

Annual Report

CORE Research Director Report
Academic Year 2018-2019



02

PRESENTATION

06

RESEARCH ACHIEVEMENTS AND
RECOGNITION

18

TRAINING

32

SCIENTIFIC EXCHANGES AND
COLLABORATIONS

47

PEOPLE

56

FUNDING

72

STATISTICS

1

- › [CORE TODAY](#)
- › [RESEARCH ACHIEVEMENTS AND RECOGNITION](#)
- › [TRAINING](#)
- › [SCIENTIFIC EXCHANGES AND COLLABORATIONS](#)
- › [PEOPLE](#)
- › [FUNDING](#)

PRESENTATION

PRESENTATION

Please find herewith the new **CORE RESEARCH REPORT** covering the period of September 2018 to August 2019. New persons, new research projects, publications and seminar activities, many new and bright ideas! Research at CORE is much more multifaceted nowadays than it used to be, and this makes life at CORE even more challenging than ever. We got recently several new research projects including an ERC grant for Anthony Papavasiliou, making the future brighter than ever! Thank you to you all for making CORE **a hive!**

Enjoy your reading! I hope you find herewith all the information you were looking for.

Isabelle Thomas

Research Director (2016-2019)



My warmest thanks to Fabienne Henry who patiently collected all the information and set it to music.



CORE today

Founded in 1966, the Center for Operations Research and Econometrics (CORE) is an interdisciplinary research center of UCLouvain. In 2010, CORE became one of the "poles" of IMMAQ, presently **LIDAM**, a UCLouvain research institute associating researchers from four different research entities: CORE, IRES (Institut de Recherches Economiques et Sociales), ISBA (Institute of Statistics, Biostatistics and Actuarial Sciences) and LFIN (Louvain Finance).

CORE follows **three objectives**. The first one is the development of scientific **research** in the fields of economics, econometrics, operations research and quantitative and economic geography. The second objective is the **training** of young researchers at the doctoral and postdoctoral stages of their career. The third objective is the promotion of local and international scientific **exchanges and collaborations**. This report gives an overview of the activities developed from Summer 2018 to Summer 2019. A more dynamic follow-up of the current activities can be found on the CORE website (<https://uclouvain.be/en/research-institutes/lidam/core>), and on social networks (https://www.facebook.com/CORE_UCL, https://twitter.com/CORE_UCL, https://en.wikipedia.org/wiki/Center_for_Operations_Research_and_Econometrics).

CORE's activities integrate fundamental and applied research to shed analytical light on a wide range of issues arising from economic policy and the management of private and public organizations. These research activities build on a common foundation of quantitative modelling and rigorous mathematical reasoning, encompassing many different fields of human activity. The main scientific disciplines to which CORE researchers actively contribute are: economics and game theory, econometrics, operations research, and quantitative and economic geography.

Research in **economics** and **game theory** at CORE is quite diverse and comprises applied and empirical work grounded on robust theoretical foundations. While general equilibrium and game theory were dominating themes in the early decades of CORE, current research in economics now includes applications of theory to problems in market regulation and the organization of the public sector. In 2018-2019, CORE members pursued active research projects in energy economics, industrial organization, public economics, political economics, education, environmental economics, welfare, general equilibrium and game theory.

Econometrics research at CORE is concerned with the development of quantitative models and of statistical and computational methods for the analysis of economic data. CORE's best known early contributions to econometrics were the introduction and development of Bayesian methods and inference. In 2018-2019, CORE members worked on financial econometrics, studying volatility models; on the development and analysis of high dimensional stochastic models, as well as identification and inference for time series and the analysis of complex data; and on further developments of Bayesian methods, in particular Markov Chain Monte Carlo algorithms and Bayesian inference.

Operations research deals with the development and application of analytical methods to help make better decisions. CORE has long been known for its methodological contributions to mathematical programming, in particular convex optimization and integer programming. It has expanded its interests and expertise to applications in data science, machine learning, operations management and energy markets. In 2018-2019, the CORE OR research group worked on the complexity of convex optimization methods, discrete optimization, graph theory, convergence analysis of first order methods for convex optimization, matrix factorization, applications of reinforcement learning, multi-agent modeling, regulatory economics, net metering and tariff design for the retail electricity sector, reserve sizing and pricing in electricity markets, capacity markets, and risk management.

Quantitative and economic geography brings a quantitative modelling orientation to the study of the location, distribution and spatial organization of economic and other human activities. In 2018-2019, QEG research at CORE was mainly devoted to measuring and modelling socio-economic, transport and urban/peri-urban realities, covering different spatial levels of analysis on such topics as optimal location-allocation modeling, spatial statistics, urban modelling, land-use planning policy issues, and system of cities. This research addressed methodological challenges brought about by our connected world and resulting enormous data bases, where spatial theories must be informed by Big Data analysis and modelling.

Research achievements and recognition

Scientific publications are the main output for research work in the directions pursued at CORE. In 2018–2019, CORE members have published seven [books](#) and 115 papers in international scientific journals. Many research papers are first released, following an internal refereeing process, as [CORE Discussion Papers](#), to elicit comments and discussion before or during submission to scientific journals. 18 papers contributed to the CORE Discussion Papers series in 2018-2019 and 78 published papers have been included in the [CORE Reprints Series](#). Details on these publications, as well as on other forms of publications, such as newspaper articles and commissioned reports contributed by CORE members, are to be found in [Part 2](#) (pages 6 to 17).

CORE researchers and their work received [international recognition](#): Elsevier Recognized Reviewer Award to Daniele Catanzaro, best paper presentation awards to Nikita Doikov and François Glineur. Jean-Jacques Herings and Isabelle Thomas were elected Fellows of prestigious international scientific associations. Yurii Nesterov was invited to present an **Honorable Hotelling Lecture** at the University of North Carolina while Anthony Papavasiliou received a **Starting Grant** ERC. Jacques Thisse Further details on these honors, prizes and awards can be found on [page 17](#).

Training

Training of young researchers takes several forms at CORE and are developed in [Part 3](#) of this report. In 2018-2019, CORE has hosted 44 [doctoral students and 6 postdoctoral research fellows](#). These junior researchers develop their research under the supervision of one or several permanent CORE academic members. Seven doctoral students presented their Ph.D. in this period

CORE is a founding member of, and an active participant in, two European doctoral programs: the [European Doctorate in Economics Erasmus Mundus](#) (EDEEM), of which 3 students were at CORE in 2018-2019, and the [Innovative Training Network 'Expectations and Social Influence Dynamics in Economics'](#) (ExSIDE), with 3 students at CORE in 2018-2019. Further details on these programs can be found on pages 34 to 36.

CORE also co-organized a [Doctoral Workshop](#) on the *economics of digitization* and a [Ph.D. Course](#) on *volatility modeling*. Doctoral students in economics at CORE also actively participated, together with students from other Belgian universities, in [Doctoral Workshops](#) in December 2018 and May 2019. Details on these workshops and course can be found on pages 26 to 39.

The [CORE Brown Bag seminar](#) series, launched in 2014 by junior researchers, provides a forum where junior researchers from CORE, UCLouvain and occasionally other institutions, present their current work or job market paper to obtain invaluable feedback in an attentive and friendly atmosphere. The Brown Bag Seminar series also welcomes research overview and expository presentations given by senior CORE academics. 17 seminars were held in 2018-2019. They are listed on [page 31](#) of this report.

Scientific exchanges and collaborations

One of the main features of CORE since its very foundation has been its focus on developing interuniversity and international scientific exchanges. CORE actively pursues this networking tradition, at both the institutional and individual levels. Such scientific

exchanges and collaborations, detailed in **Part 4**, take many forms, notably:

- The continuing stream of [research visitors](#), including *Affiliate Members*, usually former CORE members, who regularly visit CORE, typically for a few weeks each year and participate in seminars and other research activities; and **short-term visitors**, about 20 of them in 2018-2019, who spent from a few days to several months at CORE and presented their work at one of the weekly research seminars, participated in CORE workshops or conferences, and worked on joint research at CORE (see [page 33](#)).
- CORE organized or co-organized international and national [scientific meetings](#) (see pages 34 to 36).
- Following a well-established and successful CORE tradition, weekly research [seminars](#) in the four main CORE disciplines described above, allow CORE members and visitors to present their work and share ideas. 65 research seminars were held at CORE in 2018-2019. They are listed on pages 36 to 38).
- Finally, CORE members were invited to speak in [international and national conferences](#) and to give [research presentations](#) at various universities and research centers (see pages 38 to 46).

People

Permanent [academic members](#) form the «heart and soul» of CORE (see **Part 5**). In addition to conducting their own research and performing their own university duties, CORE academic members lead and supervise junior researchers, collaborate with visitors, coordinate and participate in research seminars, and contribute to the organization of scientific meetings. They also play a critical role in securing the financial support outlined below. CORE could not continue to be the lively, stimulating and welcoming research environment it is today without its efficient and friendly [administrative staff](#). These essential members of CORE create a place where the researchers can focus on their work without being hampered by practical issues. They also play an essential role in making CORE an attractive place for visitors. The contributions of the administrative staff are gratefully acknowledged.

Funding

Scientific activities are supported by CORE's participation in several **research projects and contracts**, detailed in **Part 6**. These projects are mainly financed by several Belgian public institutions (National Fund for Scientific Research (FRS-FNRS), Belgian Science Policy Office (Belspo), Région bruxelloise (Innoviris), Fédération Wallonie-Bruxelles (ARC)), the European Commission, as well as private and public partners.

CORE hosted a **Research Chair**: the [Kronos Group Chair in Strategic Sourcing and Procurement](#). This Research Chair provides financial and other support for junior and senior researchers, as well as for teaching, training and outreach activities.

Last, **and most importantly**, we gratefully acknowledge the continuing and vital support from **UCLouvain**.

2

- › [PUBLICATIONS](#)
 - › [BOOKS AND EDITED BOOKS](#)
 - › [CORE REPRINTS](#)
 - › [PAPERS PUBLISHED BY CORE MEMBERS BUT NOT INCLUDED IN THE REPRINTS](#)
 - › [CORE DISCUSSION PAPERS](#)
 - › [OTHER DISCUSSION PAPERS AND MANUSCRIPTS BY CORE MEMBERS](#)
 - › [MEDIA](#)
 - › [REPORTS](#)
- › [PRIZES AND AWARDS](#)

RESEARCH ACHIEVEMENTS AND RECOGNITION

RESEARCH ACHIEVEMENTS AND RECOGNITION

Publications

BOOKS AND EDITED BOOKS

- ▶ Bart Capéau, Laurens Cherchye, Koen Decancq, André Decoster, Bram De Rock, **François Maniquet**, Annemie Nys, Guillaume Périlleux, Eve Ramaekers, Zoé Rongé, Erik Schokkaert et Frédéric Vermeulen. *En faut-il peu pour être heureux ? Conditions de vie, bonheur et bien-être en Belgique*. Wavre, Anthemis, 2019.

Qu'est-ce qu'une belle vie ? Pour la plupart des gens, la notion de bien-être s'étend au-delà de la richesse financière ou matérielle. En effet, beaucoup d'aspects non matériels, tels que la santé, la vie de famille, le cadre de vie, la répartition du temps et la qualité du travail, sont au moins aussi importants pour bien vivre. Tous ces aspects influencent la mesure dans laquelle les gens sont satisfaits de leur vie et se sentent heureux.

Dans ce livre, les auteurs soutiennent toutefois que le bonheur et la satisfaction à l'égard de la vie ne sont pas de bons indicateurs pour la mesure du bien-être. Ils proposent une méthode alternative, celle du revenu équivalent, tenant compte non seulement des différentes dimensions du bien-être, mais également de l'opinion qu'ont les individus quant à ce qui est important dans leur propre vie.

Le livre ne se base pas que sur de la théorie. Une enquête à grande échelle menée auprès d'un échantillon représentatif de plus de 3.000 adultes issus de 2.000 familles belges a permis de décrire de manière détaillée les différents aspects du bien-être individuel des Belges. Son originalité réside dans l'attention portée à la répartition inégale des différents aspects du bien-être au sein même des familles.

Il ressort de l'enquête que certains Belges cumulent des désavantages dans plusieurs dimensions du bien-être. La méthode du revenu équivalent permet d'identifier les personnes les plus démunies dans notre société, qui ne s'avèrent pas nécessairement être celles qui perçoivent les revenus les plus faibles ni les plus malheureuses. Ces personnes méritent, selon les auteurs, une attention particulière de la part des responsables politiques.

- ▶ Bart Capéau, Laurens Cherchye, Koen Decancq, André Decoster, Bram De Rock, **François Maniquet**, Annemie Nys, Guillaume Périlleux, Eve Ramaekers, Zoé Rongé, Erik Schokkaert et Frédéric Vermeulen. *Wat heet dan gelukkig zijn? geluk, welvaart en welzijn van de Belgen*. Antwerpen, Garant, 2018.

Wat is een goed leven? Wel-zijn is voor de meeste mensen meer dan een hoog inkomen of louter materiële welvaart. Vele niet-materiële aspecten zoals gezondheid, gezinsleven, leefomgeving, een zinvolle tijdsbesteding of de kwaliteit van een job zijn minstens even belangrijk voor een geslaagd leven. Al die aspecten samen beïnvloeden ook de mate waarin mensen tevreden zijn over hun leven en bepalen mee hoe gelukkig ze zich voelen. In dit boek argumenteren de auteurs echter dat geluk of levenstevredenheid geen goede maatstaf is voor het meten van welzijn. Zij stellen een alternatieve methode voor die niet enkel rekening houdt met de verschillende dimensies van welzijn, maar ook met het feit dat mensen hun eigen opvattingen hebben over wat belangrijk is in hun leven.

Het blijft niet enkel bij theorie. Een grootschalige en representatieve enquête bij meer dan 3000 volwassenen uit ruim 2000 Belgische gezinnen liet toe de verschillende aspecten van het individuele welzijn van de Belgen in kaart te brengen. Origineel is dat ruim aandacht besteed wordt aan de ongelijke verdeling van deze verschillende welzijnsaspecten binnen gezinnen. Uit de enquête blijkt dat sommige Belgen vaker lijden aan opgestapelde achterstand in meerdere welzijns dimensies. Het boek beschrijft vervolgens welke mensen er in de samenleving het slechtst aan toe zijn volgens de nieuwe methode. Zij verdienen volgens de auteurs de grootste aandacht van de beleidsmakers. En dat zijn niet noodzakelijk enkel diegenen met een laag inkomen, of diegenen die zich ongelukkig voelen.

