, J. (2015). *Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications*. Princeton University Press.

McCandless, G. (2008). *The abcs of rbcs*. Cambridge, Massachusetts, London.

Woodford, M. (2003). *Interest rate and prices*.

Information Economics (THEO, SPP, MF)

Teacher:

Françoise Forges (Université Paris-Dauphine, LEDa & PSL Research University)

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Information on the course :

Semester 1

Course load: 36 hours, 12 sessions of 3 hours

ECTS : 6

Overview:

The course studies contractual relationships and resource allocation mechanisms among agents who have (i) different information on the basic economic situation at hand and (ii) different commitment power. Applications to auctions and regulation are considered.

Prerequisites

Standard microeconomic theory. Basic game theory.

Course Objectives:

After attending the classes, the students will master the modeling of informational asymmetries in various economic contexts. They will be able to rely on these models to address a number of questions dealing with allocation and regulation issues.

Mode of Assessment

10% participation + 90% written exam.

Planning / Course Schedule

1	Models of economic interaction under asymmetric information.
2	Signaling: game theoretic approach
3	Signaling: economic applications
4	Auctions: private values, revenue equivalence theorem
5	Auctions: common values (winner's curse)
6	Mechanism design: general framework, revelation principle
7	Efficient mechanisms (Holmström-Myerson, Vickrey-Clarke-Groves, Myerson-Satterthwaite, etc.)
8	Implementation
9	Contract theory in the light of mechanism design, application to optimal auction design
10	Contract theory: special topics, economic applications
11	Multi-agent, multi-principal problems
12	Multi-agent, multi-principal problems (continued)

Readings (short list)

- Bolton, P. and M. Dewatripont (2005), *Contract Theory*, Cambridge, MA: MIT Press.
- Krishna, V. (2010), *Auction Theory*, 2d edition, Academic Press.
- Laffont, J.J. and D. Martimort (2002), *The Theory of Incentives*, Princeton University Press.
- Mas-Colell, A., M. Whinston, and J. Green (1995), *Microeconomic Theory*, New York, Oxford University Press.
- Myerson R. (1981), “Optimal Auction Design”, *Mathematics of Operations Research* 6, 58–73.
- Myerson, R and M. Satterthwaite (1983), “Efficient Mechanisms for Bilateral Trading”, *Journal of Economic Theory* 29, 265–28.
- Vickrey, W. (1961). “Counterspeculation, Auctions, and Competitive Sealed Tenders”, *The Journal of Finance* 16, 8–37.

Development Microeconomics (SPP)

Teacher:

Philippe De Vreyer (University Paris-Dauphine, LEDa & PSL Research University)

Contact Information

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Information on the course :

Semester 1

Course load: 21 hours, in 7 sessions of 3 hours each. Teaching will be complemented with the readings of a short selection of research papers on which students may be tested.

ECTS : 3

Overview:

Beyond the obvious differences in standard of living, what distinguishes developing countries (DCs) from developed countries is the functioning of markets, which are more frequently failing in developing. Taking this into account is of primary importance to understand the behavior of households in developing countries and to design policies able to successfully fight against poverty. The course studies these issues both theoretically and empirically by addressing several topics in which they are relevant: Agricultural production and rural households; credit and insurance markets; intrahousehold decision making and inequality; fertility, demography and education; migration and transfers.

Prerequisites

Microeconomics, Microeconometrics

Course Objectives:

After attending the classes, the students will have a solid understanding of the main market failures in developing countries and how they shape the households' behaviors. A careful reading of

academic papers on these subjects will give them the most up-to-date research on these issues, and the appropriate tools to understand the policy implications.

Mode of Assessment

Classroom examination

Course Schedule

1	Introduction: what is development microeconomics about?
2	Market failures in developing countries: first insights using the agricultural household model as an example
3	Credit and insurance markets failures: implications on household behaviour, inequalities and adoption of innovations
4	Intrahousehold decision making and inequalities
5	Fertility, education, poverty and child labour
6	Migration and remittances

Readings

The papers that will be studied in class will be chosen in the list of main references that follows:

Becker G. (1962) Irrational Behavior and Economic Theory, *Journal of Political Economy*

De Vreyer, P. (2017) Measuring individual levels of consumption: a challenge for economic theory and data collection, *Dialogue* n°46 (<http://en.dial.ird.fr/content/view/full/46797>)

Rosenzweig M. (1988) Risk, Implicit Contracts and the Family in Rural Areas of Low Income Countries, *The Economic Journal*

Rossi P. (2018) Strategic Choices in Polygamous Households: Theory and Evidence from Senegal, *Review of Economic Studies*

Azam et Gubert (2002), Those in Kayes. The Impact of Remittances on Their Recipients in Africa, *Revue Economique*, 56(6), 2005, pp.1331-1358.

Banerjee and Newman (1993) Occupational Choice and the Process of Development, *Journal of Political Economy*

Barrett (1996), On price risk and the inverse farm size productivity relationship, *Journal of Development Economics*, vol51, n°2, pp193-215

Becker G. (1962) Irrational Behavior and Economic Theory, *Journal of Political Economy*

Becker and Lewis (1973), On the interaction between the quantity and quality of children, *Journal of Political Economy*, vol81, ppS279-S288

Beine, Docquier and Rapoport (2001), Brain Drain and Economic growth - Theory and Evidence, *Journal of Development Economics*, vol64, pp275-289

Besley (1995) Nonmarket institutions for credit and risk sharing in low-income countries, *Journal of Economic Perspectives*, 9 (3), 115-127

Besley, Coate and Loury (1993) The Economics of Rotating Savings and Credit Associations, *American Economic Review*, vol.83, n°4, pp. 792-811

Chiappori and Donni (2011) Non-unitary models of household behavior: a survey, in: A. Molina (eds), *Household Economic Behaviors*, Springer-Verlag New York Inc.

Deaton A. (1989) Looking or boy-girl discrimination in household expenditure data, *World Bank Economic Review*

Deaton Angus (1997), "Chapter 4: Nutrition, children, and intrahousehold allocation", in Angus Deaton , *The Analysis of Household Surveys. A Microeconomic Approach to Development Policy*, Baltimore: Johns Hopkins University Press

Dercon and Christiaensen (2011) Consumption risk, technology adoption and poverty traps - Evidence from Ethiopia, *Journal of Development Economics* vol.96, pp.159-173

De Vreyer, P. (2017), Measuring individual levels of consumption: a challenge for economic theory and data collection, *Dialogue* n°46 (<http://en.dial.ird.fr/content/view/full/46797>) De Vreyer, P and Lambert, S. (2017), By ignoring intra-household inequality do we underestimate the extent of poverty? DIAL WP 2017-05.

Duflo (2012) Women Empowerment and Economic Development, *Journal of Economic Literature*, vol. L

Duflo and Udry (2004), Intrahousehold resource allocation in Cote d'Ivoire - Social norms, separate accounts and consumption choices, NBER WP 10498

The Economics of Energy and the Environment (SPP)

Teacher:

Jan Horst Keppler (Université Paris-Dauphine, LEDa & PSL)

Contact Information

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Information on the course

Semester 1

Course load: 36h, 12 sessions, 3h per session

ECTS: 3

Overview:

The course will study the following topics: Externalities, Fixed Costs and Information; The Static Model of Optimal Internalization of Externalities (the Pigouvian approach); The Measurement of Externalities (abatement cost, loss of option value, the Coasean critique); Energy and Sustainable Development; Electricity Markets and the interaction of Carbon and Electricity Markets.

Prerequisites

Microeconomics, Industrial organization

Course Objectives:

The class will provide students with an overview of key concepts in both environmental economics and energy economics with a special focus on the performance of European electricity markets. The class will develop those notions in a framework alternating between private and social utility maximisation.

The class should enable students to apply the most important notions of environmental and energy economics to basic policy analysis.

Mode of Assessment

Written exam

Course Schedule

1	Externalities, Fixed Costs and Information Private and public goods Externalities Informational complexity and transaction costs The role of governments
2	The Static Model of Optimal Internalisation of Externalities I The Pigouvian approach Instruments for Internalisation The Working of Emissions Markets
3	The Static Model of Optimal Internalisation of Externalities III The distributional implications of the static model Grandfathering versus auctioning Risk, uncertainty and option value
4	The Measurement of Externalities I Measuring Abatement Cost Measuring Social Costs (including loss of option value)
5	The Measurement of Externalities II Distributional implications of environmental policies The Coasean critique (Coase against Coase) The Rebound Effect
6	Energy and Sustainable Development Sustainable development in the energy sector Energy efficiency and the rebound effect World energy perspectives
7	Electricity Markets The functioning of electricity markets and price formation The investment challenge and the capacity issue
8	Topics in electricity markets a. Projected costs of generating electricity b. Carbon pricing c. System effects
9	The Interaction of Carbon and Electricity Markets a. Theories of price formation in the carbon market b. Causality between CO ₂ prices and energy variables c. Rents of electricity producers due to carbon pricing

Bibliography:

Arrow, Kenneth J. (1970). "The Organization of Economic Activity: Issues Pertinent to the Choice of Market versus Non-Market Allocation", in Robert H. Haveman and J. Margolis (Eds.), *Public Expenditure and Policy Analysis*. Chicago.