- Kristof De Witte et **Jean Hindriks**.
L'école du renouveau. Bruxelles, Itinera (SKRIBIS) , 2018.

Notre enseignement fait face à des défis majeurs qui nous contraignent à modifier et réformer notre système. Ce livre présente plusieurs réformes importantes de l'enseignement francophone et néerlandophone. Plus concrètement, il aborde la réforme de l'enseignement secondaire en Flandre, le décret M, le Pacte d'Excellence, la formation des enseignants et l'enseignement en alternance. Il se penche également sur des expériences réussies menées à l'étranger dont nos propres réformes pourraient s'inspirer. Outre les réformes, nous nous intéressons à la formation des élèves, et à l'idéal poursuivi d'une école équitable et efficace que nous baptiserons « école de la chance ». Comment définir une telle école et quelles sont ses caractéristiques ? Nous discutons aussi de la transition numérique dans nos écoles et notamment de son efficacité et de la perception des enseignants et des élèves. Nous terminons par la question de l'enseignement supérieure avec une évaluation des politiques de sélection, des droits d'inscription et de rationalisation de l'offre dans l'enseignement supérieur. Le livre est accessible à un large public.

- Fakhtech Ghanbarnejad, Rishiraj Saha Roy, Fariba Karimi, **Jean-Charles Delvenne** and Bivas Mitra (eds).
Dynamics on and of Complex Networks III. Machine Learning and Statistical Physics Approaches. Springer Proceedings in Complexity. Cham, Springer, 2019.

This book bridges the gap between advances in the communities of computer science and physics – namely machine learning and statistical physics. It contains diverse but relevant topics in statistical physics, complex systems, network theory, and machine learning. Examples of such topics are: predicting missing links, higher-order generative modeling of networks, inferring network structure by tracking the evolution and dynamics of digital traces, recommender systems, and diffusion processes.

The book contains extended versions of high-quality submissions received at the workshop, Dynamics On and Of Complex Networks (doocn.org), together with new invited contributions. The chapters will benefit a diverse community of researchers. The book is suitable for graduate students, postdoctoral researchers and professors of various disciplines including sociology, physics, mathematics, and computer science.

- Leo Neels, Ivan Van de Cloot, **Jean Hindriks**, Johan Albrecht, Simon Chiotto, Marc De Vos, Paul Becue and Cin Du Bois.
Un projet pour la Belgique. Leuven: Lannoo Campus, 2019.

La Belgique peut mieux faire.

La Belgique est un pays où il fait bon vivre : en moyenne, le niveau de vie et de bien-être de ses habitants est bon, le pays n'a pas de problèmes de sécurité inquiétants, et les élections se déroulent généralement sans incident majeur. Pour autant, le pays aurait tort de s'en accommoder : en comparaison avec les pays voisins, la Belgique affiche en effet une performance moyenne. D'autres pays enregistrent une croissance plus rapide et sont plus favorables à l'entrepreneuriat, le niveau de notre enseignement se dégrade, et la gouvernance publique pourrait être plus simple et plus efficace. La Belgique a donc encore une grande marge de progression.

Un projet pour la Belgique analyse la situation et rassemble les pièces du puzzle pour parvenir à formuler un plan d'action. Ce projet invite à porter un regard neuf sur les politiques en matière d'emploi, de pension, d'enseignement, de fiscalité, de transition énergétique, de soins de santé, de sécurité économique et d'entrepreneuriat. Il propose un programme audacieux et ambitieux qui doit permettre à la Belgique de renouer avec une prospérité durable. Ce projet invite tous les citoyens, électeurs ou militants politiques, à prendre leurs responsabilités.

- **Yurii Nesterov**.
Lectures on Convex Optimization (2nd edition). Cham, Springer, 2018.

This book provides a comprehensive, modern introduction to convex optimization, a field that is becoming increasingly important in applied mathematics, economics and finance, engineering, and computer science, notably in data science and machine learning.

Written by a leading expert in the field, this book includes recent advances in the algorithmic theory of convex optimization, naturally complementing the existing literature. It contains a unified and rigorous presentation of the acceleration techniques for minimization schemes of first- and second-order. It provides readers with a full treatment of the smoothing technique, which has tremendously extended the abilities of gradient-type methods. Several powerful approaches in structural optimization, including optimization in relative scale and polynomial-time interior-point methods, are also discussed in detail.

Researchers in theoretical optimization as well as professionals working on optimization problems will find this book very useful. It presents many successful examples of how to develop very fast specialized minimization algorithms. Based on the author's lectures, it can naturally serve as the basis for introductory and advanced courses in convex optimization for students in engineering, economics, computer science and mathematics.

Henry Tulkens.

Economics, Game Theory and International Environmental Agreements: The Ca' Foscari Lectures. World Scientific Lecture Notes in Economics and Policy, Book 7. London, World Scientific Publishing Company, 2019.

The science and management of environmental problems is a vast area, comprising both the natural and social sciences, and the multidisciplinary links often make these issues challenging to comprehend. *Economics, Game Theory and International Environmental Agreements: The Ca' Foscari Lectures* aims to introduce students to the multidimensional character of international environmental problems in general, and climate change in particular.

Ecology, economics, game theory and diplomacy are called upon and brought together in the common framework of a basic mathematical model. Within that framework, and using tools from these four disciplines, the book develops a theory that aims to explain and promote cooperation in international environmental affairs.

Other books on the topic tend to be research-oriented volumes of various papers. Instead, this is a book that offers a reasonably-sized synthesis of the multidimensional societal problems of transfrontier pollution, particularly of climate change. It uses mathematical modeling of economic and game theory concepts to examine these environmental issues and demonstrate many results in an accessible fashion. Readers interested in understanding the links between ecology and economics, as well as the connection between economics and institutional decision-making, will find in this text not only answers to many of their queries but also questions for further thinking.

CORE REPRINTS

Econometrics

- 2983.** Antonis Demos and **Dimitra Kyriakipoulou**. Finite-sample theory and bias correction of maximum likelihood estimators in the EGARCH model. *Journal of Time Series Econometrics*, 11(1), 2018.
- 2985.** Yukai Yang and **Luc Bauwens**. State-space models on the Stiefel Manifold with a new approach to nonlinear filtering. *Econometrics*, 6(4), 48, 2018.
- 3024.** **Zhengyuan Gao** and **Christian M. Hafner**. Looking backward and looking forward. *Econometrics*, 7(27), 2019.
- 3025.** **Christian Hafner**. Testing for bubbles in cryptocurrencies with time-varying volatility. *Journal of Financial Econometrics*, 2018.

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- 2991.** **Axel Gautier**, Brieuc Hoet, Julien Jacqmin and Sarah Van Driessche. Self-consumption choice of residential PV owners under net-metering. *Energy Policy*, 128, 648-653, 2019.
- 2993.** Kristof De Vos, Nicolas Stevens, Olivier Devolder, **Anthony Papavasiliou**, Bog Hebb and James Matthys-Donnadieu. Dynamic dimensioning approach for operations reserves: Proof of concept in Belgium. *Energy Policy*, 124, 272-285, 2019.
- 2995.** **Axel Gautier** et Julien Jacqmin. Une nouvelle tarification des réseaux pour favoriser la transition énergétique. *Regards Economiques*, 145, 2019.
- 2996.** H el ene Le Cadre, Ily es Mezghani and **Anthony Papavasiliou**. A game-theoretic analysis of transmission-distribution system operator coordination. *European Journal of Operational Research*, 274, 317-339, 2019.
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- 2986.** Frédéric Vrins. Bannissement des produits dérivés : la bonne affaire ? *Regards Economiques*, 142, 2018.
- 2990.** Christophe Profeta and Frédéric Vrins. Piecewise constant martingales and lazy clocks. *Probability, Uncertainty and Quantitative Risk*, 4:2, 2019.
- 3060.** Paolo Gambetti, Geneviève Gauthier and Frédéric Vrins. Stochastic recovery rate: Impact of pricing measure's choice and financial consequences on single-name products. In M. Mili, F. Di Pietro and R. Samaniego Medina (eds.), *New Methods in Fixed Income Modeling*, Contributions to Management Science. Cham: Springer, 181-203, 2018.

Game Theory

- 3001.** Ana Mauleon, Nils Roehl and Vincent Vannetelbosch. Paths to stability for overlapping group structures. *Journal of Mathematical Economics*, 83, 19-24, 2019.
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- 3026.** Jean-Jacques Herings, Ana Mauleon and Vincent Vannetelbosch. Stability of networks under horizon-K farsightedness. *Economic Theory*, 68, 177-201, 2019.

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- 3035.** François Maniquet. Comments on John Roemer's first welfare theorem of market socialism. *Review of Social Economy*, 77(1), 56-68, 2019.
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- 3037.** Jean-Charles Delvenne et al. Multiscale dynamical embeddings of complex networks. *Physical Review E*, 99, 062308, 2019.
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- 2992.** **Yurii Nesterov**. Complexity bounds for primal-dual methods minimizing the model of objective function. *Mathematical Programming Series A*, 171, 311-330, 2018.
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- 3000.** **François Glineur**. Linear convergence of first order methods for non-strongly convex optimization. *Mathematical Programming Series A*, 175, 69-107, 2019.
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- 3008.** **Laurence A. Wolsey** and Hande Yaman. Convex hull results for the warehouse problem. *Discrete Optimization*, 30, 108-120, 2018.
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- 3048.** Pascal Mossay and **Pierre M. Picard**. Spatial segregation and urban structure. *Journal of Regional Science*, 59(3), 480-507, 2019.

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- 3028.** **Victor Ginsburgh** and Juan Moreno-Ternero. Compensation schemes for learning a *Lingua Franca* in the European Union. *The World Economy*, 41, 1775-1789, 2018.
- 3032.** **François Maniquet**. L'articulation entre les démarches positive et normative dans quelques branches de l'économie. *Revue Philosophique de Louvain*, 116(2), 187-213, 2018.
- 3046.** Gianpiero Meloni, **Dimitri Paolini** and Juan de Dios Tena. American beauty: Trade flows and export costs of US Movies. *Journal of Cultural Economics*, 42, 701-716, 2018.

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- 2019/01** Nathan Lassance and **Frédéric Vrins**. Minimum entropy portfolios.

Game Theory

- 2018/30** Manuel Föster, **Ana Mauleon** and **Vincent Vannetelbosch**. Shadow links.
- 2019/10** Irinel Dragan and **Pierre Dehez**. Alternative representation of semivalues, the inverse problem and coalitional rationality.
- 2019/12** Ata Atay, **Ana Mauleon** and **Vincent Vannetelbosch**. A bargaining set for roommate problems.

Industrial Organization

- 2019/06** **Paul Belleflamme** and Martin Peitz. Ratings, reviews, recommendations and the consumption of cultural goods.
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2019/05 Mathieu Lefebvre, **Pierre Pestieau** and Gregory Ponthiere. Missing poor in the U.S.

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- **Bart Jourquin**. Des transports en commun gratuits une fausse bonne idée. *Le Soir*, 19 février 2019.
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- **Leonardo Madio.** The market of cannabis. *Business Insider, La cannabis light sottrae fino a 170 milioni all'anno alle organizzazioni criminali in Italia.* May 14, 2019
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- **François Maniquet.** Revenu, santé, logement, travail... En faut-il peu pour être heureux. *La RTBF*, 16 janvier 2019.
- **François Maniquet.** Mesurer le bien être, ce n'est pas une mince affaire. *La Libre*, 17 janvier 2019.
- **François Maniquet.** Un peu de sérotonine dans votre café ? *La Libre*, 31 janvier 2019.
- **Pierre Pestieau** et Gregory Ponthiere. Espérance de vie et prévention des risques liés au vieillissement. *Risques* 116, décembre 2018.
- **Isabelle Thomas.** Déplacements domicile-travail: comment résoudre le casse-tête? *HR Square* 28, 8 mai 2019.
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- **Anthony Papavasiliou, Yves Smeers** and Gauthier de Maere d'Aertrycke. Study on the general design of a mechanism for the remuneration of reserves in scarcity situations. CREG Report Final, June 6, 2019. (https://perso.uclouvain.be/anthony.papavasiliou/public_html/CREGReportFinal.pdf).

Prizes & Awards

- **Daniele Catanzaro** received the *Elsevier Recognized Reviewer Award* in 2018.
- **Nikita Doikov** was assigned the *Best Paper Presentation Award* for his talk «Randomized Block Cubic Newton Method» presented at the Summer School on Optimization, Big Data and Applications, Veroli, Italy, 2019.
- Etienne de Klerk, **François Glineur** and Adrien Taylor received the *Optimization Letters Best Paper Awards for 2017* for their paper «On the worst-case complexity of the gradient method with exact line search for smooth strongly convex functions published in *Optimization Letters*, 13(1), 2018.
- **Jean-Jacques Herings** was elected *Economic Theory Fellow* of the Society for the Advancement of Economic Theory (SAET) in 2019.
- **Yurii Nesterov** was invited to present an *Honorable Hotelling Lecture* at the University of North Carolina at Chapel Hill in April 2019. The subject of his presentation was «*Hunting for invisible hands*».
- **Anthony Papavasiliou** received a *Starting Grant ERC* from European Research Council in 2019 for his projet called ICEBERG: «Scalable Optimization of Power Systems with Flexible Demand and Renewable Supply».
- **Jacques-François Thisse** received the Academic Honours Medal from the Higher School of Economics of Moscow in 2018.
- **Isabelle Thomas** was elected Fellow of the *Regional Science Association International* (RSAI) in June 2019.

3

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Junior Researchers

PH.D. STUDENTS AND JUNIOR RESEARCHERS

Arnaud Adam · Gautier Attanasi · Daniel Avila · Sinem Bas · Gilles Bertrand · Sefane Çetin · Xuyang Chen · Fabrizio Ciotti · Sarah Damai · Pierre de Callataÿ · Henri Dehaybe · Julien Dewez · Nikita Doikov · Jérôme Dollinger · Cyrille Dossougoin · Valeria Forlin · Martin Frohn · Sylvain Funck · Céline Gérard · Andras Gregor · Madeleine Guyot · Thuc Huan Ha · Thomas Hacardiaux · Manuel Herrera Rodriguez · Quentin Lete · Liana Sabina Luncaşu · Chenghong Luo · Simone Martelli · Ilyes Mezghani · Gaëtan Montero Redondo · Yuting Mou · Mariam Nanumyam · Risa Pavia · Wenli Peng · Erika Pini · José-Miguel Quedada Perez · Anton Rodomanov · Mathieu Sauvenier · Valerio Serse · Yu Sun · Akylai Taalibekova · Lorenzo Tondi · Sonia Trabelsi

POST DOCTORAL FELLOWS

Research fellows are scholars working at CORE for a period of one to three years.

- Olivier Finance, Université Paris1 Panthéon-Sorbonne, France
- Dimitra Kyriakopoulou, Bank of Greece, Greece
- Leonardo Madio, University of York, United Kingdom
- Seyed Hassan Nosratabadi, Rutgers University, USA
- Simon Schopohl, Université Saint-Louis, Brussels, Belgium
- Yi Zhu, Università Politecnica delle Marche, Ancona, Italy

Completed PhD Dissertations

Seven CORE doctoral students successfully defended their Doctoral Dissertation at CORE.

- **Ignacio Andrés Aravena Solis**, *Analysis of renewable energy integration in transmission-constrained electricity markets using parallel computing*
Ecole des Sciences, UCLouvain, Belgium, September 3, 2018 under the supervision of **Anthony Papavasiliou**
Current position: Lawrence Livermore National Laboratory, Livermore, USA

Renewable energy integration has progressively challenged the operating assumptions of electricity markets, questioning at first the deterministic nature of day-ahead and other forward electricity markets. As the integration of renewable resources became deeper, transmission grids began to experience congestion in unforeseen, dynamic and uncertain patterns, questioning now the management of transmission constraints in electricity markets. This dissertation proposes detailed models and algorithms for analyzing the impacts of uncertain renewable supply on different transmission-constrained electricity market designs, using parallel computing extensively in order to solve large-scale mathematical programs and to carry out simulations under different operating conditions for realistic systems.

The contributions of the dissertation are organized in three chapters. Chapter 2 presents an asynchronous distributed algorithm for solving the stochastic unit commitment problem. The algorithm, deployed in parallel, is able to solve realistic instances of stochastic unit commitment within operationally acceptable tolerances and solution times. Chapter 3 proposes a consistent framework for modelling different zonal electricity markets. We develop cutting-plane algorithms to incorporate the N-1 criterion into this framework and we conduct simulations using single-period models for the Central Western European system under 768000 different operating conditions. In Chapter 4, we propose a hierarchy of mathematical programs that model the European zonal electricity market organization in detail in a multi-period setting. We compare the performance of this organization to the performances of a nodal market and the stochastic unit commitment model on the Central Western European system. Numerical results in Chapters 3 and 4 indicate that failing to account for the limitations of the transmission grid, in a regime of large-scale renewable energy integration, can undermine system performance to much a larger extent than failing to account for uncertainty in nodal electricity markets.

- ▶ **Simone Martelli**, *The role of cities for climate change mitigation in Europe*
Economics School of Louvain, UCLouvain, Belgium, October 4, 2018 under the supervision of **Thierry Bréchet** and **Paolo Paruolo**
Current position: Italian Ministry of Economy and Finance, Italy

In order to support the negotiation of international climate agreements and the achievement of global and national greenhouse gas emission reduction targets, regional and sub-national coalitions have emerged. This doctoral thesis analyses local climate mitigation strategies, based on voluntary climate agreements, and the political incentives promoting their adoption. Chapter 1 illustrates the strategies designed by a sample of 124 European large cities joining the EU Covenant of Mayors. It shows that cities' contribution to climate mitigation can be notable, exceeding internationally agreed targets; however, this is limited to selected sectors, under their jurisdiction. Chapter 2 eliminates electoral incentives for local governors to enter a climate agreement. On average, mayors committing to reduce greenhouse gas emissions in their municipality do not lose electoral support at subsequent elections with stronger positive effects in cities with better economic conditions and a younger population. Chapter 3 unfolds a broader set of incentives encouraging local governors' action. Private benefits (political income) from increased visibility and networking in a climate coalition seem to support the adoption of voluntary climate commitments. Overall, there is much scope to further engage local administrations in climate mitigation (and adaptation) action. Beyond this, future research could explore the contribution of city's actions to «making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development» (art. 2.1.C of the Paris agreement).

- ▶ **Sinem Bas** (EDEEM Student), *Essays on inequality, poverty and gender inequality, with applications to Turkey*
Economics School of Louvain, UCLouvain, Belgium, December 5, 2018 under the supervision of **François Maniquet** and **Alain Chateauneuf**
Current position: TUR&BO -Turkish Research and Business Organisations- PPP, Brussels, Belgium

This PhD dissertation contributes to the literature on household economics and the measurement of poverty and inequality. The first chapter extends the generalized Yaari's dual theory of choice with multivariate risks providing an axiomatic definition for multidimensional quantiles. By taking advantage of the formal equivalence between the evaluation of risky prospects and the measurement of inequality, we show that our inequality averse multivariate decision functional can be interpreted as a social evaluation function for allocations of multiple attributes (such as income, health). The second chapter describes how to obtain a weighting scheme based on the revealed preferences of individuals in the Alkire and Foster's multidimensional poverty framework. These weights indicate the trade-offs between the dimensions of poverty. With application to Turkey, we show that individuals do not give equal importance to the dimensions, preference heterogeneity leads to weight heterogeneity and weights should be determined distinctly for each subgroup of the population. The third chapter analyses the extent of inequality within households in Turkey by inferring the share a woman would get as her private consumption from total household income, and examines the effect of the change in the default property regime in case of divorce on this share. It is shown that married women receive less than the equal share of total household income, and this share is higher for women who are affected by the new default regime.

- ▶ **Cyrille Dossougoin**, *Essays on empirical financial spillovers*
Economics School of Louvain, UCLouvain, Belgium, December 5, 2018 under the supervision of **Sophie Béreau** and **Nicolas Debarsy**
Current position: Belgian Fund for Scientific Research at CORE, UCLouvain, Belgium

The increasing globalization of the world's economies creates linkages among economic agents that can amplify financial crisis when it occurs. The 2008 global financial crisis exposed the need to deepen our understanding of the channels through which financial risks propagate across countries. Moreover, preventing the occurrence of future crises requires new surveillance indicators that incorporate interactions between actors of the global economy. This thesis examines the transmission of financial risk by leveraging recent econometric techniques which explicitly accounts for the linkages among economic agents. It consists on three essays organized around two principal axes. The first essay proposes an original framework to analyze the relative importance of multiple transmission channels of risk across countries. It also derives indicators for global financial risk monitoring. The remaining two essays study the time-varying nature of transmission channels and their implications for empirical analysis. They take respectively the microeconomic and macroeconomic perspectives.

- ▶ **Andras Gregor**, *Essays on empirical political economics*
Economics School of Louvain, UCLouvain, Belgium, December 17, 2018 under the supervision of **Jean Hindriks**
Current position: IWEBS, Namur, Belgium

For decades, economists have not only given economic advice to politicians and government officials, but have researched the formulation of policy and the making of political decisions. This interest in the interaction between political decision-making and economics has not declined, and empirical analysis on this topic has gradually begun to catch up with theoretical

developments. In this doctoral thesis, I contribute to these empirical exercises by testing different theoretical predictions using Hungarian municipal-level data. In Chapter 2, I test a workhorse model of political economy, the probabilistic voting model, on Hungarian municipal data. The main prediction of the model is that tighter elections among political parties increase targeted transfers to swing and/or poor municipalities. My main contributions are applying a new measure of political competition, pivotal probability, and demonstrating that this measure captures the effect of competition while more common measures, such as closeness of vote share among dominant political blocks, do not. In Chapter 3, I test whether or not a mayor's alignment to Hungary's governing party influences the expenditure and revenue structure of the mayor's own municipality. The main contribution lies in identifying political alignment in a novel way and showing that not the alignment in itself, but its strength, influences local public finances. In Chapter 4, I provide evidence of the effects of plurality and proportional electoral formulas on local fiscal outcomes. In Hungary, different voting regimes are applied in electing local council members according to municipal population size. Not only the electoral formula, but also the district magnitude (the number of council members), varies at different population thresholds. This setting allows me to apply a regression discontinuity design to identify causal effects of the electoral formulas on political and local fiscal outcomes while also controlling for variation in district magnitude. My contribution shows that the electoral formula indeed influences the composition of spending, but the overall per capita size does not. Moreover, the district magnitude has no effect on spending.

➤ **Valeria Forlin**, *Essay in industrial organization and environmental economics*

Economics School of Louvain, UCLouvain, Belgium, December 17, 2018 under the supervision of **Paul Belleflamme**
Current position: Policy Officer, European Commission, Brussels, Belgium

This work analyses the incentives for the private sector to adopt business strategies with a lower impact on the environment. The analytical toolset of industrial organization is used to explicitly consider competition forces as an important driver behind the adoption of greener business models.

The first strategy discussed is the adoption of an eco-label. By extending the classical vertical differentiation model to a Cournot oligopoly (a model developed under more general conditions in Chapter 1), Chapter 2 formalizes the argument that more ambitious eco-labelling standards increase the quality on offer in the labelled segment of the industry, but also undermine the uptake of such eco-label. The optimal level of eco-label standard that maximizes total profits, consumer surplus, or environmental quality thus depends on its impact on competition levels both in the labelled and in the conventional segment of the industry.

The second strategy analysed is the introduction of take-back programs that reward consumers for dropping off old items when they purchase a new product (Chapter 3). The proposed model identifies the main drivers behind the introduction of such strategies, characterizes the optimal reward level, analyses the impact of take-back programs on social welfare, and discusses policies aimed at increasing their uptake.

➤ **Arnaud Adam**, *Exploring new geographies of interactions in and around the metropolitan area of Brussels*

School of Geography, UCLouvain, Belgium, August 26, 2019 under the supervision of **Isabelle Thomas**
Current position: CORE, UCLouvain, Belgium

In a global effort to achieve sustainable land management, regional and urban planning call for new adaptive datasets and methods to better grasp interactions between people and places. Understanding the individual movements of people, their communications within social networks and the relationships with the geographies of places are hence fundamental knowledges for land use policies.

Conventional and unconventional large data sets are here analyzed to define 'interaction fields', their composition and their delineation as well as their polarization. Several quantitative methods are applied, among which the Louvain Method that detects mathematical communities. Analyses are here performed on Belgium and Brussels.

The two first parts of this PhD draw the theoretical and methodological frameworks: urban models and interaction fields are presented, while sensitivity analyses of the Louvain Method are developed and performed. The third part analyses commuting, migration and train schedules requests. Results show that communities are much larger for commuting movements than those obtained by residential changes, and that administrative borders are serious constraints. The fourth part deals with mobile phone calls. The very fine scale of the data and their variation in time not only lead to the pulses of the city of Brussels but also to partitions varying in time and space highly associated to the characteristics of the places. Last but not least, the fifth part analyses the GPS traces of the trucks. Diverting such a dataset from its original fiscal objective is not an easy task: data pre-processing and conceptualization are time consuming. Communities are mapped and discussed, showing that this dataset is a real opportunity to model goods transportation.

Unconventional data are a real opportunity to measure and understand space(s), but they need to be clearly understood and geographically/theoretically conceptualized.

Ph.D. Dissertations in progress

Gautier Attanasi

- Title: Dimension reduction of high dimensional nonstationary time series
- Supervisor: Sébastien Van Bellegem
- Started: 2014
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Daniel Avila

- Title: A stochastic programming approach to multi-stage TSO-DSO coordination under uncertainty
- Supervisor: Anthony Papavasiliou
- Started: 2018
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Gilles Bertrand

- Title: Adaptive trading in the continuous intraday market
- Supervisor: Anthony Papavasiliou
- Started: 2016
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Sefane Çetin

- Title: Heterogenous preferences and risk sharing under different pension systems
- Supervisor: Jean Hindriks
- Started: 2018
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Xyuan Chen

- Title: Tax enforcement and multinationals' profit shifting
- Supervisor: Jean Hindriks
- Started: 2018
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Fabrizio Ciotti

- Title: The economics of digitization
- Supervisor: Paul Belleflamme
- Started: 2018
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Sarah Damai

- Title: Managing inpatient patient flows in a hospital taking into account the patient diagnosis and the stochastic nature of arrivals
- Supervisor: Philippe Chevalier
- Started: 2018
- Doctoral School: Louvain School of Management, UCLouvain, Belgium

Pierre de Callatay

- Title: The role of information in social dilemmas
- Supervisor: Vincent Vannetelbosch
- Started: 2018
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Henri Dehaybe

- Title: A deep reinforcement learning approach for solving stochastic inventory problems
- Supervisor: Philippe Chevalier
- Started: 2018
- Doctoral School: Louvain School of Management, UCLouvain, Belgium

Julien Dewez

- Title: Lower bounds on the nonnegative rank
- Supervisor: François Glineur
- Started: 2013
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Nikita Doikov

- Title: Development of second order methods for structured optimization problems
- Supervisor: Yurii Nesterov
- Started: 2019
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Jérôme Dollinger

- Title: Coalitions interrelations and co-evolutions
- Supervisors: Ana Mauleon And Vincent Vannetelbosch
- Started: 2016
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Martin Frohn

- Title: Greed, majorization, and their impact on optimization over lattices of unrooted binary trees
- Supervisor: Daniele Catanzaro
- Started: 2017
- Doctoral School: Sciences, UCLouvain, Belgium

Sylvain Funck

- Title: Matching with group-dependent preferences: Refugees resettlement and employment guarantee scheme
- Supervisors: Ana Mauleon and Vincent Vannetelbosch
- Started: 2018
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Céline Gérard

- Title: Mobilizing flexible demand in electric power systems through service quality differentiation
- Supervisor: Anthony Papavasiliou
- Started: 2017
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Madeleine Guyot

- Title: Urban landscape morphometrics and mental health: The example of Brussels
- Supervisors: Isabelle Thomas and Sophie Vanwambeke
- Started: 2017
- Doctoral School: Sciences, UCLouvain, Belgium

Thuc Huan Ha

- Title: Essays on industrial organization and the circular economy
- Supervisors: Paul Belleflamme and Thierry Bréchet
- Started: 2015
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Thomas Hacardiaux

- Title: Benefits and triggering factors of horizontal cooperation in supply chains
- Supervisor: Jean-Sébastien Tancrez
- Started: 2015
- Doctoral School: Louvain School of Management, UCLouvain, Belgium

Manuel Herrera Rodriguez

- Title: Three essays on port network optimization and Panama canal models
- Supervisor: Per Agrell
- Started: 2014
- Doctoral School: Louvain School of Management, UCLouvain, Belgium

Quentin Lété

- Title: Models and algorithms for the active management of the European electricity grid
- Supervisor: Anthony Papavasiliou
- Started: 2018
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Liana-Sabina Lucasu

- Title: Nonparametric estimation of efficiency frontiers with noise in both variables
- Supervisor: Sébastien Van Belleghem
- Started: 2016
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Chenghong Luo (ExSide Student)