Coase, Ronald H. (1960). "The Problem of Social Cost", *Journal of Law and Economics* 1(1): 1-21.

http://www.ecosystemvaluation.org/dollar_based.htm

Freeman, Myrick (1979). *The Benefits of Environmental Improvements: Theory and Practice*. Baltimore: Johns Hopkins University Press.

Joskow, Paul L. (2007), "Competitive Electricity Markets and Investment in New Generating Capacity", in Dieter Helm (ed.), *The New Energy Paradigm*, Oxford University Press, pp. 76-121 also at <http://economics.mit.edu/files/1190>.

Keppler, Jan Horst (2010). « Causalities between CO₂, Electricity, and other Energy Variables during Phase I and Phase II of the EU ETS » avec M. Mansanet-Batailler, *Energy Policy* 38(7): 3329-41.

Keppler, Jan Horst (2010). « The Impact of the EU ETS on Prices and Profits in the Electricity Sector » avec M. Cruciani, *Energy Policy* 38(8): 3280-90.

Keppler, Jan Horst (2010). « The Interaction Between the EU ETS Carbon Market and European Electricity Markets » in Ellerman D., Convery F. and de Perthuis C., *Pricing Carbon : The European Union Emissions Trading Scheme*, Cambridge University Press, Cambridge (UK), 2010, p. 293-328.

Keppler, Jan Horst (2010). « Going with Coase against Coase: The Dynamic Approach to the Internalization of External Effects », in *The Economics and Finance of Sustainable Development*, Economica, Paris, p. 118-139.

Keppler, Jan Horst (2000). « Prices, Technology Policy and the Rebound Effect » with F. Birol, *Energy Policy* 28 (6-7), p. 457-469.

Keppler, Jan Horst (1998). « Externalities, Fixed Costs and Information », *Kyklos* 52 (4), p. 547-563.

Pigou, Arthur Cecil (1932). *The Economics of Welfare*. London: Macmillan.

Stoft, Steven (2002), *Power System Economics*, Piscataway (NJ), IEEE Press.

[Empirical Industrial Organization \(THEO, SPP, MF\)](#)

Teacher:

Daniel Herrera (University Paris-Dauphine, LEDa & PSL)

Contact Information

Daniel Herrera: daniel.herrera@dauphine.psl.eu

Informations on the course :

Semester 1

Course load: 27h, 9 sessions; 3 hours per session

ECTS: 3

Overview:

In this course we will cover mainstream empirical industrial organization methods. The main goal is to provide a set of tools necessary to undertake empirical analyses typically performed in Empirical Industrial Organization. Most methods that will be reviewed in this course are not limited to empirical IO, but can be used in a variety of different fields (such as health, finance, and environmental economics).

The course will consider reduced-form estimation papers, seeking to provide insights from data to understand how markets work. The course will also deal with structural estimation of supply and demand models taking the theoretical models to the data with the objective of generating policy-relevant counterfactuals.

Reduced and structural econometrics methods requires the use of programs such as Stata or Matlab. Practical tutorials will ensure the implementation of the materials provided in the course.

Prerequisites

Master 1 courses: Industrial Organization; Advanced Industrial Organization; Microeconometrics
Basic knowledge of Stata and Matlab programming

Course Objectives:

The objective of the course is to provide the students with an appropriate understanding of key empirical industrial organization models.

After having attended the classes, the students will:

- have an overview of seminal and recent papers in empirical IO
- understand core empirical methods
- understand the data requirements for each method to be implemented
- have a working knowledge on Stata and Matlab

Mode of Assessment

There are 2 problem sets and 2 take homework assignments accounting for 70% of the mark. Presenting papers will account for the remaining 30%. By the end of each topic, students will be asked to read some of the remaining material (not covered in the course). Randomly selected students will make a one-hour presentation about the assigned paper. Also, during the course, two practical problem sets will be assigned. Randomly selected students will be asked to discuss their problem sets' solutions (codes and results).

There is no final exam.

Course topics

1	Introduction to empirical industrial organization - Meeting #1: assignment of problem set 1
2	Estimation of entry models and fixed costs - Meeting #2 - Meeting #3

	<ul style="list-style-type: none"> ○ students present topic 2 papers ○ students discuss solution of problem set 1 ○ assignment of problem set 2
3	<p>Estimation of demand and marginal costs</p> <ul style="list-style-type: none"> - Meeting #4 - Meeting #5 <ul style="list-style-type: none"> ○ assignment of take-home exam 1 - Meeting #6 <ul style="list-style-type: none"> ○ students present topic 3 papers ○ students discuss solution of problem set 2 •
4	<p>Consumer search and switching costs</p> <ul style="list-style-type: none"> - Meeting #7 - Meeting #8 <ul style="list-style-type: none"> ○ students present topic 4 papers ○ deadline take-home exam 1
5	<p>Estimation of bargaining models (if time allows)</p> <ul style="list-style-type: none"> - Meeting #9 <ul style="list-style-type: none"> ○ Assignment of take-home exam 2
	<p>Deadline for take-home exam 2: 3 weeks after the end of the course</p>

Readings

Introduction to empirical industrial organization

- [***] P. Reiss and F. Wolak, “Structural Econometric Modeling: Rationales and Examples from Industrial Organization,” Handbook of Econometrics, Volume 6A, Chapter 64, 2007, 4277–4314, Sections 1–4.
- [***] V. Aguirregabiria, “Empirical Industrial Organization: Models, Methods, and Applications,” Book in Progress, 2012, 1–23, Chapter 1.
- L. Einav and J. Levin, “Empirical Industrial Organization: A Progress Report,” Journal of Economic Perspectives, 2010.
- A. Nevo and M. Whinston, “Taking the Dogma Out of Econometrics: Structural Modeling and Credible Inference,” Journal of Economic Perspectives, 2010.
- J. Angrist and J. Pischke, “The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics,” Journal of Economic Perspectives, 2010.
- Edward Green and Robert Porter, “Non-cooperative Collusion Under Imperfect Price Information,” Econometrica, 52 (January 1984), pp. 87-100.

- Robert Porter, “A Study of Cartel Stability: The Joint Economic Committee, 1880-1886,” *Bell Journal of Economics*, 14 (Autumn 1983), pp. 301-314.
- Glenn Ellison, “Theories of Cartel Stability and the Joint Executive Committee,” *Rand Journal of Economics*, 25 (Spring 1994), pp. 37-57.
- Kenneth Hendricks and Robert Porter, “An Empirical Study of an Auction with Asymmetric Information,” *American Economic Review*, (December 1988), pp. 865-83.
- “Competition and Collusion in the American Automobile Industry: The 1955 Price War,” *Journal of Industrial Economics*, 35 (June 1987), 457-482.

Entry models and market structure: estimation of fixed costs

- [***] Berry, S., & Reiss, P. (2007). Empirical models of entry and market structure. *Handbook of industrial organization*, 3, 1845-1886.
- [***] T. Bresnahan and P. Reiss, “Econometric Models of Discrete Games,” *Journal of Econometrics*, 1991a.
- [***] T. Bresnahan, and P. Reiss, “Entry and Competition in Concentrated Markets,” *Journal of Political Economy*, 1991b.
- [***] S. Berry, “Estimation of a Model of Entry in the Airline Industry,” *Econometrica*, 1992.
- S. Berry and J. Waldfogel, “Free Entry and Social Inefficiency in Radio Broadcasting,” *RAND Journal of Economics*, 1999.
- O. Toivanen, and M. Waterson, “Market Structure and Entry: Where’s the Beef?” *RAND Journal of Economics*, 2005.
- K. Seim, “An Empirical Model of Firm Entry with Endogenous Product-Type Choices,” *RAND Journal of Economics*, 2006.
- Verboven, F., & Schaumans, C. Entry and competition in concentrated markets with product differentiation. *Review of Economics and Statistics*, 97(1), 195-209, 2015
- P. Jia, “What Happens When Wal-Mart Comes to Town: An Empirical Analysis of the Discount Retail Industry,” *EMA*, November 2008, 1263-316.
- M. Mazzeo, “Product Choice and Oligopoly Market Structure,” *RJE*, Summer 2002, 221-42.
- Schaumans, C. and F. Verboven (2008), "Entry and Regulation: Evidence from Health care Professions," *RAND Journal of Economics*, 39(4), pp. 949–972.

Estimation of demand and marginal costs

- [***] Steven T. Berry, “Estimating Discrete-Choice Models of Product Differentiation,” *Rand Journal of Economics*, 25, 242-262, 1994.
- [***] Berry, S., Levinsohn, J., & Pakes, A. (1995). Automobile prices in market equilibrium. *Econometrica: Journal of the Econometric Society*, 841-890.
- [***] A. Nevo, “Identification of the Oligopoly Solution Concept in a Differentiated-Products Industry,” *Economics Letters*, 1998.