- Title: Homophily and segregation in social networks when individuals are (limited) forward-looking
- Supervisors: Ana Mauleon and Vincent Vannetelbosch
- Started: 2017
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium and Ca' Foscari University of Venice, Italy

Ilyès Mezghani

- Title: Coordinated scheduling of transmission and distribution operations in electric power systems
- Supervisor: Anthony Papavasiliou
- Started: 2016
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Gaetan Montero Redondo

- Title: Measuring and understanding the morphology of urban space. Theoretical and empirical contributions on the basis of Brussels metropolitan area
- Supervisor: Isabelle Thomas
- Started: 2015
- Doctoral School: Sciences, UCLouvain, Belgium

Yuting Mou

- Title: Mobilizing flexibility in power systems under renewable supply uncertainty
- Supervisors: Philippe Chevalier and Anthony Papavasiliou
- Started: 2015
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Mariam Nanumyam (ExSide student)

- Title: The impact of opinion formation on expectations and market dynamics
- Supervisors: Vincent Vannetelbosch and Herbert Dawid
- Started: 2017
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium and Universität Bielefeld, Germany

Risa Pavia (EDEEM student)

- Title: Taxation of multinational corporations
- Supervisors: Jean Hindriks and Susana Peralta
- Started: 2014
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium and Universidade Nova de Lisboa, Portugal

Wenli Peng

- Title: Global supply chains modelling
- Supervisor: Philippe Chevalier
- Started: 2012
- Doctoral School: Louvain School of Management, UCLouvain, Belgium

Erika Pini

- Title: Economic inequality, political polarization and voter turnout
- Supervisor: François Maniquet
- Started: 2016
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

José-Miguel Quesada Perez

- Title: Express shipment service network design: Challenges, advances and robustness
- Supervisor: Jean-Sébastien Tancrez
- Started: 2014
- Doctoral School: Louvain School of Management, UCLouvain, Belgium

Anton Rodomanov

- Title: Quasi-Newton methods with provable efficiency guarantees
- Supervisor: Yurii Nesterov
- Started: 2019
- Doctoral School: Sciences de l'Ingénieur, UCLouvain, Belgium

Mathieu Sauvenier

- Title: High dimensional sparse econometric models
- Supervisor: Sébastien Van Belleghem
- Started: 2016
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Valerio Serse

- Title: Heterogeneity and taxation
- Supervisor: Jean Hindriks
- Started: 2016
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Yu Sun

- Title: Sustainable economic growth and uncertainty
- Supervisor: Thierry Bréchet
- Started: 2015
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Akylai Taalaibekova (ExSide Student)

- Title: Diffusion of opinions and innovations among limitedly forward-looking individuals
- Supervisors: Vincent Vannetelbosch And Michael Grabisch
- Started: 2017
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium and Université Paris 1 Panthéon-Sorbonne, France

Lorenzo Tondi

- Title: Optimal copyright duration
- Supervisor: Paul Belleflamme
- Started: 2018
- Doctoral School: Economics School of Louvain, UCLouvain, Belgium

Sonia Trabelsi

- Title: Geographies of medication in Belgium: Measurements of socio-economic and environmental effects
- Supervisor: Isabelle Thomas
- Started: 2015
- Doctoral School: Sciences, UCLouvain, Belgium

European Doctoral Program in Quantitative Economics

The European Doctoral Program in Quantitative Economics (EDP) is a program of doctoral studies in economics organized jointly by the following universities: UCLouvain (Belgium), Ecole des Hautes Etudes en Sciences Sociales, Paris (France), Rheinische Friedrich-Wilhelms-Universität Bonn (Germany), European University Institute, Florence (Italy), Universitat Pompeu Fabra, Barcelona (Spain), London School of Economics (United Kingdom) with Tel Aviv University (Israel) as an exchange partner. This is done within the framework of the existing degree requirements of these institutions. The aim of EDP is to promote the exchange of doctoral students between these institutions in order for their research training to benefit from their strengths in various areas of quantitative economics. Each institution offers Masters and Ph.D. courses, seminars and workshops, and research supervision. Doctoral students participating in the program do the research work for their dissertation in the institutions of the EDP network. They are required to spend at least 3 months abroad in an EDP institution different from the one where their dissertation will be presented. The program focuses on economic theory, mathematical economics, decision and game theory, econometric theory and methodology, empirical econometrics and applied mathematical economics through the coordinated curriculum based on the activities at Barcelona, Bonn, Florence, London, Louvain-la-Neuve, Paris and Tel-Aviv. It creates the opportunity for students to specialize in almost any major area of quantitative economics and, at the same time, it allows students to integrate different aspects of economics. Moreover, EDP offers unique access to the traditions and current research of these seven institutions. The program started in 1977. Thuc Huan Ha, Erika Pini and Yu Sun are currently staying at CORE under this program.

As part of the European Doctoral Program in Quantitative Economics, The European University Institute of Firenze organized the Jamboree 2018-2019 for thirty-seven students on September 6-7, 2018.

EDP JAMBOREE

Keynote lecture

- Árpád Ábrahám, European University Institute, Firenze, Italy
Climbing the wage ladders: Determining the sources of idiosyncratic wage dynamics and implications for policy

Job market sessions

- ▶ Marta Santamaria, Universitat Pompeu Fabra, Barcelona, Spain
Infrastructure choise and regional growth
- ▶ José Montalbán Castilla, Paris School of Economics, France
Evidence from the Spanish becas

Parallel sessions

PARALLEL SESSION IA

- ▶ Clara Martínez-Toledano, Paris School of Economics, France
Housing exemptions, portfolio composition and housing bubbles
- ▶ Kilian Russ, Rheinische Friedrich-Wilhelms-Universität Bonn, Germany
Evidence from Italian unemployment insurance
- ▶ Chima Simpson-Bell, European University Institute, Firenze, Italy
Public insurance in fiscal federations: Evidence from the US

PARALLEL SESSION IB

- ▶ Marius Kulms, Rheinische Friedrich-Wilhelms-Universität Bonn, Germany
Optimal contract duration with deteriorating productivity
- ▶ Yu Sun, CORE, UCLouvain, Belgium
Longterm decision making under the threat of earthquakes
- ▶ Si Chen, Rheinische Friedrich-Wilhelms-Universität Bonn, Germany

PARALLEL SESSION IIA

- ▶ Carolina Lopez-Quiles Centeno, European University Institute, Firenze, Italy
Deposit insurance and bank risk taking
- ▶ Angelo Luisi, IRES, UCLouvain, Belgium
Assessing the feterminants of hovernment bond yields inside the Euro area

PARALLEL SESSION IIB

- ▶ Ezgi Özsöğüt, Paris School of Economics, France
Income inequality and the current account
- ▶ Daniele Verdini, IRES, UCLouvain, Belgium
Demand shocks, sector-level externalities, and the evolution of the comparative advantage

PARALLEL SESSION IIIA

- ▶ Felix Koenig, London School of Economics, United Kingdom
Superstar earners and market size: Evidence from the entertainment industry

PARALLEL SESSION IIIA (CONT'D)

- ▶ Karol Mazur, University Institute, Firenze, Italy
Sharing risk to avoid tragedy: Theory and application to farming
- ▶ Luis Estevez Bauluz, Paris School of Economics, France
From manufacturing to services: The impact of structural change on the value of housing

PARALLEL SESSION IIIB

- ▶ Erika Pini, CORE, UCLouvain, Belgium
Economic inequality, political polarization and voter turnout
- ▶ Nikolas Schöll, Universitat Pompeu Fabra, Barcelona, Spain
From job polarization to political discontent: The political consequences of technological change
- ▶ Riccardo Turati, IRES, UCLouvain, Belgium
Skill of the immigrants and vote of the natives: Nationalism and immigration in European elections 2007-2016

PARALLEL SESSION IVA

- ▶ Kaspar Zimmermann, Rheinische Friedrich-Wilhelms-Universität Bonn, Germany
The profit credit-cycle
- ▶ Thomas Drechsel, London School of Economics, United Kingdom
Flow-based borrowing constraints and macroeconomic fluctuations
- ▶ Boris Chafwehé, IRES, UCLouvain, Belgium
Endogenous forward guidance

PARALLEL SESSION IVB

- ▶ Andres Barraios, London School of Economics, United Kingdom
Should I stay or should I go? The role of neighbors and siblings in university enrollment
- ▶ Keiti Kondi, IRES, UCLouvain, Belgium
Gender gap, intra household bargaining and sex selective abortion in Albania
- ▶ Egon Tripodi, European University Institute, Firenze, Italy
The spread of social influence: Evidence form a charitable giving experiment

The Innovative Training Network 'Expectations and Social Influence Dynamics in Economics' (ExSIDE)

ExSIDE, as European Joint Doctorate, is an integrative part of Marie Skłodowska-Curie Actions (MSCA) in Horizon 2020. These actions aim to support the career development and training of researchers – with a focus on innovation skills – in all scientific disciplines through international and intersectoral mobility. The European Joint Doctorate has the objective of promoting international, intersectoral and multi/inter-disciplinary collaboration in doctoral-level training in Europe through the creation of joint doctoral programs, leading to the delivery of joint, double or multiple doctoral degrees. Long research stays at both degree granting universities as well as at other partner institutions are an integrative part of the program. These measures contribute in overcoming national, sectoral and interdisciplinary boundaries.

The ExSIDE consortium consists of eight leading European Universities (Universität Bielefeld, Università Ca' Foscari Venezia, Università Cattolica del Sacro Cuore Milano, UCLouvain, Université Paris 1 Panthéon Sorbonne, Universiteit van Amsterdam, University College London and University of Surrey) and nine non-academic partners (Capital Fund Management, Der Nederlandsche Bank, Fair Dynamic Consulting s.r.l., Italian National Institute of Statistics, Oesterreichische Nationalbank, Regione del Veneto - Direzione Lavoro, Talents' Friends GmbH, Vitae and Volterra Partners LLP). Doctoral fellows in ExSIDE are jointly supervised and a joint governance structure with joint admission, selection, supervision, monitoring and assessment procedures of all ExSIDE universities forms the basis of the three year doctoral training.

ExSIDE is coordinated by Universität Bielefeld in Germany. Vincent Vannetelbosch is the supervisor at UCLouvain. The program started in 2017. Fifteen students are currently enrolled.

As part of the ExSIDE, UCLouvain organized the Jamboree 2018-2019 on June 17-19, 2019.

EXSIDE JAMBOREE

Keynote lecture

- Seppo Honkapohja, Aalto University, Helsinki, Finland
Price level targeting with evolving credibility, an example of monetary policy
- Luca Colombo, Università Cattolica del Sacro Cuore Milano, Italy, Pietro Dindo, Università Ca' Foscari, Venezia, Italy, Antoine Mandel, Université Paris 1 Panthéon Sorbonne, France and Ana Mauleon, Université Saint-Louis, Brussels, Belgium
How to write a good paper ?

Thematic sessions

- Aylai Taalaibekova, UCLouvain, Belgium and Université Paris 1 Panthéon-Sorbonne, Paris
Key player in social learning
- Severin Reissl, Università Cattolica del Sacro Cuore Milano, Italy and Universität Bielefeld, Germany
Minsky from the bottom up. Formalising the two-price model of investment in a simple agent-based framework
- Alex Grimaud, Università Cattolica del Sacro Cuore Milano, Italy and Universiteit van Amsterdam, The Netherlands
Heterogeneous price setting and the Phillips curve
- Fen Li, Université Paris 1 Panthéon-Sorbonne, France and Universität Bielefeld, Germany
The dynamics of cultural traits and social networks
- Mariam Nanumyan, Universität Bielefeld, Germany and UCLouvain, Belgium
Union formation in network spill-over games
- Frieder Neunhoeffer, Università Ca' Foscari, Venezia, Italy and Universiteit van Amsterdam, The Netherlands
Time pressure in long run learning-to-forecast experiments
- Roberta Terranova, Universität Bielefeld, Germany, University of Surrey and University College London, United Kingdom
Investor sentiment and M&A
- Enrico Maria Turco, Universiteit van Amsterdam and Università Cattolica del Sacro Cuore Milano, Italy
Macro-finance agent-based model with heterogeneous expectations
- Chenghong Luo, UCLouvain, Belgium and Università Cattolica del Sacro Cuore Milano, Italy
Coalition-proof stable networks
- Erdenebulgan Damdinsuren, Universität Bielefeld, Germany and Università Cattolica del Sacro Cuore Milano, Italy
On the optimal composition of heterogeneous firms in the labour market with on-the-job system
- Thanh Son Pham, University of Surrey, United Kingdom and Universität Bielefeld, Germany
Mandates for monetary policy in a new Keynesian behavioural framework
- Fernando Garcia Alvarado, Università Ca' Foscari, Venezia, Italy and Université Paris 1 Panthéon-Sorbonne, France
The worldwide network of tax evasion: Evidence from the Panama papers
- Alessandro De Sanctis, Université Paris 1 Panthéon Sorbonne, France and Università Cattolica del Sacro Cuore Milano, Italy
Non-performing loans, system risk and resilience in financial networks

3rd Doctoral Workshop on the Economics of Digitization

This 2-day international workshop is a joint initiative of UCLouvain, Ifo Institute for Economic Research, Liege Competition and Innovation Institute, Telecom Paris Tech and Toulouse School of Economics. It was hosted by Université Catholique de Louvain in Louvain-la-Neuve on May 3 and 4, 2019 and gathered doctoral students involved in research in the field of the Economics of Digitization.