- [***] Nevo, A. (2000). Mergers with differentiated products: The case of the ready-to-eat cereal industry. *The RAND Journal of Economics*, 395-421.
- [***] A. Nevo, "Empirical Models of Consumer Behavior," *Annual Review of Economics*, 2011.
- Berry, S., & Pakes, A. (2007). The pure characteristics demand model. *International Economic Review*, 48(4), 1193-1225
- Goldberg, P. K. (1995). Product differentiation and oligopoly in international markets: The case of the US automobile industry. *Econometrica: Journal of the Econometric Society*, 891-951
- A. Goolsbee and A. Petrin, "The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV," *Econometrica*, 2004.
- C. Knittel and K. Metaxoglou, "Estimation of Random-Coefficient Demand Models: Two Empiricists' Perspective," *The Review of Economics and Statistics*, 2014.
- A. Nevo, "A Practitioner's Guide to Estimation of Random-Coefficients Logit Models of Demand," *Journal of Economics & Management Strategy*, 2000b.
- A. Nevo, "Measuring Market Power in the Ready-To-Eat Cereal Industry," *Econometrica*, 2001.
- A. Petrin, "Quantifying the Benefits of New Products: The Case of the Minivan," *Journal of Political Economy*, 2002.
- A. Petrin and K. Train, "A Control Function Approach to Endogeneity in Consumer Choice Models," *Journal of Marketing Research*, 2010.
- M. Sovinsky Goeree, "Limited Information and Advertising in the U.S. Personal Computer Industry," *Econometrica*, 2008.
- G. Werden and L. Froeb, "The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy," *Journal of Law, Economics, & Organization*, 1994.

Estimation of bargaining models

- [***]Dube, Hitsch, Rossi (2010). State Dependence and Alternative Explanations for Consumer Inertia.
- [***]Honka, E. (2014), "Quantifying search and switching costs in the U.S. Auto Insurance Industry," *RAND Journal of Economics*, Vol. 45 (4), pp. 847-884.
- [***]Handel (2013, AER). Adverse selection and inertia in health insurance markets: When Nudging Hurts.
- Honka, E., A. Hortacsu, and M.A. Vitorino (2017), "Advertising, Consumer Awareness and Choice: Evidence from the U.S. Banking Industry," *RAND Journal of Economics*, Vol. 48 (3), pp. 611-646.
- De los Santos, B., A. Hortacsu, and M.R. Wildenbeest (2012), "Testing Models of Consumer Search using Data on Web Browsing and Purchasing Behavior," *American Economic Review*, Vol. 102 (6), pp. 2955-2980.
- Dube Hitsch, Rossi (2009). Do switching costs make markets less competitive.
- Miravete and Huerta (2014, ReStat). Consumer Inertia, Choice Dependence and Learning from Experience in a Repeated Decision Problem

- [***]Crawford, Gregory S., and Ali Yurukoglu. 2012. “The Welfare Effects of Bundling in Multichannel Television Markets.” *American Economic Review* 102 (2): 643–85.
- [***]Dafny, Leemore S. 2010. “Are Health Insurance Markets Competitive?” *American Economic Review* 100 (4): 1399–431
- Ho, Katherine, Justin Ho, and Julie Holland Mortimer. 2012. “The Use of Full-Line Forcing Contracts in the Video Rental Industry.” *American Economic Review* 102 (2): 686–719.
- Horn, Henrick, and Asher Wolinsky. 1988. “Bilateral Monopolies and Incentives for Merger.” *RAND Journal of Economics* 19 (3): 408–19.
- Grennan, M. (2013). Price discrimination and bargaining: Empirical evidence from medical devices. *American Economic Review*, 103(1), 145-77.

Health economics (THEO, SPP)

Teacher:

Florence Jusot, Université Paris Dauphine, LEDa & PSL University

Contact Information

florence.jusot@dauphine.psl.eu

Informations on the course :

Semester 1

Course load: 27h, 9 sessions of 3 hours per session

ECTS : 3

Overview:

This course aims at addressing the main issues in health economics in order to develop students’ awareness to understand current debates in the organization, the financing and the equity of health systems. We will first present the specificities of the demand for health and for preventive and curative health, the economics determinants of health and in particular the complex relationships existing between income, labor and health, and the determinants of health-related behaviors. Most attention will be paid on the relevance of incentives and on behavioral determinants. The second part of the course will address economics tools for the regulation of health system organization. We will present various concepts and tools used in order to assess equity in health, health care use and health system finance, in order to judge the efficiency of health strategy, and in order to evaluate health policies.

Prerequisites

Master 1 courses: Microeconomics 1, Microeconomics 2, Industrial organization

Course Objectives:

The objective of the course is to present the state of the art as concerns the treatment of the main current issues in health economics.

After having attended the classes, the students should be able to take up the reading of most research papers in health economics. They will be able to know how to gather sensible literature to write a comprehensive international survey on any policy question in health economics.

Mode of Assessment

One written final exam.

Planning / Course Schedule

1	Demand for health and for health care
2	Economic determinants of health: labor, income, health
3	Economics analysis of health-related behaviors
4	Equity in health, health care use and health care finance
5	Economic evaluation of health technologies: cost benefit analysis
6 – 7	Economic evaluation of health policies

[International Trade, International Macroeconomics \(MF\)](#)

Professor:

Gianluca Orefice, Professor, University Paris-Dauphine, LEDa & PSL Research University
Lise Patureau, Professor, University Paris-Dauphine, LEDa & PSL Research University

Contact Information

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Information on the course :

Semester 1

Course load: 27h, 9 sessions of 3 hours each

ECTS : 3

Overview:

The course is a topics course on international trade and macroeconomics, which covers the recent advances in international trade and macroeconomics with an emphasis on the role of firm heterogeneity. Starting from recent models of international trade with heterogeneous firms (Melitz 2003; Chaney 2008) and its effects on the labor market, the course will rely on the theoretical modelling of the New Open Economy Macroeconomy framework (Obstfeld & Rogoff, 1995), which embeds explicit microfoundations in a dynamic general equilibrium perspective. The first part of the course will provide students with the essential tools to study the optimal international strategy of firms with different levels of productivity. The second part of the course studies the recent advances in international macroeconomics that incorporate these elements from the

international trade literature, by modeling the role of the extensive margin of trade à la Melitz (2003) in an international macroeconomic setting.

Prerequisites

Master 1 : International Trade, Macroeconomics, macroeconometrics

Course Objectives:

The objective of the course is to introduce some key topics of interest in the field of international trade and international macroeconomics, and to provide students with the modelling framework to address them. In complement with the standard textbook, the students will be trained to read leading research articles on these issues.

After attending the classes, the students will have a decent understanding of the optimal international strategy of firm, and the intertemporal approach of the current account, and how to use it to address some key issues in international trade and macroeconomics. They will also master the cutting-edge research at the frontier between international macroeconomics and international trade, and how to think about economic policy in this global framework.

Mode of Assessment

Students will first be required to participate actively in class discussions (10% of the final grading). They will have to take a written exam at the end of the course (90%).

Course Schedule

<i>Part 1 – The New New Trade Theory and the Heterogeneity of firms</i>	
1	International Trade with Heterogeneous Firms (Melitz 2003) – closed economy
2	International Trade with Heterogeneous Firms (Melitz 2003) – open economy
3	Export vs. FDI with Heterogeneous Firms: Helpman, Melitz and Yeaple (2004)
4	Firm Heterogeneity and the role of fixed and variable trade cost (Chaney 2008)
5	Trade and labour market: a firm-based approach
<i>Part 2 – International Macroeconomics</i>	
6	The Intertemporal Approach to the Current Account
7	Nominal exchanges rates and international relative prices in the New Keynesian Open Economy setting
8	International macroeconomics & trade with producer dynamics
9	Trade, international relative prices and the exchange rate

Readings

Even though there is no textbook for this course, here are a few useful references:

- *Foundations of International Macroeconomics*, by Maurice Obstfeld and Kenneth Rogoff, MIT Press, October 1996
- *Exchange Rate Dynamics*, Martin Evans, Princeton University Press, 2011
- *Monetary Policy, Inflation, and the Business Cycle*, 2nd ed., Jordi Galí, Princeton University Press, 2015
- Melitz, M. (2003) “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity”, *Econometrica* 71: 1695-1725.
- Melitz, M., Helpman, H. and S. Yeaple (2004) “Export Versus FDI with Heterogeneous Firms”, *American Economic Review* 94: 300-316.
- Chaney, T. (2008) “Distorted Gravity: The Intensive and Extensive Margins of International Trade”, *American Economic Review*, 98(4): 1707-21

Articles: A list of readings will be provided for each topic – among them, a set of required readings, and a set of selected papers to be picked up for group presentation

Machine Learning (THEO, SPP, MF)

Teacher:

Fabrice Rossi (Université Paris-Dauphine & PSL Research University, CEREMADE)

Contact Information :

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Information on the course

Semester 1

Course Load: 36h, 12 sessions of 3 h each

ECTS: 6

Overview

This course provides a thorough introduction to machine learning covering both supervised and unsupervised learning. The first part of the course is dedicated to an introduction to supervised learning, i.e., situations in which a predictive model has to be constructed from a data set. This part introduces simple machine learning algorithms (k nearest neighbors and decision trees) and contrasts them with the standard linear model (used in e.g. econometrics). The key concepts of generalization and overfitting are presented, together with the resampling techniques used to properly tune complex models. The second part of the course focuses on advanced supervised learning methods including ensemble methods (random forests and boosting), kernel methods (support vector machines) and artificial neural networks (deep learning). The complex setting of unbalanced data is also covered in this part. Finally, the third part of the course is dedicated to unsupervised methods, with a particular focus on clustering techniques and on dimensionality reduction methods. Other aspects of unsupervised learning, such as frequent pattern mining and outlier detections are also discussed.

Course Objectives

The objective of the course is to introduce the methods of multidimensional descriptive data analysis for the processing of large datasets. The course is an applied one: all the methods are illustrated on real world data sets using python and its machine learning libraries. After attending the class, the students will know the main innovative techniques for the processing of large datasets and how to implement supervised machine learning, in view of applying these techniques to several economic issues.

Prerequisites :

Master 1 courses: Mathematical and statistical tools; Data management and programming. Practice of the Python language programming at basic level.

[Preference Modelling and Multiple Criteria Decision Making \(THEO, SPP\)](#)

Teacher:

Brice Mayag (Université Paris-Dauphine, LAMSADE & PSL Research University)

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Information on the course

Semester 1

Course Load: 15h

ECTS: 3

Overview

This course is an introduction to the main tools and techniques of preference modelling and multiple criteria decision making. The course will cover the following topics: Introduction to modelling for decision aiding and to Preference modelling; Social choice: introduction to social theory, voting rules and their properties; Multi-attribute Value Theory; ELECTRE methods: introduction to the ELECTRE methods.

Prerequisites

Mathematics and optimization, Statistics and probability at Master 1 level

Objectives:

After attending the classes, the students will have acquired a good knowledge of the concepts of preference modelling and elicitation techniques.

Course Schedule

1	Introduction to modelling for decision aiding: decision making process and decision aiding process
2	Preference modelling: main structure for preference modelling, numerical representations and classical problems
3	Social choice: introduction to social theory, voting rules and their properties

4	Multi-attribute Value Theory: even swap technique, additive value functions (mains results and elicitation)
5	ELECTRE methods: introduction to the ELECTRE methods.

Bibliography:

B. Roy et D. Bouyssou, Aide Multicritère à la Décision: Méthodes et Cas. Economica, Paris, 1993.

B. Roy, Méthodologie multicritère d'aide à la décision, Economica, Paris, 1985

Vincke Ph. (1989), L'Aide Multicritère à la Décision, Editions Editions Ellipses, Bruxelles.

Roubens, M. and Ph. Vincke (1985), Preference Modelling, Lecture Notes in Economics and Mathematical Systems n° 250, Springer Verlag, Berlin.

Sen A.K. (1986), Social choice theory, in K.J. Arrow and M.D. Intriligator (eds.), Handbook of Mathematical Economics III, North-Holland, Amsterdam, 1073-1181

French S. (1993) Decision Theory - An Introduction to the Mathematics of Rationality, Ellis Horwood, chapitre 4.

D. Bouyssou, Th. Marchant, M. Pirlot, P. Perny, A. Tsoukiàs, et Ph. Vincke. Evaluation and decision models: a critical perspective, Kluwer 2000.

Modelling in Decision Aiding and Operational Research (THEO, SPP)

Teacher:

Daniel Vanderpooten (Université Paris-Dauphine, LAMSADE & PSL)

Contact information : daniel.vanderpooten@dauphine.psl.eu

Information on the course

Semester 1

Couse load : 15h, 5 sessions, 3h per session

ECTS: 3

Overview

The course will introduce the students to the main models in decision aiding and operational research. After presenting the definition and roles of models in Decision Aiding/Operational Research, we will study the solution and preference models. We will then describe the modelling process and its different phases. The course will then introduce to non-trivial models using various modelling frameworks and the use of binary variables in linear programming. We will finish by studying the modelling and solving tools (modelers and solvers).

Prerequisites

Mathematics and optimization, Statistics and probability at Master 1 level

Objectives :

The course aims at presenting the modelling process in Decision Aiding/Operational Research as well as original models for various decision problems.

After attending the classes, the students will have a solid knowledge of some important points and techniques to undertake a decision support study.

Course schedule

1	Definition and roles of models in Decision Aiding/Operational Research. Solution and preference models.
2	Description of the modelling process and its different phases.
3	Presentation of non trivial models using various modelling frameworks (graphs, linear programming, multiobjective,...).
4	The use of 0-1 variables in linear programming
5	Presentation of modelling and solving tools (modellers and solvers).

Bibliography:

H.P. Williams. Model building in mathematical programming. J. Wiley, New York, 2013. 5th edition

Ph. Vallin et D. Vanderpooten. Aide à la décision : une approche par les cas. Ellipses, Paris, 2002., 2ème édition

D. Vanderpooten « Modelling in decision aiding ». In D. Bouyssou, E. Jacquet-Lagrèze, P. Perny, R. Slowinski, D. Vanderpooten, and Ph. Vincke (eds), Aiding Decisions with Multiple Criteria: Essays in Honour of Bernard Roy, pages 195–210. Kluwer, 2001.

Finance in continuous time (THEO, MF)

Professor:

René Aïd (Paris Dauphine University, LEDa & PSL Research University)

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Informations on the course :

Semester 1

Course load: 24 h (8 sessions, 3 hours each)

ECTS : 3

Overview:

Continuous-time modeling has taken a significant place in financial economics both from theoretical analysis of market equilibria and for management sciences. These lectures introduce stochastic calculus for two main applications, namely the pricing of contingent claims and the maximisation of intertemporal utility.

Prerequisites

Background in probability theory, differential calculus, ordinary differential equations, optimization.

Course Objectives:

The objective of the course is to make the students familiar with the fundamental techniques of stochastic calculus. After attending the classes, the students will master the tools of stochastic calculus which are required to address issues in financial economics and management science applications.

Mode of Assessment

Written exam.

Planning / Course Schedule

1	- Basic notion of probability theory
2	- The Brownian motion
3	- Stochastic integral and Itô's lemma (1/2)
4	- Stochastic integral and Itô's lemma (2/2)
5	- Black & Scholes model (1/2)
6	- Black & Scholes model (2/2)
7	- Intertemporel maximation of utility (1/2)
8	- Intertemporel maximation of utility (2/2)

Readings

- [1] Steven Shreve, Stochastic Calculus for Finance II: Continuous-time models. Springer. 2004.
- [2] Huyên Pham, Continuous-time Stochastic control and Optimization with Financial Applications. Springer. 2010.
- [3] Suresh P. Sethi and Gerald L. Thomson, Optimal Control Theory: Applications to Management Science and Economics. Springer. 2000.

Semester 2

Advanced Health economics (THEO, SPP)

Professor:

Brigitte Dormont, Université Paris Dauphine, LEDa & PSL University

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Informations on the course :

Semester 2

Course load: 18h, 6 sessions of 3 hours per session

ECTS : 3

Overview:

The course addresses the main issues in Health Economics at an advanced level: Design and regulation of health insurance (efficiency and coverage), Managed competition systems; The impact of health insurance on medical prices (coverage of demand, medical networks), Physician agency, Hospital competition under fixed prices and quality of care, Equity in Cost-Benefit Analysis.

These subjects are all linked to current policy questions in most countries: is it important for efficiency to put copayments in place, i.e. to limit coverage for an efficient use of healthcare? Are managed competition systems effective in promoting price competition between insurers, or do they encourage patient selection? Does supplementary health insurance encourage balance billing in France? Do medical networks implemented by some insurers contribute to limit prices? Is there a risk that hospital payment systems that are based on lump-sum payments per stay encourage a decrease in the quality of hospital care? How to introduce equity in cost-benefit Analysis? (Currently medical evaluation to decide on the reimbursements of medical innovations and pharmaceutical products are based on the cost per Qaly, which raises ethical concerns because individual preferences and impacts on redistribution are not taken into account.)

Prerequisites

Course of M2 semester 1: Health economics

Courses in Master 1 : Microeconomics 1 & 2, Industrial organization

Course Objectives:

The objective of the course is to present the state of the art as concerns the treatment of the main current issues in health economics.

After having attended the classes, the students should be able to take up the reading of most research papers in health economics. They will be able to know how to gather sensible literature to write a comprehensive international survey on any policy question in health economics.

Mode of Assessment

One written exam.