Keynote lecture

- Catherine Tucker, Massachusetts Institute of Technology, Cambridge, USA
Algorithms bias: The role of economics

Invited lecture

- Christian Zimmerman, Federal Reserve Bank of St. Louis, USA
REPEC as a source of research data

Thematic lectures

SESSION 1: POLICY

- Tobias Lohse, Ifo Institute for Economic Research, München, Germany
Online shopping and retail employment: Evidence from brick-and-mortar bookstores
- José Lamesch, Université de Liège, Belgium
Mergers in the digital economy
- Fabrizio Ciotti, CORE, UCLouvain, Belgium
Dominant platform and strategic sponsorship

SESSION 2: SHARING ECONOMY

- Angela Muñoz, Telecom ParisTech, France
Gender-specific benefits from ride-hailing apps: Evidence from Uber's entry in Chile
- Afi-Rafah Rossi, Toulouse School of Economics, France
The price is right!
- Vladimir Pavlov, The Wharton School, Philadelphia, USA
Price manipulation in peer-to-peer markets

SESSION 3: TWO-SIDED PLATFORMS

- Pauline Affeldt, DIW, Berlin, Germany
Estimating demand with multi-homing in two-sided markets
- Adrien Raizonville, Telecom ParisTech, France
Cooperation in two-sided markets

SESSION 4: DATA MARKETS

- Francesco Clavò Braulin, Università di Bologna, Italy
The effects of personal information on competition: Parity price discrimination and consumer privacy
- Bastian Haberer, Universität Passau, Germany
Standing on the shoulders of web giants: The economic effects of personal data markets

SESSION 5: MEDIA

- Federico Trombetta, University of Warwick, United Kingdom
The newsroom dilemma. Media competition, speed and the quality of journalism
- Luis Martins Abreu, Toulouse School of Economics, France
Homophily in social media and news polarization
- Anna Kerckhof, Universität zu Köln, Germany
Advertising and content differentiation: Evidence from Youtube

SESSION 6: REPUTATION

- Michelangelo Rossi, Universidad Carlos III, Madrid, Spain
How does competition affect reputation concerns? Theory and evidence from Airbnb
- Nicolas Eschenbaum, University of St. Gallen, Switzerland
Dealing with uncertainty: The value of reputation in an institutional void

PhD Course on Volatility Modeling

This short-course was given by Prof. Tim Bollerslev (Duke University, USA), whose research has been at the forefront of these developments. He presented an overview of the topic "**Volatility Modeling**," starting from basic ARCH/GARCH type models all the way to more recent realized volatility-based procedures. The course took place at the National Bank of Belgium in Brussels. Three participants had the possibility to present their research work in the presence of the speaker.

Doctoral Workshops

The doctoral workshops provide a research forum where members of the Doctoral Program in Economics at UCLouvain have the opportunity to present part of their completed or ongoing research. Even though presentations are reserved for doctoral students, access to the workshop is open to a larger public. Professors and researchers from partner institutions are invited to attend all sessions. Doctoral students from UCLouvain, UNamur, Université Saint-Louis, Brussels, Université libre de Bruxelles, Université de Liège, Universiteit Gent and KU Leuven are invited to attend the sessions and present their research.

WINTER SESSION 2018, UNAMUR

Keynote lecture

- Rajiv Sethi, Columbia University, USA
The geography of lethal force

Parallel sessions

PARALLEL SESSION A

- Rodrigo Londono, Université Saint-Louis, Brussels, Belgium
Hub and spoke cartels: A descriptive research
- **Thuc Huan Ha**, CORE, UCLouvain, Belgium
Servitization as a sustainable business model? An economic analysis
- Francesco Pascucci, IRES, UCLouvain, Belgium
The rise of the added worker effect: Are markets more incomplete?

PARALLEL SESSION B

- Henri Vanhomwegen, UNamur, Belgium
Concentration, mutual funds performance and (systemic) risk
- Joey Soudant, UNamur, Belgium
Monetary policy and spillovers on financial assets: Evidence from large TVP-VAR

PARALLEL SESSION C

- François-Xavier Ledru, UNamur, Belgium
Are impact and socially responsible investing different investment strategies?
- Bitat Abdelfeteh, Université Saint-Louis, Brussels, Belgium
Eco-innovation and business competitiveness

PARALLEL SESSION D

- Modeste Dayé, UNamur, Belgium
A behavioral model of poor microentrepreneurs' savings and borrowing choices
- Stefano Falcone, Université libre de Bruxelles, Belgium
The social cost of technological innovation: Improved soy seeds and land invasions in Brazil
- Alami Anousheh, Université Saint-Louis, Brussels, Belgium
Drugs, violence and human capital in the context of natural disasters: Evidence from Mexico

SPRING SESSION 2019, UCLouvain

Keynote lecture

- Javier Garcia-Cicco, Central Bank of Argentina, Argentina
Revisiting the exchange rate pass through: A general equilibrium perspective

Thematic lectures

POPULATION ECONOMICS

- Fabio Blasutto, IRES, UCLouvain, Belgium
Catholic censorship and the demise of knowledge production in early modern Italy
- Arnaud Deseaau, Université Saint-Louis, Brussels, Belgium
Convergence and divergence: Evidence from Malthusian times
- Annalisa Frigo, IRES, UCLouvain, Belgium
Coping strategies of ageing (would-be) parents and the scope for assisted reproductive technologies

GAME THEORY

- Sylvain Funck, CORE, UCLouvain and Université Saint-Louis, Brussels, Belgium
Matching with couples with farsighted agents
- **Mariam Nanumyan**, CORE, UCLouvain, Belgium
Union formation in network spill-over games
- **Jérôme Dollinger**, CORE, UCLouvain, Belgium
Radicalisation of social norms

PUBLIC AND POLITICAL ECONOMY

- Antoine de Mahieu, Université Saint-Louis, Brussels, Belgium
Van Soest labor supply models to estimate effects of tax-benefit reforms on Belgian labor market
- **Erika Pini**, CORE, UCLouvain, Belgium
Economic inequality, political polarization and voter turnout: An empirical study

INTERNATIONAL TRADE AND INNOVATION

- Daniele Verdini, IRES, UCLouvain, Belgium
Cutting the ties: Globalization and the evolution of the urban-rural employment linkages

INTERNATIONAL TRADE AND INNOVATION (CONT'D)

- Luca Faré, UNamur, Belgium
Innovation and financing access: Are entrepreneurial SMEs different?
- Baptiste Souillard, Université libre de Bruxelles, Belgium
Competition and corporate tax avoidance: Evidence from the China shock

MACROECONOMICS

- François Courtoy, UCLouvain, Belgium
Optimal fiscal policy in a TANK model
- Boris Chafwehe, IRES, UCLouvain, Belgium
Endogenous forward guidance
- Charles de Beaufort, IRES, UCLouvain, Belgium
Optimal fiscal and monetary policy with expectations management
- Guillermo Santos, IRES, UCLouvain, Belgium
Constrained efficiency in a model with sovereign default and heterogeneous agents

DEVELOPMENT ECONOMICS

- Léo Czajka, IRES, UCLouvain, Belgium
Wage distribution in Senegal: A preliminary exploration
- Manuel Clarice, UNamur, Belgium
International migration and education in Nepal
- Alamir Anousheh, Université libre de Bruxelles, Belgium
Security, disaster management or schooling? Consequences of the Mexican war on drugs

ECONOMICS OF MIGRATION

- Ricardo Turati, IRES, UCLouvain, Belgium
The cultural effect of emigration: Global evidence at the origin countries
- Hendrik Scheewel, IRES, UCLouvain, Belgium
Immigration, welfare and inequality: How much does the labor market specification matter?
- Adam Levai, IRES, UCLouvain, Belgium
The impact of international migration on workers protection of the natives
- Yannik Schenk, IRES, UCLouvain, Belgium
Migration accounting in the post-WWII period: The role of conflictis, economic and demographic forces

INDUSTRIAL ORGANIZATION

- Thuc Huan Ha, CORE, UCLouvain, Belgium
Peer-to-peer sharing vs secondhand market: Implications on the manufacturing firm of durable goods
- Fabrizio Ciotti, CORE, UCLouvain, Belgium
Online news provision and strategic sponsorship
- Lorenzo Tondi, CORE, UCLouvain, Belgium
Music production without copyright protection

Brown Bag Seminar Series

A noteworthy initiative of the junior researchers was the launch of CORE Brown Bag seminar series in October 2014, where junior researchers from CORE and occasionally from other institutions, present their current work or job market paper and obtain valuable feedback in a dedicated and friendly atmosphere.

- September 25, 2018
Andras Gregor, CORE, UCLouvain, Belgium
The effects of electoral formula on public finances evidence from Hungarian municipalities
- October 10, 2018
Giang Nguyen, Pennsylvania State University, USA
Price discovery of a speculative asset: Evidence from a bitcoin exchange
- October 24, 2018.
Paul Belleflamme, CORE, UCLouvain, Belgium
Network effects in crowdfunding October 31, 2018
Seyed Hassan Nosratabadi, CORE, UCLouvain, Belgium
Revealed referenced preferences
- November 7, 2018
Leonardo Madio, CORE, UCLouvain, Belgium
Data brokers co-opetition
- November 14, 2018
Angelo Luisi, LFIN, UCLouvain, Belgium
Redenomination risks and Euro area government bond market fragmentation
- November 21, 2018
Simon Schopohl, CORE, UCLouvain and Université Saint-Louis, Brussels, Belgium
Who matters in coordination problems on networks?
- November 28, 2018
Valerio Serse, CORE, UCLouvain, Belgium
The heterogeneous impact of sugar taxes on cola demand across different household types
- December 12, 2018
Shiva Shekhar, Compass Lexecon, Brussels, Belgium
Superstars in two-sideid markets: Exclusives or not?
- February 6, 2019
Elias Carroni, Università di Bologna, Italy
Signaling quality when consumers are salient thinkers
- February 27, 2019
Mariam Nanumyan, CORE, UCLouvain, Belgium
Efficiency gains of social influence in a minimum effort game
- March 13, 2019
Fernando Garcia Alvarado, Ca' Foscari University of Venice and Université Paris 1 Panthéon-Sorbonne, France
Network effects in an Agent-Based Model of tax evasion with social influence fragmentation
- March 20, 2019
Fabrizio Ciotti, CORE, UCLouvain, Belgium
Online new provision and strategic sponsorship
- March 27, 2019
Anwesha Banerjee, Aix-Marseille School of Economics, France
Risk, heterogenous returns and cooperation: an experimental inquiry
- April 3, 2019
Bart Capéau and Zoé Rongé, KU Leuven, Belgium
(Almost) all you wanted to know about individual well-being in Belgium: It's in the MEqin-data
- April 24, 2019
Sylvain Funck, CORE, UCLouvain and Université Saint-Louis, Brussels, Belgium
Matching couples with farsighted agents
- May 15, 2019
Antoine Dubus, Telecom ParisTech, France
Selling strategic information in digital competitive markets
- May 29, 2019
Ata Atay, Hungarian Academy of Sciences, Budapest, Hungary
On the core of many-to-many matching markets with transfereable utility

4

- › [RESEARCH VISITORS](#)
- › [SCIENTIFIC MEETINGS](#)
- › [WEEKLY CORE SEMINARS](#)
- › [PARTICIPATION OF CORE MEMBERS IN MEETING ORGANIZATIONS](#)
- › [PARTICIPATION OF CORE MEMBERS TO CONFERENCES AND SEMINARS](#)

SCIENTIFIC EXCHANGES AND COLLABORATIONS

SCIENTIFIC EXCHANGES AND COLLABORATIONS

Research Visitors

AFFILIATE MEMBERS

CORE can count on the precious support of its affiliate members who are researchers and academics from outside UCLouvain that are contributing to the CORE scientific environment and domains of expertise.

- Rabah Amir, University of Iowa, USA
- Paul Champsaur, Arceps, France
- Bernard Cornet, Université Paris 1, France
- Koen Decancq, Universiteit Antwerpen, Belgium
- Jean-Charles Delvenne, EPL, UCLouvain, Belgium
- Axel Gautier, Université de Liège, Belgium
- Michel Goemans, Massachusetts Institute of Technology, Cambridge, USA
- Adel Hatami-Marbini, De Monfort University, United Kingdom
- Elhanan Helpman, Harvard University, USA
- Jean-Jacques Herings, Universiteit Maastricht, The Netherlands
- Michel Lebreton, Toulouse School of Economics, France
- Marie-Louise Leroux, Université du Québec à Montréal, Canada
- Dunia Lopez Pintado, Universidad Pablo de Olavide, Seville, Spain
- Pascal Mossay, Newcastle University, United Kingdom
- George Nemhauser, Georgia Institute of Technology, Atlanta, USA
- Rigas Oikonomou, IRES, UCLouvain, Belgium
- Dimitri Paolini, Università degli Studi di Sassari, Italy
- Pierre Picard, Université du Luxembourg, Luxembourg
- Yves Pochet, PURATOS, Dilbeek, Belgium
- Heracles Polemarchakis, University of Warwick, United Kingdom
- Arie Preminger, Ben-Gurion University of the Negev, Israel
- Ernesto San Martín, Pontificia Universidad Católica de Chile, Santiago, Chile
- Erik Schokkaert, KU Leuven, Belgium
- Jose J. Moneris, Universidad de Valencia, Spain
- Jean-François Richard, University of Pittsburgh, USA
- Vladimir Shikhman, Technische Universität Chemnitz, Germany
- Joe Tharakan, Université de Liège, Belgium
- Giacomo Valletta, EDHEC Business School, Roubaix, France
- Dirk Van de Gaer, Universiteit Gent, Belgium
- Xavier Wauthy, Université libre de Bruxelles, Belgium
- Shlomo Weber, New Economic School, Moscow, Russia

SHORT TERM VISITORS

CORE benefited from the visit of a number of scholars whose stays ranged from a few days to a few months. Among them:

- Andreu Arenas, Barcelona Institute of Political Economy and Governance, Spain
- Ata Atay, Hungarian Academy of Science, Budapest, Hungary
- Julia Salom Carrasco, Universitat de València, Spain
- Alessandra Costa, Università degli Studi di Messina, Italy
- Maria del Mar Racionero, The Australian National University, Canberra, Australia
- Eric Delmelle, University of North Carolina at Charlotte, USA
- Daniel De Wolf, Université du Littoral Côte d'Opale, Dunkerque, France
- Antoine Dubus, Telecom ParisTech, France
- Lyudmila Egorova, National Research University Higher School of Economics, Moscow, Russia
- Mihai Florea, Aalto University, Helsinki, Finland
- Werner Hildenbrand, Rheinische Friedrich-Wilhelms-Universität Bonn, Germany
- Marion Leturcq, Institut National d'Etudes Démographiques, Paris, France
- Marco Loparic, Engie, Louvain-la-Neuve, Belgium
- Ion Necoara, Politehnica University of Bucharest, Roumania
- Alain Pholo Bala, Johannesburg University, South Africa
- Vladimir Protasov, National Research University Higher School of Economics, Moscow, Russia
- John Roemer, Yale University, USA
- Marco Rogna, Free University of Bozen-Bolzano, Germany
- Margarita Samartin, Universidad Carlos III de Madrid, Spain
- Robert Somogyi, Budapest University of Technology and Economics, Hungary
- Sebastian Stich, Ecole Polytechnique Fédérale de Lausanne, Switzerland
- Cécile Tannier, Université de Franche-Comté, Besançon, France
- Adrien Taylor, INRIA and Ecole Normale Supérieure, Paris, France
- Jorge R. Vera Andreo, Pontificia Universidad Católica de Chile, Santiago, Chile

Scientific meetings

CORE NOBEL TALK: BENGT HOLMSTRÖM, NOBEL PRIZE LAUREATE IN ECONOMICS

As part of the CORE Nobel Talks, Prof. Bengt Holmström (Massachusetts Institute of Technology, USA) gave a seminar on «The Purpose and Perils of Money Markets – Lessons from the Financial Crisis». The seminar was held at UCLouvain on October 17, 2018.