Course Schedule

1	Design and regulation of health insurance
2	Managed competition systems
3	The impact of health insurance on medical prices
4	Physician agency
5	Hospital competition and quality of care
6	Equity in Cost-Benefit Analysis

Readings

- Health Care Spending Risk, Health Insurance, and Payment to Health Plans, (2012), Friedrich Breyer, M. Kate Bundorf and Mark V. Pauly, in *Handbook of Health Economics*, Volume 2
- Physician agency, (2000), McGuire TG. In *The Handbook of Health Economics*, Culyer AJ, Newhouse JP (eds), North-Holland: Amsterdam, 2000; 461–536
- Demand for Health Insurance, (2012) T. G. McGuire, in *Handbook of Health Economics*, Volume 2.
- Does health insurance encourage the rise in medical prices?, A test on balance billing in France, Brigitte Dormont and Mathilde Peron *Health Economics*, Volume 25, Issue 9, September 2016, pp. 1073-1089
- Competition between hospitals. Does it affect quality of care ?, (2018) Brigitte Dormont & Carine Milcent co-editors, CEPREMAP, Editions Rue d'Ulm, novembre 2018
- Rebuilding the Health Insurance System, Dormont B., Geoffard P.-Y., Tirole J.. (2014), Les notes du Conseil d'Analyse Economique, n°12, avril

[Advanced Macroeconomics: Frictions and policies \(MF\)](#)

Teacher:

Lise Patureau (Université Paris-Dauphine, LEDa & PSL Research University)

Gauthier Vermandel (Université Paris-Dauphine, LEDa & PSL Research University, France Stratégie)

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Information on the course :

Semester 2

Course load: 18 hours, 6 sessions, 3 hours per session

ECTS : 3

Overview:

The standard real business cycles model features a reduced form for both financial and labor markets. The main of these lectures is to present the recent set of frictions on the labor and financial markets that extend the benchmark RBC model, and thus allowing the latter to reproduce the dynamics of loans, employment rate, asset prices into a rational expectations model.

The lectures are thus split in two parts:

Part I. Topics in Monetary policy: this first part aims at introducing frictions into the monetary system. The starting point of the lecture is cash-in-advance constraints, and then are continued to more elaborate financial frictions models from collateral constraints to the financial accelerator model.

Part II: Macroeconomics of the labour market. In the second part of the course, we will study the recent development in the macroeconomics of the labour market that includes search and matching labour market frictions in a dynamic general equilibrium setting. In complement with the presentation made in the reference textbook, we will study some leading research articles that embed search and matching frictions in the DSGE approach, and how to think about labor market policies in this setting.

Prerequisite

A solid background in both micro and macro is a pre-requisite.

The course in Business Cycles Stabilization and Policies (Master 2, Semester 1) is a pre-requisite, as this lecture is a direct extension to macroeconomic stabilization.

Course Objectives:

The objective of the course is to provide a presentation of the role of frictions on financial and labor markets on the cyclical behaviors of the main macroeconomic variables, and the induced consequence for the stabilization policy.

After having attended the classes, students will know how to include financial frictions to determine the dynamics of loans and asset prices of the economy. On both issues, a careful reading of academic papers will give them the most up-to-date research on the topic, and the appropriate tools to understand the relevant policy implications.

Mode of Assessment

Attendance, active participation, and assignments preparation prior to the lectures are strongly appreciated. In addition, the main assessment of this course is based on a 30-page project.

Course Schedule

1	Money in macroeconomic models, seigniorage and the use of monetary base as a macroeconomic tool ('helicopter money').
2	Borrowing constraints on collateral for housing and the industrial loans markets. Occasionally binding constraints with non-linear methods.

3	Costly state verification and the financial accelerator: endogenous default, external finance premium and risk shocks.
4	Labour market search and matching frictions and unemployment rate fluctuations
5	Labour market policies and employment fluctuations
6	International trade and labor market frictions

Readings

Articles: Here is a non-exhaustive list of papers that we will cover

Part I: Topics on Monetary policy

- Bernanke, B., Gertler, M., & Gilchrist, S. (1994). *The financial accelerator and the flight to quality* (No. w4789). National Bureau of Economic Research.
- Bernanke, B. S., Gertler, M., & Gilchrist, S. (1999). The financial accelerator in a quantitative business cycle framework. *Handbook of macroeconomics, 1*, 1341-1393.
- Christiano, L. J., Motto, R., & Rostagno, M. (2014). Risk shocks. *American Economic Review, 104*(1), 27-65.
- Gertler, M., Gilchrist, S., & Natalucci, F. M. (2007). External constraints on monetary policy and the financial accelerator. *Journal of Money, Credit and Banking, 39*(2-3), 295-330.
- Guerrieri, L., & Iacoviello, M. (2017). Collateral constraints and macroeconomic asymmetries. *Journal of Monetary Economics, 90*, 28-49.
- Iacoviello, M. (2005). House prices, borrowing constraints, and monetary policy in the business cycle. *American economic review, 95*(3), 739-764.
- Iacoviello, M. (2015). Financial business cycles. *Review of Economic Dynamics, 18*(1), 140-163.
- Lucas Jr, R. E., & Stokey, N. (1985). Money and interest in a cash-in-advance economy.

Part II: Macroeconomics of the labour market

- Blanchard, O. & Giavazzi, F. (2003). Macroeconomic effects of regulation and deregulation in goods and labor markets. *The Quarterly Journal of Economics, 118*(3), pp. 879-907.
- Cacciatore, M. & Fiori, G. (2016). The macroeconomic effects of good and labor markets deregulation. *Review of Economic Dynamics, 20*, pp. 1-24.
- Cacciatore, M., Fiori, G., & Ghironi, F. (2016). Market deregulation and optimal monetary policy in a monetary union. *Journal of International Economics, 99*, 120–137.
- Helpman, E. & O. Itskhoki (2010): Labour market rigidities, Trade and Unemployment, *Review of Economic Studies 77*, 1100-1137.

Textbooks:

- Galí, J. (2015). *Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications*. Princeton University Press.
- McCandless, G. (2008). *The abcs of rbc's*. Cambridge, Massachusetts, London.
- Woodford, M. (2003). *Interest rate and prices*.
- Cahuc, Pierre, Carcillo, Stéphane and André Zylberberg, 2014, *Labour Economics*, 2nd edition, MIT Press.

Banking Economics (MF)

Professor:

Mariana ROJAS-BREU (Université Paris Dauphine, LEDa & PSL)

Contact Information

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Informations on the course :

Semester 2

Course load: 18 hours, 6 sessions, 3 hours per session

ECTS : 3

Overview:

The course develops the theory of banking and financial intermediation. It starts by reviewing basic concepts in financial and banking economics. What are financial intermediaries and what is their role in the economy? Why are banks special? The course then presents formal frameworks for the analysis of the banking system, financial fragility and the occurrence of financial crises, as well as the policy responses to financial fragility (suspension of convertibility, deposit insurance, narrow banking, bailouts). The course provides the tools to examine important aspects of the design and implementation of banking regulation. Topics that will be reviewed include the role of asymmetric information, the types of banking regulation, the role of deposit insurance and capital requirements, the lender-of-last-resort function of the central bank, the role of market discipline.

Prerequisites

Basic microeconomic knowledge (calculus and basic notions of optimization theory).

Course Objectives:

The course will allow students to get familiar with formal tools for the analysis of the economics of banking and financial regulation. Students will be confronted with real-world examples of banking regulation and will gain understanding on important issues that have been at the center of the policy debate over the last years, such as the on- and off-balance sheet activities of financial institutions, the separation of banking and other financial industries, and contagion across financial institutions.

Mode of Assessment

Class presentation (50%)

Referee report (50%)

Planning / Course Schedule

1	Basic concepts in banking economics. A model of liquidity insurance: the Diamond-Dybvig model. The market solution vs. the banking arrangement. Optimal allocation under the fractional reserve banking system (FRBS). Bank runs and bank panics.
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2	Solutions to the instability of the FRBS. Narrow banking, suspension of convertibility, deposit insurance, lender of last resort. The role of the interbank market. The Bhattacharya-Gale model.
3	Optimal regulation. The justification for (and the costs of) banking regulation. Deposit insurance and moral hazard. Liquidity regulations. Solvency regulations.
4	Intermediation and crises. Beliefs-based vs. fundamental banking crises. Financial fragility: liquidity provision, fire sales and bankruptcies under incomplete markets. The resolution of bank failures. Bail-ins and bail-outs.
5	Banking crises and bubbles. Optimal monetary policy. Financial contagion.
6	Bank deregulation. Shadow banking.

Readings

The course follows specific chapters of:

Freixas, X. and J.C. Rochet, 2008. *Microeconomics of banking*, 2nd ed., Cambridge, MA: MIT Press.

Allen, F. and D. Gale, 2007. *Understanding financial crises*, New York: Oxford University Press. Selected articles

The contents of the course are enriched with a number of academic articles that we will discuss in class:

Allen, F. and D. Gale, 1998. "Optimal financial crises". *Journal of Finance* 53, 1245-1284.

Allen, F. and D. Gale, 2000. "Financial contagion". *Journal of Political Economy* 108: 1-33.

Bhattacharya, S. and D. Gale, 1987. Preference shocks, liquidity and central bank policy. In *New approaches to monetary economics*, ed. W. Barnett and K. Singleton. Cambridge: Cambridge University Press.

Boot, A. and A. V. Thakor, 1997. "Banking scope and financial innovation". *Review of Financial Studies* 10, 1099-1131.

Calomiris, C. and C. Khan, 1991. "The role of demandable debt in structuring optimal banking arrangements". *American Economic Review* 81, 497-513.

Cooper, R. and T. Ross, 2002. "Bank runs: deposit insurance and capital requirements". *International Economic Review* 43, 55-72.

Dewatripont, M. and J. Tirole, 1993. Efficient governance structure: Implications for banking regulation. In *Capital markets and financial intermediation*, ed. C. Mayer and X. Vives. Cambridge: Cambridge University Press.

Diamond, P. and P. Dybvig, 1983. "Bank Runs, Deposit Insurance, and Liquidity". *Journal of Political Economy* 91, 401-419.

Diamond, D. and G. Rajan, 2001. "Liquidity risk, liquidity creation and financial fragility: A theory of banking". *Journal of Political Economy* 109, 287-327.

Diamond, D. and G. Rajan, 2005. "Liquidity shortage and banking crises". *Journal of Finance* 60, 615-647.

Ennis, H. and T. Keister, 2009. "Bank runs and institutions: the perils of intervention." *American Economic Review* 99, 1588-1607.

Farhi, E., M. Golosov, and A. Tsyvinski, 2009. "A theory of liquidity and regulation of financial intermediation." *Review of Economic Studies* 76, 973-992.

Fahri, E. and J. Tirole, 2017. "Shadow banking and the four pillars of traditional financial intermediation". Working Paper.

Gorton, G. and G. Pennacchi, 1990. "Financial intermediaries and liquidity creation". *Journal of Finance* 45, 49-71.
Keister, T., 2016. "Bailouts and financial fragility". *Review of Economic Studies* 83, 704-736.
Rochet, J.C. and X. Vives, 2004. "Coordination failures and the lender of last resort: was Bagehot right after all?" *Journal of the European Economic Association* 2, 1116-1147.

Individual and collective decisions (THEO, SPP)

Professor:

Jean-Philippe Lefort (Université Paris-Dauphine, LEDa & PSL)
Remzi Sanver (University Paris-Dauphine, LAMSADE & PSL)
Sidartha Gordon (Université Paris-Dauphine, LEDa & PSL)

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Information on the course :

Semester 2
Course load: 24 hours (8 sessions of 3 hours)
ECTS: 3

Overview:

The course investigates the process of decision making, both at an individual and collective level. It is organised in three parts. It starts with the analysis of individual decision making. The analysis of collective decision making comes as a natural extension: What if there are several individuals with conflicting preferences who, nevertheless, have to choose an option which will be common to all of them? This raises the problem of aggregating individual preferences into a collective one. This drives us to introduce fundamental concepts and results on preference aggregation, with particular emphasis on the majority rule and Arrow's Impossibility Theorem. The third part covers recent developments on the allocation of resources on markets not necessarily governed by prices, with an emphasis on the allocation of human organs to patients and the allocation of public-school places to children through centralized mechanisms

Prerequisites

Game Theory, Microeconomics

Course Objectives:

The objective of the course is to present the fundamentals of decision making both at an individual and collective level. The students will have a good understanding of

- standard models of individual decision making;
- how to analyse an individual decision-making problem within a given model;
- standard models of collective decision making;

- axiomatic approach to collective decision making;
- how to allocate resources when markets be designed when they are not governed by prices

After having attended the classes, the students should be able to address theoretical and applied problems in those fields and to come up with their own research questions in these areas.

Mode of assessment

Final exam 95%

In-class participation 5%.

Planning / Course Schedule

1	What is a rational economic agent? Utility paradigm, Debreu gap lemma.
2	Revealed preference theorem: Afriat theorem, and recent extensions. Risk and uncertainty framework
3	Behavioral approach, expected utility and subjective expected utility. Non-expected utility approaches
4	We present the preference aggregation problem. For the particular case of two alternatives, we state and prove the characterization of the majority rule by May (1952). For the general case with at least three alternatives, we make a complete statement of Arrow's (1963) impossibility theorem.
5	We present one of the proofs of Arrow's impossibility theorem (Mas Colell et al. (1995)). We also discuss ways to escape this negative result via weakening the conditions which lead to the impossibility.
6	Cooperative bargaining (nontransferable utility): Nash bargaining, Kalai and Smorodinsky solution. Games in characteristic function form (possibly with nontransferable utility), core, Shapley value.
7	House Allocation and Housing Markets: deterministic mechanisms
8	Introduction to two-sided matching

References

- Arrow, K. J., 1963, *Social Choice and Individual Values*, 2nd edition, John Wiley and Sons, New York.
- Binmore, K., 2008, *Rational decisions*, Princeton University Press, NJ.
- Gaertner, W., 2009. *A primer in social choice theory: Revised edition*. Oxford University Press.
- Gibbard, A., 1973, Manipulation of voting schemes: a general result, *Econometrica*, 41, 587-601.
- Gilboa I. 2018, *Rational choice*, MIT press.
- Mas Colell, A., M.D. Whinston, J.R. Green, 1995, *Microeconomic Theory*, Oxford University Press.
- May, K., 1952, A set of independent, necessary and sufficient conditions for simple majority decision. *Econometrica* 20, 680-684.

- M.A. Satterthwaite, MA, 1975, Strategy-proofness and Arrow's conditions: existence and correspondence theorems for voting procedures and social welfare functions, *Journal of Economic Theory*, 10, 187-217.
- Wakker, P., 2010, *Prospect theory for risk and ambiguity*, Cambridge University Press
- Roth, A. and M. Sotomayor: *Two-sided matching - A study in game-theoretic modeling and analysis*. Cambridge University Press. 1990.
- Roth, A. (2008), Deferred acceptance algorithms: history, theory, practice, and open questions, *International Journal of Game Theory* 36(3), 537-569.
- Sonmez, T. and U. Unver: *Matching, allocation, and exchange of discrete resources*. Chapter 17 in *Handbook of Social Economics* (volume 1). North-Holland. 2010.
- *The Handbook of Market Design*. Oxford University Press. 2013

List of selected articles

For the topic *House Allocation and Housing Markets: deterministic mechanisms*

- Shapley and Scarf (1974) On cores and indivisibility, *Journal of Mathematical Economics*.
- Roth and Postlewaite (1977) Weak versus strong domination in a market with indivisible goods. *Journal of Mathematical Economics*.
- Hylland and Zeckhauser (1977) The efficient allocation of individuals to positions, *Journal of Political Economy*.
- Roth (1982) Incentive compatibility in a market with indivisible goods, *Econom. Letters*.
- Ma (1994) Strategy-Proofness and the Strict Core in a Market with Indivisibilities. *International Journal of Game Theory*.
- Papai (2000) Strategy-proof Assignment by Hierarchical Exchange, *Econometrica*.
- Abdulkadiroglu and Sönmez (1999) House allocation with existing tenants, *Journal of Economic Theory*.
- Sönmez and Unver (2005) House Allocation with Existing Tenants: An Equivalence, *Games and Economic Behavior*.

For the topic: *Introduction to two-sided matching*

- Gale and Shapley (1962) College admissions and the stability of marriage, *American Mathematical Monthly*.
- Shapley and Shubik (1972) The assignment game I: the core, *International Journal of Game Theory*.
- Roth (1982) The economics of matching: stability and incentives, *Mathematics of Operations Research*.
- Dubins and Freedman (1981) Machiavelli and the Gale-Shapley algorithm, *American Mathematical Monthly*. Roth (1984) The evolution of the labor market for medical interns and residents: A case study in game theory, *Journal of Political Economy*.

[Policies in developing countries \(SPP\)](#)

Professor:

Olivia Bertelli (Université Paris-Dauphine, LEDa & PSL)

Véronique Gille (IRD, Université Paris-Dauphine, LEDa & PSL)

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Information on the course :

Semester 2

Course load: 21h, 7 sessions and of 3 hours per session

ECTS : 3

Overview:

The very large efforts carried out by countries and international organizations to increase income and fight poverty have been unequally successful. While some countries have seen impressive growth in the last 30 years, 736 million people were still leaving in extreme poverty as of 2015. This observation raises questions about policies that we discuss in this course. It is divided in two parts. **The first part of** the course analyses impact evaluations of public policies tackling the constraints to human and economic development tied to education, health, gender and agriculture in developing countries. **The second part provides** insights into social policies in developing countries, with a focus on the instruments and the political economy of the implementation of policies.

Prerequisites

The class will sometimes get technical regarding the econometric methods adopted in the papers. We will discuss key methods along with the papers applying them. We expect the students to be familiar with panel estimation methods and IV methods, which can be read up in the following references:

- Wooldridge, J. M. (2009). Introductory Econometrics. Mason (Cengage Learning Services).
- Kennedy, P. (2003): A Guide to Econometrics, 5th edition, Malden (Blackwell). [less math]

Course Objectives:

The overall objectives of this course are to provide students with an overview of policies in developing countries, with a focus on the different types of instruments and the political economy of policy implementation. It will also discuss the impacts of education, health, gender and agricultural policies in developing countries.