Bengt Holmström is an internationally renowned scholar for his work on principal-agent theory. In 2016, he was awarded the Sveriges Riksbank Nobel Prize in Economic Sciences in memory of Alfred Nobel for his contributions to contract theory.

CONFERENCE ON PENSION REFORMS IN EUROPE

The purpose of this conference was to provide international comparisons of the pension reforms across Europe with an external and well-informed view of a world-renowned expert: Professor Peter Diamond (2010 Nobel Prize Laureate in Economics).

This event took place in Louvain-la-Neuve on November 9, 2018 and was part of the interdisciplinary ARC-SAS pension 2018-2023 project.

Keynote Lecture

- ▶ Peter Diamond, Massachusetts Institute of Technology, USA
Pension design innovation

Thematic Lectures

POINT SYSTEMS REFORMS

- ▶ Jean Hindriks, CORE, UCLouvain, Belgium
Pension reform in Belgium
- ▶ Didier Blanchet, INSEE, Paris, France
Pension reform in France
- ▶ Axel Börsch-Supan, Max Planck Institute for Social Law and Social Policy, München, Germany
Pension reform in Germany

THE NDC REFORMS

- ▶ Edward Palmer, Uppsala University, Sweden
Pension reform in Sweden
- ▶ Tito Michele Boeri, Università Bocconi, Italy
Pension reform in Italy

THE NDC REFORMS (CONT'D)

- ▶ Agnieszka Chlon-Dominczak, Warsaw School of Economics, Poland
Pension reform in Poland

OTHER PENSION REFORMS

- ▶ Nicholas Barr, London School of Economics, United Kingdom
Pension reform in United Kingdom
- ▶ Roel Beetsma, Universiteit van Amsterdam, The Netherlands
Pension reform in The Netherlands
- ▶ Javier Diza-Giménez, Universidad de Navarra, Spain
Pension reform in Spain

KRONOS GROUP CHAIR: PROCUREMENT REVOLUTION 4.0: SKILLS AND CAPABILITIES FOR THE FUTURE

As part of the Kronos Group Chair, Louvain School of Management and CORE organized the «Procurement Revolution 4.0: Skills & Capabilities for the Future» Workshop in Louvain-la-Neuve on November 29, 2018.

Program

- ▶ Constantin Blome, Chairholder, CORE, UCLouvain, Belgium and University of Sussex, United Kingdom
How to transform the procurement organization
- ▶ Grégory Allard, Head of Procurement Practice@Kronos Group
The procurement 4.0 journey: The case of Etex
- ▶ Kronos Group Partners
Kronos group procurement academy
- ▶ Roundtable discussions and networking exchange

CONFERENCE: «EN FAUT-IL PEU POUR ÊTRE HEUREUX ?»

Are happiness and satisfaction with life good well-being indices? This question has motivated colleagues from KU Leuven, UCLouvain, ULBrussels and UAntwerp to build a representative dataset of the Belgian population in order to compute and compare several well-being indices. This dataset also allows researchers to measure well-being at the individual rather than household level, which makes it possible to evaluate inequality within households. The well-being index that the authors favor is the equivalent income, which is a way to account for the subjective loss in well-being associated to shortcomings that people see in the non-financial dimensions of their life, such as their health, their job situation and their housing.

The authors presented their book on January 16, 2019 at the Fondation Universitaire, Brussels.

Program

- Presentation of the book «En faut-il peu pour être heureux? Conditions de vie, bonheur et bien-être en Belgique» by the authors
- Comments by Philippe Van Parijs, UCLouvain, Belgium
- Comments by Bea Cantillon, Universiteit Antwerpen, Belgium
- Open questions and intervention from the audience

BRU-NET WORKSHOP ON SPATIAL BIG DATA IN URBAN ENVIRONMENTS. WHAT DO THEY UNVEIL (AND HIDE) IN THE CASE OF BRUSSELS?

The seminar discussed the contribution of spatial big data and their relevance to urban studies. It was an opportunity to highlight the conclusions of the four-year interdisciplinary Bru-Net research project, which focused in particular on the case of Brussels (Bru-) through the prism of different types of interaction networks (-Net).

What are the challenges about spatial big data today in urban studies? What are the advantages and the limits of these new data, in terms of thematic results and methodological aspects? Do these new spatialized data make it possible to better understand the structures and dynamics of cities with regard to mobility and transportation, infrastructure, and built-up features?

Scientific presentations and discussions by researchers of different profiles allowed to learn and discussed about the results obtained during the research project, while creating a space for debate between scientists from various disciplines and experts coming from the public and the private sector.

The seminar took place in Louvain-la-Neuve on March 1, 2019.

Morning sessions

INTRODUCTION

- **Isabelle Thomas**, CORE, UCLouvain, Belgium
Introduction about the Bru-Net project

TOPIC 1: NEW SPATIAL DATA BASES, BIG-DATA AND COMMUNITY DETECTION

- **Denise Pumain**, Université Paris 1 Panthéon Sorbonne, France
Social Sciences between big data and artificial intelligence
(Invited speaker)
- **Arnaud Adam**, CORE, UCLouvain, Belgium
Detecting communities with the multiscale Louvain method: Robustness test on the metropolitan area of Brussels
(Team-member presentation)

TOPIC 2: MOBILITY AND TRANSPORTATION IN REGIONAL AND URBAN GEOGRAPHY

- **Eric Cornelis**, UNamur, Belgium
Daily mobility and activity chains: From observation to forecasting through models
(Invited speaker)

TOPIC 2: MOBILITY AND TRANSPORTATION IN REGIONAL AND URBAN GEOGRAPHY (CONT'D)

- **Olivier Finance**, CORE, UCLouvain, Belgium
Observing goods exchanges in Belgium through trucks movements: the Viapass dataset
(Team-member presentation)

TOPIC 3: SPATIAL ANALYSIS IN URBAN MORPHOLOGY

- **Giovanni Fusco**, Université Côte d'Azur, Nice, France
The contemporary city mirrored by its form. A research agenda for geographers and planners
(Invited speaker)
- **Gaëtan Montero**, CORE, UCLouvain, Belgium
Revisiting urban models with ICT data ? Some examples from Brussels
(Team-member presentation)

Afternoon sessions

- **Olivier Finance** and **Arnaud Adam**, CORE, UCLouvain, Belgium
Trucks circulations and exchanges of goods in Belgium and Brussels
- **Olivier Finance**, UCLouvain, Belgium
Presentation of atlas.brussels
- **Arnaud Adam**, CORE, UCLouvain, Belgium
On the use of mobile phones to classify and characterize space
- **Olivier Finance**, CORE, UCLouvain, Belgium
About the relevancy of uncleaned data

Final roundtable

- Eric Cornelis, Giovanni Fusco, Denise Pumain, Mathieu Strale, Cécile Tanier and **Isabelle Thomas**
New data, new methodologies, new challenges

4TH BELGIAN-JAPANESE PUBLIC FINANCE WORKSHOP

Professors **Jean Hindriks** (CORE, UCLouvain) and **Pierre Pestieau** (Université de Liège and CORE, UCLouvain), together with a group of academics of Osaka University (Japan), have decided to renew the annual meeting in public finance between Japan and Belgium. The workshop was held at CORE in Louvain-la-Neuve on March 8-9, 2019.

The purpose was twofold:

- Build a bridge between economists at UCLouvain and Osaka University to exchange academics and doctoral students;
- Promote collaboration between Belgian and Japanese economists, notably in the area of public economics in which CORE has a long standing reputation.

Program

- Daiji Kawaguchi, Tokyo University, Japan
It's in your genes: How genes explain alcohol consumption and labor-market outcomes
- Ana Gouveia, Universidade Nova de Lisboa, Portugal
Effects of a temporary investment tax credit in a periphery eurozone country
- Yukihiro Nishimura, Osaka University, Japan
Old age or dependence. Which social insurance ?
- Susana Peralta, Universidade Nova de Lisboa, Portugal
Can property taxes increase fertility? Quasi-experimental evidence from Portugal
- Motohiro Sato, Hitotsubashi University, Japan
Property tax and land use: Evidence from the 1990s reforms in Japan
- Skerdi Zanaj, Université du Luxembourg, Luxembourg
Tax havens compliance with international standards: A temporal perspective
- Hiromi Hara, Japan Women's University, Tokyo, Japan
Should home economics be compulsory for boys? Overcoming traditional social norms
- Mathieu Lefebvre, Université de Strasbourg, France
Missing poors in the US
- Kozo Kiyota, Keio University, Japan
Intermediate goods-skill complementarity
- Jean-Marie Lozachmeur, Toulouse School of Economics, France
Catching them young: early childhood care, human capital and tax policy

Weekly CORE seminars

ECONOMETRICS SEMINARS

- October 8, 2018
Anh Le, Pennsylvania State University, USA
Tractable term-structure models and the zero lower bound
- October 12, 2018
Anh Le, Pennsylvania State University, USA
The structure of risks in equilibrium affine models of bond yields
- October 19, 2018
Thomas Lambert, Erasmus Universiteit, Rotterdam, The Netherlands
Winning connections? Special Interests and the sale of failed banks
- November 23, 2018
Andrea Vedolin, Boston University, USA
Central bank communication and the yield curve
- March 22, 2019
Agostino Capponi, Columbia University, New York, USA
Bails-ins and bail-outs: Incentives, connectivity, and systemic stability
- April 5, 2019
David Preinerstorfer, Université libre de Bruxelles, Belgium
Enhancing power in asymptotic and finite sample frameworks

OPERATIONS RESEARCH SEMINARS

- September 4, 2018
 Sebastian Stich, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Communication efficient variants of SGD for distributed computing
- September 11, 2018
 Ion Necoara, Politehnica University of Bucharest, Roumania
Stochastic algorithms for convex feasibility and convex minimization
- October 16, 2018
 Juan Miguel MoralesGonzalez, Universidad de Malaga, Spain
Power demand forecasting and demand-side bidding via data-driven inverse optimization
- October 26, 2018
 Eric Delmelle, University North Carolina, Charlotte, USA
Controlling excess travel and assignment switches in school location
- November 20, 2018
 Daniel Dadush, Centrum Wiskunde & Informatica, Amsterdam, The Netherlands
A friendly smoothed analysis of the simplex method
- November 20, 2018
 Allreza Tahbaz-Salehi, Northwestern University, Evanston, USA
Supply chain disruptions: Evidence from the great East Japan Earthquake
- November 27, 2018
 David Wozabal, Technische Universität München, Germany
The value of coordination in multimarket bidding of electricity storage
- December 4, 2018
 Dieter Weninger, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Exact approaches and heuristics for solving mixed-integer time-space network problems
- December 12, 2018
 Colin Jones, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Predictive dispatch and demand response for commercial buildings
- February 4, 2019
 Swati Gupta, Georgia Institute of Technology, Atlanta, USA
Convex optimization over submodular polytopes
- February 5, 2019
 Silva Villa, Università degli Studi di Genova, Italy
Iterative regularization using proximal methods
- March 12, 2019.
 Ronald Hildebrand, Université Grenoble Alpes, France
Towards an optimal barrier on arbitrary convex cones
- March 26, 2019.
 Timothy Douglas Mount, Cornell University, USA
The role of distributed storage in electricity markets in the USA: Research versus practice
- April 2, 2019
 Erling Andersen, MOSEK, Copenhagen, Denmark
A primal-dual interior-point algorithm for non symmetric conic optimization
- April 23, 2019
 Andy Philpott, University of Auckland, New Zealand
Efficiency of markets with hydroelectricity
- May 21, 2019
 Vladimir Protasov, National Research University Higher School of Economics, Moscow, Russia
The maximal acyclic subgraph problem and stability of positive dynamical systems
- May 28, 2019
 Eddie Anderson, The University of Sydney, Australia
Robust sample average approximation with small sample sizes
- June 11, 2019
 Jorge Vera Andreo, Pontificia Universidad Católica de Chile, Santiago, Chile
Using condition and geometric measures to improve intertemporal consistency in 2-stage decision problems
- June 19, 2019
 Josh Taylor, Université de Toronto, Canada
Optimal planning and control of direct current lines in power systems

UCLouvain ECONOMICS SEMINARS

- September 20, 2018
 Axel Börsch-Supan, Technische Universität München, Germany
Myths, scientific evidence and economic policy in an aging world
- October 4, 2018
 Valérie Lechene, University College London, United Kingdom
A structural analysis of the decline of home cooked food
- October 11, 2018
 Régis Renault, Université de Cergy-Pontoise, France
Search direction: Position externalities and position bias
- October 18, 2018
 Gianmarco Ottaviano, London School of Economics, United Kingdom and Università di Bologna, Italy
Appropriability of intellectual assets and the organization of global supply chains
- November 8, 2018
 Mike Elsby, University of Edinburgh, United Kingdom
Male joblessness in the United States
- November 15, 2018
 Antonio Rosata, University of Sydney, Australia
Projection of private values in auctions
- November 22, 2018
 Nuno Coimbra, Paris School of Economics, France
Financial cycles with heterogeneous intermediaries
- November 29, 2018
 Maarten Bosker, Universiteit Rotterdam, The Netherlands
Shock propagation in global supply chains. Evidence from the US-Vietnam bilateral trade agreement
- December 6, 2018
 Michal Kobierlarz, KU Leuven, Belgium
Unstable monetary unions. The role of expectations and past experience
- February 7, 2018
 Sascha Becker, Warwick University, United Kingdom
Effects of catholic censorship during the counter-reformation

- February 14, 2019
Matteo Cervellati, Università di Bologna, Italy
Sovereign polities and pre-industrial development: Theory and evidence for Europe 1000-1850
- February 21, 2019
Botond Köszegi, Central European University, Budapest, Hungary
An attention-based theory of mental accounting
- February 28, 2019
Sandy Tubeuf, UCLouvain and University of Leeds, United Kingdom
(In-)equality of opportunity in the allocation of R&D resources for rare diseases
- March 7, 2019
Matthias Doepke, Northwestern University, Evanston, USA
Employment protection, investment in job-specific skills, and inequality trends in the United States and Europe
- March 12, 2019
John Roemer, Yale University, USA
How we cooperate: A theory of Kantian optimization
- March 14, 2019
Regina Riphahn, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Employment effects of payroll tax subsidies
- March 21, 2019
Gianluca Orefice, CEPII, Paris France
Immigration and worker-firm matching
- March 28, 2019
Ferdinand Vieider, Universiteit Ghent, Belgium
Environmental factors shape risk preferences
- April 4, 2019
James Fenske, Warwick University, United Kingdom
Pre-colonial warfare and long-run development in India
- April 11, 2019
Chiara Farronato, Harvard Business School, USA
Consumer protection in an online world: An analysis of occupational licensing
- May 2, 2019
Alessandro Sommacal, Università Verona, Italy
Flax tax reforms in Italy through the lens of an heterogeneous agents OLG model
- May 16, 2019
Pietro Biroli, Universität Zürich, Switzerland
Genetics and health insurance: How genes and insurance status affect smoking decisions after health shocks
- May 23, 2019
Sydney Ludvigson, New York University, USA
How wealth was won: Shares as market fundamentals

Participation of CORE members in meeting organizations

- UECE Lisbon Meetings 2018: Game Theory and Applications**, Technical University of Lisbon, Portugal, October 2018
CORE member of the program committee: Ana Mauleon
- Procurement Revolution 4.0: Skills and Capabilities for the Future**, Kronos Group Chair Workshop, CORE, UCLouvain, Belgium, November 2018
CORE organizers: Per Agrell and Constantin Blome
- Conference «Pension Reforms in Europe»**, UCLouvain, Belgium, November 2018
CORE organizer: Jean Hindriks
- 13th Workshop on Economic Design and Institutions**, Université Saint-Louis, Brussels, Belgium, December 2018
CORE organizers: Ana Mauleon and Vincent Vannetelbosch
- Financial Research Seminar**, National Bank of Belgium, March 2019
CORE organizer: Leonardo Iania
- 4th Belgian-Japanese Public Finance Workshop**, CORE, UCLouvain, Belgium, March 2019
CORE Organizer: Jean Hindriks
- Bru-Net Workshop : Spatial Big Data in Urban Environments. What do they Unveil (and Hide) in the Case of Brussels**, Louvain-la-Neuve, Belgium, March 2019
CORE organizers: Arnaud Adam, Olivier Finance and Isabelle Thomas
- Atelier Personalized Medicine: Legal and Economic Analyses in a Fast-changing field**, Montréal, Canada, March 2019
CORE organizer: Marie-Louise Leroux
- 3rd Doctoral Workshop on the Economics of Digitization**, CORE, UCLouvain, Belgium, May 2019
CORE organizers: Paul Belleflamme and Axel Gautier
- 10th Workshop on Institutions, Individual Behavior and Economic Outcomes**, Alghero, Sardinia, June 2019
CORE organizer: Dimitri Paolini
- 19th Annual SAET (Society for the Advancement of Economic Theory) Conference**, Ischia, Italy, June - July 2019
CORE member of the program committee: Claude d'Aspremont
- ExSide Second Jamboree**, CORE, UCLouvain, Belgium, June 2019
CORE organizer: Vincent Vannetelbosch
- 72nd European Meeting of the Econometric Society**, University of Manchester, United Kingdom, August 2019
CORE member of the program committee: Ana Mauleon

Participation of CORE members to conferences and seminars

Per Agrell

- *Benchmarking, incentives and regulatory instruments in health care provision.*
 - 10th Health Policy Workshop: Benchmarking Nursing Homes, Dutch Healthcare Authority NZa and CPB Netherlands Bureau for Economic Policy Analysis, Den Haag, The Netherlands, November 2018
- *Future revenue regulation: European insights*
 - Swedish Electricity Networks Days (Elnätsdagarna), Stockholm, Sweden, November 2018
- *Liner ship fleet deployment models and the cost of time: The case of the China-USA maritime routes*
 - 20th International First Conference on the Yangtze-River Research and Innovation Belt, Shejiang University, Zoushan, China, December 2018
- *The cost of regulatory decentralization: Social cost and criteria*
 - TECR Conference, Université de Liège, Belgium, March 2019

Luc Bauwens

- *Nonlinearities and regimes in conditional correlations with different dynamics*
 - CREST, Paris, France, January 2019 (Econometrics Seminar)

Paul Belleflamme

- *Platform competition: Who benefits from multi-homing?*
 - Taxation and Regulation in the Digital Economy, Norwegian Center for Taxation and Center for Business Economics, Bergen, Norway, October 2018
- *Competitive imperfect price discrimination and market power*
 - 3^{ème} Conférence Annuelle de l'Association Française d'Economie du Droit (AFED), Université de Nancy, France, October 2018
 - Université du Luxembourg, Luxembourg, January 2019
 - Office of Communications, London, United Kingdom, February 2019
 - CERN, Mines ParisTech, Paris, France, March 2019
- *Network effects in crowdfunding*
 - BETA, Université de Nancy, France, October 2018
- *Tax incidence on two-sided platforms*
 - Expert Working Seminar on «Taxation of Digital Platforms», Brussels, Belgium, March 2019
- *Big data, AI and differential pricing*
 - Workshop on the Economics of Artificial Intelligence and Data, European Commission, Brussels, Belgium, May 2019
 - Conference TILting Perspectives 2019: «Regulating a World in Transition», Universiteit Tilburg, The Netherlands, May 2019
- *Data sharing platforms*
 - 1st International Workshop in Law & Economics: Open Innovation
 - Université de Grenoble, France, June 2019
- *Price disclosure by two-sides platforms*
 - 10th Workshop on Institutions, Individual Behavior and Economic Outcomes, Alghero, Sardinia, June 2019

Gilles Bertrand

- *Optimization of trading strategies in continuous intraday markets*
 - 15th International Conference on Stochastic Programming, Norwegian Institute of Science and Technology, Trondheim, Norway, July 2019
- *Adaptive trading in the continuous intraday electricity markets*
 - IEEE Power & Energy Society General Meeting, Atlanta, USA, August 2019

Daniele Catanzaro

- *On the balanced minimum evolution polytope*
 - 30th European Conference on Operational Research (EURO 2019), Dublin, Ireland, June 2019

Philippe Chevalier

- *Joint optimization of variable pricing and supply*
 - INFORMS Annual Conference 2018, Phoenix, USA, November 2018
- *Joint purchasing agreements and information sharing for OEM's*
 - 2019 MSOM International Conference, National University of Singapore, Singapore, June-July, 2019

Fabrizio Ciotti

- *Dominant platform and strategic sponsorship*
 - 9th Edition of the Competition and Innovation Summer School (CISS), Ulcinj, Montenegro, May 2019
- *Platform and strategic sponsorship*
 - 10th Workshop on Institutions, Individual Behavior and Economic Outcomes, Alghero, Sardinia, June 2019

Claude d'Aspremont

- *Rawls et les préférences fondamentales*
 - Atelier «Rawls et les Economistes, Strasbourg, France, March 2019
- *Intergenerational equity under uncertainty*
 - Summer Workshop in Economic Theory (SWET 2019) in Memory of Martine Quinzii, Paris, France, June 2019
- *Approximating oligopolistic competition in a multisectoral context*
 - 19th Annual SAET Conference, Ischia, Italy, June 2019

Pierre Dehez

- *Alternative representation of semivalues, the inverse problem and coalitional rationality*
 - OR-2018, International Conference on Operations Research, Brussels, Belgium, September 2018
- *Approval voting and Shapley ranking*
 - Journée du BETA, Université de Lorraine, Nancy, France, March 2019

Nikita Doikov

- *Complexity of cubically regularized Newton method for minimizing uniformly convex functions*
 - 17th Workshop on Advances in Continuous Optimization (EUROPT 2019), University of Strathclyde, Glasgow, United Kingdom, June 2019
- *Randomized block cubic Newton Method (best paper presentation award)*
 - 2nd Summer School on Optimization, Big Data and Applications (OBA 2019), Veroli, Italy, June 2019

Jérôme Dollinger

- *R&D and market sharing agreements*
 - 24th Coalition Theory Network Workshop, Aix-en-Provence France, May 2019
 - 2019 Conference on Economic Design, Corvinus University of Budapest, Hungary, June 2019
 - 2019 International Conference on Public Economic Theory (PET 2019), Université de Strasbourg, France, July 2019

Cyrille Dossougoin

- *Sovereign risk spillovers through (endogenous) cross-border financial linkages*
 - 43rd Simposio de la Asociación Española de Economía-Spanish Economic Association (SAEe), Universidad Carlos III de Madrid, Spain, December 2018
 - ADRES Doctoral Conference, Aix-Marseille School of Economics, Marseille, France, December 2018

Jacques Drèze

- *The macroeconomic theory of incomplete markets*
 - Summer Workshop in Economic Theory (SWET 2019) in Memory of Martine Quinzii, Paris, France, June 2019
- *Public policies under incomplete markets*
 - 2019 International Conference on Public Economic Theory (PET 2019), Université de Strasbourg, France, July 2019

Olivier Finance

- *Circulation de camions en Belgique. Les big-data au service de la connaissance du territoire*
 - Rencontres de Théo Quant - Nouvelles Approches en Géographie Théorique et Quantitative, Besançon, France, February 2019

Sylvain Funck

- *Matching with couples with farsighted agents*
 - 2019 Conference on Economic Design, Corvinus University of Budapest, Hungary, June 2019

Céline Gérard

- *A comparison of priority service versus real-time pricing for enabling residential demand response*
 - 30th European Conference on Operational Research, Dublin, Ireland, June 2019
 - IEEE Power & Energy Society General Meeting, Atlanta, USA, August 2019

François Glineur

- *Performance estimation of first-order methods*
 - University of Coimbra, Portugal, October 2018
- *On the worst-case of the fixed-step gradient method for arbitrary stepsizes*
 - 6th International Conference on Continuous Optimization (ICCOPT 2019), Technische Universität Berlin, Germany, August 2019

Andras Gregor

- *The effects of electoral formula on public finances - Evidence from Hungarian municipalities*
 - 43rd Simposio de la Asociación Española de Economía-Spanish Economic Association (SAEe), Universidad Carlos III de Madrid, Spain, December 2018

Madeleine Guyot

- *Une typologie du paysage urbain bruxellois dans un perspective de recherche en santé*
 - Rencontres de Théo Quant - Nouvelles Approches en Géographie Théorique et Quantitative, Besançon, France, February 2019

Thuc Huan Ha

- *Servitization as a sustainable business model, an economic analysis*
 - 12th Belgian Environmental Economics Day, Universiteit Antwerpen, Belgium, February 2019
- *Peer-to-peer rental vs. secondhand market: Implications on the manufacturing firm of durable goods*
 - 26th Ulvön Conference on Environmental Economics, Sweden, June 2019
- *Is servitization as a sustainable business model? A focus on pay-per-use pricing structure*
 - 2019 International Conference on Public Economic Theory (PET 2019), Université de Strasbourg, France, July 2019

Thomas Hacardiaux

- *Reducing COE emissions using horizontal cooperation*
 - 33rd Annual Conference of the Belgian Operational Research Society (ORBEL 33), Hasselt, Belgium, February 2019
- *Assessing the environmental benefits of horizontal cooperation*
 - 25th Euro Working Group on Locational Analysis Meeting (EWGLA 2019), Vrije Universiteit Brussels, Belgium, June 2019
- *Multi-objective optimization framework for the integration of individual partner interests in a collaborative location-inventory model*
 - 7th TSL Workshop «Transportation in the Sharing Economy», Vienna, Austria, July 2019

Christian Hafner

- *Alternative assets and cryptocurrencies*
 - Haindorf Seminar 2019, Hejnice, Czech Republic, January 2019
- *Testing for bubbles in cryptocurrencies with time-varying volatility*
 - University of Nottingham, United Kingdom, March 2019
- *Score-driven models for financial bubbles and volatility*
 - Conference on Score-driven and Nonlinear Time Series Models, Cambridge, United Kingdom, March 2019

Jean-Jacques Herings

- *Berekende evenwichten*
 - VAET-dag, Tilburg, The Netherlands, September 2018
- *Equilibrium and matching under price controls*
 - Seminar Quantitative Social and Management Sciences Research Centre, Budapest, Hungary, September 2018
 - Seminar Advances in Computational Economics and Finance, Zürich, Switzerland, November 2018
 - Barcelona JOCS: Seminar on Game Theory and its Applications, Barcelona Graduate School of Economics, Spain, January 2019
- *The myopic stable set for social environments*
 - 13th Workshop on Economic Design and Institutions, Brussels, Belgium, December 2018
 - Edinburgh, United Kingdom, April 2019
 - Summer Workshop in Economic Theory (SWET 2019) in Memory of Martine Quinzii, Paris, France, June 2019
 - 19th Annual SAET Conference, Ischia, Italy, June 2019
 - Econometric Society European Meeting, Manchester, United Kingdom, August 2019
- *The last will be first, and the first last: Segregation in societies with positional externalities*
 - London, United Kingdom, March 2019
- *Matching with myopic farsighted players*
 - Match-up 2019, 5th International Workshop on Matching under Preferences, Congressi Stefano Franscini, Monte Verità, Ascona, Switzerland, May 2019

Manuel Herrera Rodriguez

- *Liner ship fleet deployment models and the cost of time: The case of the China-USA maritime routes*
 - 1st Conference of the Yangtze-River Research and Innovation Belt (Y-RIB), Zhejiang University, Zhoushan, China, December 2018

Jean Hindriks

- *Ecole du renouveau*
 - Itinera House, Brussels, Belgium, September 2018
- *Formation en alternance*
 - Symposium sur la Formation en Alternance, Palais Royal, Brussels, Belgium, February 2019
- *Réforme des pensions*
 - Congrès de la Fonction Publique, Namur, Belgium, March 2019
 - AG Insurance, Brussels, Belgium, April 2019
- *Un projet pour la Belgique*
 - Sénat, Brussels, April 2019
- *Futur de la sécurité sociale*
 - SPF Sécurité Sociale, Tour des Finances, Brussels, Belgium, April 2019
- *Pension reform in Belgium*
 - AXA Topic Days, Cercle du Lac, Louvain-la-Neuve, Belgium, May 2019
- *Heterogeneous tax pass-through: Evidence from Belgium*
 - Université du Luxembourg, Luxembourg, May 2019
 - 19^{èmes} Journées Louis-André Gérard-Varet, Aix-en-Provence, France, June 2019
- *La gestion publique de Brussels*
 - Itinera House, Brussels, Belgium, July 2019