The course is based on contemporary research, that the students will be required to read and that we will discuss in class. After having attended the classes, the students will therefore understand the main challenges related to policies in developing countries and know what the most recent evolutions in this literature are. They will also be able to critically assess research work.

Mode of Assessment

10% Participation, 90 % Written exam

Planning / Course Schedule

The course will cover the following topics

1. Health economics: how to improve the health conditions of people in developing countries?
2. Education economics: how to increase human capital?
3. Gender economics: how to improve gender equity?

4. Agriculture economics: how to boost agricultural production?
5. Conditional cash transfers and microfinance as development tools: what works?
6. The political economy of policies: clientelism and corruption; leaders identity and preferences

Readings (not exhaustive list)

All readings will be available on MyCourse. This is a not exhaustive list of the papers that will be discussed in class.

- Acemoglu, Daron, and Simon Johnson. "Disease and development: the effect of life expectancy on economic growth." *Journal of political Economy* 115.6 (2007): 925-985.
- Baird, Sarah, Craig McIntosh, and Berk Özler. "Cash or condition? Evidence from a cash transfer experiment." *The Quarterly journal of economics* 126.4 (2011): 1709-1753.
- Behrman, Jere R., Susan W. Parker, and Petra E. Todd. "Do conditional cash transfers for schooling generate lasting benefits? A five-year follow-up of PROGRESA/Oportunidades." *Journal of Human Resources* 46, no. 1 (2011): 93-122.
- BenYishay, Ariel, and A. Mushfiq Mobarak (2019) "Social learning and incentives for experimentation and communication." *The Review of Economic Studies* 86.3: 976-1009.
- Besley, T., Pande, R., Rahman, L., & Rao, V. (2004). The politics of public good provision: Evidence from Indian local governments. *Journal of the European Economic Association*, 2, 416–426.
- Buckley, Graeme. "Microfinance in Africa: Is it either the problem or the solution?" *World Development* 25, no. 7 (1997): 1081-1093.
- Chattopadhyay, R., & Duflo, E., 2004. Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica*, 72(5), 1409-1443.
- Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F. Halsey Rogers (2006) "Missing in action: teacher and health worker absence in developing countries." *The Journal of Economic Perspectives* 20, no. 1: 91-116.
- Cohen, Jessica, and Pascaline Dupas (2010) "Free distribution or cost-sharing? Evidence from a randomized malaria prevention experiment." *Quarterly journal of Economics* 125.1: 1.
- Duflo, Esther (2001) "Schooling and labor market consequences of school construction in Indonesia: Evidence from an unusual policy experiment." *American economic review* 91.4: 795-813.
- Duflo, Esther (2012) "Women empowerment and economic development", *Journal of Economic Literature*, vol.50 n.4: 1051-1079
- Duflo, Esther, Pascaline Dupas, and Michael Kremer (2015), "School governance, teacher incentives, and pupil-teacher ratios: Experimental evidence from Kenyan primary schools", *Journal of Public Economics*, 123 : 92–110
- Dupas, Pascaline. "What matters (and what does not) in households' decision to invest in malaria prevention?" *The American Economic Review* (2009): 224-230.
- Lehne, L., Shapiro, J.N, Vanden Eynde, O. (2018). Building connections: Political corruption and road construction in India. *Journal of Development Economics*, 131(March), 62-78.

- Miguel, Edward, and Michael Kremer. "Worms: identifying impacts on education and health in the presence of treatment externalities." *Econometrica* 72.1 (2004): 159-217.
- Mammen, K. and Paxson, C. (2000) "Women's work and economic development", *Journal of Economic Perspectives*, vol.14 n.4: 141-164
- Qian, Nancy (2008) "Missing women and the price of tea in China: The effect of sex-specific earnings on sex imbalance." *The Quarterly Journal of Economics* 123.3: 1251-1285.
- Timmer, C. Peter (2002) "Agriculture and economic development." *Handbook of agricultural economics* 2: 1487-1546.

Research Methods in Monetary Economics (MF)

Teacher:

Richard DUTU (Université Paris Dauphine, LEDa & PSL Research University) & Mariana ROJAS-BREU (Université Paris Dauphine, LEDa & PSL Research University)

Contact Information

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Information on the course :

Semester 2

Course load: 18 hours, 6 sessions and 3 hours per session

ECTS : 3

Overview:

The goal of this course is to train students to modern research methods in monetary economics and policy. The course starts with a review of the main macroeconomic models of money (MIU, CIA, NK-DSGE). The rest of the course is then dedicated to a hands-on presentation of the New Monetarist framework where the frictions that give rise to money and credit are explicitly modeled, thereby creating a natural environment to understand the role of money, credit and intermediation. The course presents the main financial and trade frictions (private information, limited commitment, search) that are key to the concepts of money and liquidity. The formal framework is then applied to a range of important topics, such as the relationships among liquidity, asset prices, monetary policy, the dynamics of over-the-counter markets, crypto-currencies and cashless economies.

Prerequisites

Master 1 courses: Mathematical and statistical tools, Macroeconomics 1, Macroeconomics 2

Course Objectives:

The course will allow students to get familiar with state-of-the-art monetary theory and acquire key research tools and models in monetary and financial economics.

After attending the classes, the students will have a solid knowledge of a wide range of classic and timely issues in monetary theory and policy, such as the interplay between money and credit, optimal monetary policies, monetary unions, over-the-counter markets, and crypto-currencies.

Mode of Assessment

Class presentation (50%)

Referee report (50%)

Planning / Course Schedule

1	Introduction to 1) the economics of money, liquidity and payments;; 2) existing ad-hoc models of money (MIU, CIA); 3) dynamic programming.
2	Search and matching monetary models of first and second generation. Types of monetary equilibria and non-monetary equilibria.
3	The Lagos-Wright model for monetary theory and policy. Pricing mechanisms (competitive pricing, bargaining). Calibration and policy experiments in monetary search models.
4	Monetary models with bank credit, default and asset markets.
5	Applications I. Liquidity, asset prices, and monetary policy. Liquidity traps. Scarcity of safe assets. Open-market operations. Non-conventional monetary policies.
6	Applications II. Crashes and recoveries in over-the-counter markets. Monetary unions. Criptocurrencies and central-bank digital currencies.

Readings

- Ricardo Lagos & Guillaume Rocheteau & Randall Wright, 2017. « Liquidity: A New Monetarist Perspective », Journal of Economic Literature, American Economic Association, vol. 55(2), 371-440
- Williamson and Wright (2010a,2010b), FRB Minneapolis, « New Monetarist Economics: Methods », « New Monetarist Economics: Models »
- Lagos and Wright, 2005: « A Unified Framework for Monetary Theory and Policy Analysis », JPE 113, 463-484. The workhorse model in NME.
- Shi (2006), « Viewpoint: A microfoundation of monetary economics », CJE 39.
- Aleksander Berentsen & Gabriele Camera & Christopher Waller, 2007. “Money, Credit and Banking”. JET 135, 171-195

Further readings given depending on the topic being covered.

[Transport and variational problems in economics \(THEO\)](#)

Teacher:

Guillaume Carlier (University Paris-Dauphine, CEREMADE & PSL Research University)

Contact:

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Information on the course

Semester 2

Course Load: 15h

ECTS: 3

Overview

In this course after introducing tools from convex duality and optimal transport we will see how they can be used in various problems in economics such as matching, congestion games and congested transport, principal-agent problems, urban economics, ...

Objectives of the course

The course is a topics course at the frontier of mathematics and microeconomics. It aims at presenting the basics of the mathematical theory of optimal transportation and how it can be applied in various economic contexts.

After attending the classes, the students will be able to address the mathematical theory of optimal transport and make use of it to have an in-depth analysis of related applied economic issues.

[Research seminars \(Semester 2\)](#)

[Research seminar: Topics in Health and Ageing \(SPP\)](#)

Professor:

Eric Bonsang (Université Paris-Dauphine, LEDa & PSL University) and Brigitte Dormont (Université Paris-Dauphine, LEDa & PSL University)

Contact Information

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Brigitte Dormont: brigitte.dormont@dauphine.psl.eu

Informations on the course :

Semester 2

Course load: 18h, 6 sessions and 3 of hours per session

ECTS : 3

Overview:

This seminar is aimed to provide students with key skills in terms of research paper writing, while at the same time build their knowledge of the most important issues in Health and Ageing. The seminar is divided in 6 three-hour sessions.

During the first session, after a brief presentation of the various themes that will be treated during the seminar, the remaining time will be devoted to an explanation of what is expected from

researchers when they conduct empirical research in economics. The following questions will be examined: how to provide credible empirical evidence in economics, write a paper, how to structure a presentation using powerpoint or an equivalent software.

The remaining sessions will be devoted to the critical assessment of articles recently published in top journals in the fields of Health and Ageing economics. Each paper will be presented by one student and up to three students will act as “referees”, who will have to discuss the presentation and the paper itself.

Prerequisites

Good knowledge of econometrics on micro data.

Course Objectives:

The objective of the course is to get students familiar with the main issues in Health Economics, and the main challenges of population ageing. The course will cover the recent empirical studies that approach these topics by using advanced econometric methods.

Possible topics are the following:

- The effects of retirement on health
- Causes and consequences of cognitive ageing
- Long-term care and long-term care insurance
- Health insurance: Impact of on medical prices and access to care
- Competition in health insurance and supplementary health insurance
- Hospital heterogeneity in hospital payment systems

Mode of Assessment

The grade is based on oral participation and the writing of your analysis of the selected article and the reports on other presentations. No final exam is organized.

Planning / Course Schedule

1. Introduction
2. Topics in Ageing (Sessions 2-3)
3. Topics in Health (Sessions 4-6)

Readings

Readings will be based on recent publications in top journals in Health Economics and in the Economics of Ageing

[Research seminar : Topics in Macroeconomics and Finance \(MF\)](#)

Professor:

Anne Epaulard (Université Paris-Dauphine, LEDa & PSL University, France Stratégie) and Richard Dutu (Université Paris-Dauphine, LEDa & PSL University)

Contact Information

Anne Epaulard: anne.epaulard@dauphine.psl.eu

Richard Dutu: richard.dutu@dauphine.psl.eu

Informations on the course :

Semester 2

Course load: 18h, 6 sessions and 3 of hours per session

ECTS : 3

Overview:

This seminar is aimed to provide students with key skills in terms of research paper writing, while at the same time build their knowledge of the most important issues in Macroeconomics and Finance. The seminar is divided in 6 three-hour sessions.

During the first session, after a brief presentation of the various themes that will be treated during the seminar, the remaining time will be devoted to an explanation of what is expected from researchers when they conduct empirical research in economics. The following questions will be examined: how to provide credible empirical evidence in economics, write a paper, how to structure a presentation using powerpoint or an equivalent software.

The remaining sessions will be devoted to the critical assessment of articles recently published in top journals in the fields of Macroeconomics, Monetary Economics and Macrofinance. Each paper will be presented by one student and up to three students will act as “referees”, who will have to discuss the presentation and the paper itself.

Prerequisites

Advanced macroeconomics, macroeconometrics, monetary economics

Course Objectives:

The objective of the course is to get students familiar with the main issues in macroeconomics, in special connexion with monetary and banking economics, and the financial area. The course will cover the recent empirical studies that approach these topics by using advanced econometric methods.

Mode of Assessment

The grade is based on oral participation and the writing of your analysis of the selected article and the reports on other presentations. No final exam is organized.

Readings

The final list of papers will be finalized a few weeks before the start of the seminar. It could include the following articles

- Oscar Jorda, Moritz Schularick, and Alan M. Taylor. 2013. “When Credit Bites Back”. *Journal of Money, Credit and Banking* 45 (s2): 3–28.

- Moritz Schularick and Alan M. Taylor. 2012. “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008”. *American Economic Review* 102 (2): 1029–1061
- Simon Gilchrist and Egon Zakrajsek. 2012. “Credit Spreads and Business Cycle Fluctuations”. *American Economic Review* 102 (4): 1692–1720
- David Lopez-Salido, Jeremy C Stein, and Egon Zakrajsek. 2017. “Credit-market sentiment and the business cycle”. *The Quarterly Journal of Economics*.
- Financial accelerator
- Ben Bernanke and Mark Gertler. 1989. “Agency Costs, Net Worth, and Business Fluctuations”. *American Economic Review* 79 (1): 14–31
- Atif R Mian, Amir Sufi, and Emil Verner. 2017. “Credit Supply and Business Cycle Amplification: Evidence from Banking Deregulation in the 1980s”, NBER Working Papers 23802
- Berrak Bahadir and Inci Gumus. 2016. “Credit decomposition and business cycles in emerging market economies”. *Journal of International Economics* 103:250–262
- Household debt and the business cycle
- Mathias Drehmann, Mikael Juselius, and Anton Korinek. 2017. Accounting for debt service: the painful legacy of credit booms. BIS Working Papers No 645
- Emil Verner and Gyozo Gyongyosi. 2017. “Household Debt Revaluation and the Real Economy: Evidence from a Foreign Currency Debt Crisis”, MIT Sloan Working Paper 5476-18
- Atif Mian and Amir Sufi. 2018. “Finance and Business Cycles: The Credit-Driven Household Demand Channel”. *Journal of Economic Perspectives* 32 (3): 31–58.
- Bank lending channel
- Anil K Kashyap and Jeremy C Stein. 2000. “What do a million observations on banks say about the transmission of monetary policy?” *American Economic Review*: 407–428
- Gabriel Chodorow-Reich. 2014. “The employment effects of credit market disruptions: Firm- level evidence from the 2008–9 financial crisis”. *The Quarterly Journal of Economics* 129 (1): 1–59
- Gabriel Chodorow-Reich and Antonio Falato. 2017. “The Loan Covenant Channel: How Bank Health Transmits to the Real Economy”. NBER working paper 23879
- Michael Greenstone, Alexandre Mas, and Hoai-Luu Nguyen. 2014. “Do credit market shocks affect the real economy? Quasi-experimental evidence from the Great Recession and ‘normal’ economic times”. NBER working paper 20704
- Rhys M Bidder, John R. Krainer, and Adam H. Shapiro. 2017. “Drilling into Bank Balance Sheets: Examining Portfolio Responses to an Oil Shock”. Federal Reserve Bank of San Francisco Working Paper 2017-03

[Research seminar : Market regulation \(THEO, MF, SPP\)](#)

Professor:

Sven Heim (Mines ParisTech, CERNA & PSL)

Bertrand Villeneuve (Université Paris-Dauphine, LEDa & PSL)

Contact Information

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Bertrand Villeneuve : bertrand.villeneuve@dauphine.psl.eu

Information on the course :

Semester 2

Course load: 18 h, 6 sessions of 3 hours each

ECTS : 3

Overview:

This research aims at presenting and discussing the state-of-the-art research papers in the different fields of economics that involve thinking about market regulation. The seminar is organized in six sessions.

After an introductory class, sessions will be devoted to the critical assessment of articles recently published in top or top field journals. Each paper will be presented by one student and up to three students acting as “referees”, who will have to discuss the presentation and the paper itself.

Prerequisites

Familiarity with economics models (individual choice, equilibrium). Proficiency in the economics of information (game theory, asymmetric information, contracts).

Course Objectives:

The objective of the course is to get students familiar with the main issues in market regulation, with a particular emphasis on environmental and energy markets regulations, and on competition policy in world of massive data (barriers to entry, collusion, privacy).

Depending on the topic, the course will cover the recent empirical studies that approach these topics by using advanced econometric methods, or will show how theoretical models help explain and interpret facts or scenarios.

Work in this seminar is aimed to provide students with key skills in terms of research paper writing, research oral presentation, while at the same time build their knowledge of the most important issues in market regulation.

Mode of Assessment

The grade is based on oral participation and the writing of your analysis of the selected article and the reports on other presentations. No final exam is organized.

Readings (short list)

Here is provided a non-exhaustive list of papers that will be studied.

- Green, R. and D. Newbery (1992) “Competition in the British Electricity Spot Market,” *Journal of Political Economy* 100(5), 929-53.
- Fabra, N., N.H. von der Fehr, and D. Harbord (2006) “Designing Electricity Auctions,” *Rand Journal of Economics*, 37 (1), 23-46.

- Borenstein, S. (2011) "The Private and Public Economics of Renewable Electricity Generation", *Journal of Economic Perspectives*.
- Crawford, G. S., J. Crespo, H.V. Tauchen (2007) "Bidding Asymmetries in Multi-Unit Auctions: Implications of Bid Function Equilibria in the British Spot Market for Electricity," *International Journal of Industrial Organization*, 25 (6), 1233-1268.
- Autorité de la Concurrence and Bundeskartellamt (2016): "Competition policy and data". Joint report by the French and German competition authorities. <http://www.autoritedelaconcurrence.fr/doc/reportcompetitionlawanddatafinal.pdf>
- Caillaud, B. and Jullien, B. (2003) "Chicken & egg: competition among intermediation service providers", *RAND Journal of Economics*, 34(2), pp. 309-328
- Armstrong, M. (2006) "Competition in two-sided markets". *RAND Journal of Economics*, 37(3), pp. 668-691.
- Ezrachi, A. and Stucke, M. E., (2017) "Artificial Intelligence & Collusion: When Computers Inhibit Competition" . *University of Illinois Law Review*, Vol. 2017, 2017. <http://dx.doi.org/10.2139/ssrn.2591874>
- Heffetz, O., and Ligett, K. (2014) "Privacy and Data-Based Research." *Journal of Economic Perspectives*, 28 (2): 75-98. DOI: 10.1257/jep.28.2.75