Johannes Johnen

- *Dynamic competition in deceptive markets*
 - Universität zu Köln (Economics Seminar), Germany, Summer 2018
- *Automatic-renewal contracts with heterogeneous consumers inertia*
 - Center for Research in Economics (CEREC), Université Saint-Louis, Brussels, Belgium, Spring 2019
- *Browsing versus studying: A pro-market case for regulation*
 - University of Oxford, United Kingdom, June 2019
 - 45th Annual Conference of the European Association for Research in Industrial Economics (EARIE), Athens, Greece, August 2019

Nathan Lassance

- *Optimal portfolio diversification via independent component analysis*
 - 2018 INFORMS Annual Meeting, Phoenix, USA, November 2018
 - Actuarial and Financial Mathematics Conference, Brussels, Belgium, February 2019

Marie-Louise Leroux

- *Fair ong-term care insurance*
 - Conférence CREPP/CDER, Université Laval, Canada, January 2019
 - 20th European Health Economics Workshop, Verona, Italy, May 2019

Quentin Lété

- *Impact of topology control on zonal electricity market operations*
 - 30th European Conference on Operational Research, University College Dublin, Ireland, June 2019

Sabina Luncasu

- *School of effectiveness under measurement error*
 - LIES, Pontificia Universidad Catolica de Chile, Saintiago, Chile, August 2019

Leonardo Madio

- *Network formation with myopic and farsighted players*
 - 10th UECE Game Theory Lisbon Meetings, Lisbon, Portugal, October 2018
 - 13th BIGSEM Doctoral Workshop on Economic Theory, Bielefeld, Germany, December 2018
 - 2019 Conference on Economic Design, Corvinus University of Budapest, Hungary, June 2019

Ana Mauleon

- *Matching with myopic and farsighted players*
 - 15th Matching in Practice Workshop, Center for European Economic Research (ZEW), Mannheim, Germany, October 2018
 - Annual Meeting of the Association of Southern-European Economic Theorists (ASSET 2018), Università degli Studi Firenze, Firenze, Italy, November 2018
 - Institutional Design and Economic Preferences: Theory and Experiments, INDEPTH 1st Workshop, GATE Lyon Saint-Etienne, France, March 2019
 - 2019 Conference on Economic Design, Corvinus University of Budapest, Hungary, June 2019
 - 72nd European Meeting of the Econometric Society, University of Manchester, United Kingdom, August 2019
- *R&D network formation with myopic and farsighted firms*
 - Universidad Complutense de Madrid, Spain, March 2019

Ilyes Mezghani

- *A mixed integer second order cone program for transmission-distribution system co-optimization*
 - IEEE PES PowerTech Milano, Politecnico Milano, Italy, June 2019

Mariam Nanumyan

- *Efficient gains of social influence in a minimum effort game*
 - GENED German Network for New Economic Dynamics, Universität zu Kiel, Germany, October 2018
 - UECE Lisbon Meetings 2019: Game Theory and Applications, ISEG, Universidade de Lisboa, Portugal, October 2018
- *Union formation in network spill-over games*
 - CEREC Workshop in Economics, Université Saint-Louis, Brussels, Belgium, May 2019
 - 15th European Meeting on Game Theory (SING 15), University of Turku, Finland, July 2019

Yurii Nesterov

- *High-order methods in optimization*
 - 9th International Conference «Optimization and Applications (OPTIMA-2018), Petrovac, Montenegro, October 2018

Anthony Papavasiliou

- *Scarcity pricing market design considerations*
 - NFORMS Annual Meeting, Phoenix, USA, November 2018

- *A bi-level optimization formulation of priority service pricing*
 - INFORMS Annual Meeting, Phoenix, USA, November 2018
- *Solving large-scale unit commitment with asynchronous parallel decomposition*
 - INFORMS Annual Meeting, Phoenix, USA, November 2018
- *Transmission capacity allocation in zonal electricity markets*
 - Energy Systems and Optimization Workshop, Atlanta, USA, November 2018
 - Workshop on Flexible Operation and Advanced Control for Energy Systems, Cambridge University, England, January 2019
 - Market Design 2030 Expert Workshop, ENTSO-E, Brussels, Belgium, February 2019
- *Optimization of trading strategies in continuous intraday markets*
 - Workshop on Bidding and Scheduling Flexible Power Resources in Short Term Markets, SINTEF, Trondheim, Norway, January 2019
- *A random walk Down Hearst Avenue*
 - Energy and Market Engineering Symposium in Honor of Shmuel Oren, University of California, Berkeley, USA, February 2019
- *Nodal and zonal market clearing*
 - 14th EU-US Regulators' Round Table, Council of European Energy Regulators, Brussels, Belgium, March 2019
- *Market design considerations for scarcity pricing: A stochastic equilibrium framework*
 - NTNU PhD Winter School in Energy Systems and Markets, Kvitfjell, Norway, March 2019
 - Workshop on Electricity Systems of the Future, Cambridge University, United Kingdom, March 2019
- *An asynchronous distributed algorithm for solving stochastic unit commitment*
 - Workshop on Planning Low-Carbon Electricity Systems, Cambridge University, United Kingdom, April 2019
- *Market design proposal for the implementation of scarcity pricing in Belgium*
 - National Technical University of Athens, Greece, June 2019
- *Market reforms for stressed conditions: The case of Europe*
 - 95th Session of the Harvard Electricity Policy Group, Harvard University, Boston, USA, June 2019
- *Impact of transmission switching on zonal markets*
 - Danish Technical University, Lyngby, Denmark, May 2019
 - Université de Lucerne, Switzerland, July 2019

Wenli Peng

- *Joint purchasing agreements in technology markets: tradeoffs in information sharing*
 - INFORMS Annual Meeting, Phoenix, USA, November 2018

Pierre Pestieau

- *LTC and behavior of insurance purchasing. Some thoughts on the LTC insurance puzzle*
 - 2018 Global Ageing Conference, Paris, France, October 2018
- *Some thoughts on the LTC insurance puzzle*
 - SCOR-IDEI Workshop on Long Term Care and Longevity, Paris, France, October 2018
- *Premature death, accidental bequests and fairness*
 - Vilniaus universitetas, Lithuania, March 2019
- *Insurance with a deductible. A way out of the long term care insurance puzzle*
 - CESifo PSE Workshop, Munich, Germany, March 2019
 - 2019 International Conference on Public Economic Theory (PET 2019), Université de Strasbourg, France, July 2019
- *Missing poor in the U.S.*
 - ECINEQ Annual Meeting, Paris, France, July 2019
- *Fair long-term care insurance*
 - IPF Annual Congress, Glasgow, United Kingdom, August 2019

Pierre Picard

- *Vertical differentiation and trade*
 - European Trade Study Group, Warsaw, Poland, September 2018
- *Spatial structures with forward and backward linkages*
 - Conference in Honor of Professor Sneessens, Luxembourg, November 2018
- *Green urban areas*
 - 1st BURENet Scientific Workshop, Vrije Universiteit Brussels, Belgium, December 2018

Erika Pini

- *Economic inequality, political polarization and voter turnout*
 - Prague Conference on Political Economy 2019, CEVRO Institute, Warsaw, April 2019
 - Warwick Economics PhD Conference, University of Warwick, United Kingdom, June 2019
 - 10th Workshop on Institutions, Individual Behavior and Economic Outcomes, Alghero Sardinia, June 2019
 - 2019 International Conference on Public Economic Theory (PET 2019), Université de Strasbourg, France, July 2019
 - 72nd European Meeting of the Econometric Society (EEA-ESEM), Manchester, United Kingdom, August 2019

José Miguel Quesada Pérez

- *A comparison between the fixed and flexible hub assignment approaches when solving the express shipment service network design problem*
 - International Conference on Operations Research 2018, Brussels, Belgium, September 2018
- *Comparing the fixed and flexible hub assignment approaches when solving the express shipment service network design problem*
 - INFORMS Annual Meeting, Phoenix, USA, November 2018

Anton Rodomanov

- *Greedy quasi-Newton method with explicit superlinear convergence*
 - 17th Workshop on Advances in Continuous Optimization (EUROPT 2019), Glasgow, United Kingdom, June 2019

Jose Sempere-Moneris

- *Alternative airport privatization regimes in hub-and-spoke networks*
 - XXXIII Jornadas de Economía Industrial, Universidad de Barcelona, Spain, September 2018
- *Relative R&D intensity and for exporters in an oligolistic industry with spillovers*
 - 9th Conference Economics of Global Interaction, Università degli Studi di Bari Aldo Moro, Italy, September 2018

Valerio Serse

- *The heterogeneous impact of sugar taxes on Cola demand across different household types*
 - 29th EC² on Big Data Econometrics with Applications, Bank of Italy, Roma, Italy, December 2018
 - 7th PhD-Student Workshop on Industrial and Public Economics (WIPE), CREIP, Universitat Rovira i Virgili, Reus, Spain, February 2019
 - 12th RGS Doctoral Conference in Economics, Ruhr-Universität Bochum, Germany, February 2019
 - PhD Seminar at Aix-Marseille School of Economics, France, March 2019
 - 2019 International Conference on Public Economic Theory (PET 2019), Université de Strasbourg, France, July 2019

Yves Smeers

- *Risk premium and stochastic equilibrium models (generation capacity expansion)*
 - Workshop «Energy Systems of the Future: Incentive, Regulation and Analysis for Efficient Investment», University of Cambridge, United Kingdom, March 2019

Jacques-François Thisse

- *About the origin of cities*
 - 2018 SMU Conference on Urban and Regional Economics, Singapore Management University, Singapore, December 2018
 - 20th April International Academic Conference on Economic and Social Development, National Research University Higher School of Economics, Moscow, Russia, April 2019.

Isabelle Thomas

- *Do ICT data reveal a new geography of Belgium ?*
 - Journée d'Etude à la Fondation Universitaire on «Mobility and Urban Development: All Powers to the regions»? Brussels, Belgium, December 2018
- *Déterminants et enjeux spatiaux des déplacements domicile-travail*
 - HR Square, Brussels, Belgium, February 2019

- *Mapping medication reimbursement: socioeconomic environment on public healthiness in Belgium*
 - ASRDLF (Association de Science Régionale de Langue Française) 2019, Iasi, Romania, July 2019
 - 59th ERSA Congress «Cities, Regions and Digital Transformations: Opportunities, Risks and Challenges», Lyon, France, August 2019

Lorenzo Tondi

- *Music production without copyright protection*
 - 7th International PhD Meeting in Economics, University of Macedonia, Thessaloniki, Greece, July 2019

Sonia Trabelsi

- *Using medication reimbursement data as proxy for health: Some spatial issues*
 - Rencontres de Théo Quant - Nouvelles Approches en Géographie Théorique et Quantitative, Besançon, France, February 2019

Vincent Vannetelbosch

- *Absorbing sets in network formation with myopic and farsighted players*
 - UECE Lisbon Meetings 2018: Game Theory and Applications, Technical University of Lisbon, Portugal, October 2018
- *Network formation with myopic and farsighted players*
 - ASSET 2018 Annual Meeting, Università degli Studi di Firenze, Italy, November 2018
 - CEREC Workshop in Economics, Université Saint-Louis, Brussels, Belgium, November 2018
 - 24th Coalition Theory Network (CTN) Conference, Aix-Marseille School of Economics, Aix-en-Provence, France, May 2019

Frédéric Vrins

- *Fitting default intensity models to market curves: A time change approach*
 - Quantitative Finance and Risk Analysis (QFAR), Kos, Greece, June 2019

Laurence Wolsey

- *Introduction to MIP*
 - North Eastern University, Shenyang, China, March 2019
- *Column generation and branch(-cut)-and-price*
 - North Eastern University, Shenyang, China, March 2019
- *Benders' decomposition and extended formulation*
 - North Eastern University, Shenyang, China, March 2019
- *Lot-sizing/production planning models and MIP*
 - North Eastern University, Shenyang, China, March 2019
- *Some routing and inventory routing models*
 - North Eastern University, Shenyang, China, March 2019
- *«Facet» separation with one linear program*
 - North Eastern University, Shenyang, China, March 2019
- *On Bender's decomposition*
 - Meeting «Complexity and Combinatorial Optimization» 85th Anniversary of Jack Edmons, Université Paris 1 Panthéon-Sorbonne, France, May 2019

5

- › [MANAGEMENT](#)
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PEOPLE

PEOPLE

Management



Philippe CHEVALIER

President



Isabelle THOMAS

Research Director



Nancy Guillaume

Executive Director

Faculty



Per Agrell

- **Current positions:** Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus), Belgium; Dean of the Faculty, Louvain School of Management (UCLouvain).
- **Fields of interest:** **Supply chain management, energy economics, operations research.**
- **Education:** Ph.D. in Production Economics, Linköping University, Sweden, 1995, MSc in I.E.O.R, University of Massachusetts, USA, 1991.
- **Former positions over the last five years:** Adjunct Professor, Norwegian School of Economics, Department of Management Science, 2012-2017.
- **Current editorial activities:** Board Member, *International Journal of Production Economics* and *Business Research*.



Paul Belleflamme

- **Current positions:** Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus), Belgium; Research Affiliate, Center for Economic Studies and Ifo Institute for Economic Research.
- **Fields of interest:** **Microeconomics, industrial organization, and innovation.**
- **Education:** Docteur en sciences économiques, UNamur, Belgium, 1997.
- **Former positions over the last five years:** Co-director, CORE, UCLouvain, Belgium, 2014-2016, Professor Aix-Marseille Université (2017-2018); Visiting Professor, Kedge Business School (2017-2018), Imperial College School of Business London (2017 - present) and Aix-Marseille School of Economics (2018 - present).
- **Prizes & Awards:** Prix du Fonds International WERNAERS for scientific research and knowledge diffusion, 2012; Francqui Chair, Université de Liège, 2013; Louvain School of Management Research Award 2014; Louvain School of Management Best Education Award, 2014.
- **Current editorial activities:** Co-editor, *E-conomics*, Associate Editor: *Journal of Economics* and *Regards Economiques*.



Thierry Bréchet

- **Current position:** Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus), Belgium.
- **Fields of interest:** **Environmental economics.**
- **Education:** Docteur en sciences économiques, Université Paris 1 Panthéon-Sorbonne, France, 2000.
- **Former positions over the last five years:** Visiting Professor, European University of St Petersburg, Russia, 2009-2015.



Daniele Catanzaro

- **Current position:** Assistant Professor, UCLouvain (Louvain School of Management, Mons & Louvain-la-Neuve campus); visiting professor, LISER, Luxembourg.
- **Fields of interest:** **Discrete optimization, mixed integer programming, computational complexity, combinatorial and graph-theoretic algorithms, medical bioinformatics.**
- **Education:** Docteur en sciences informatiques (Operations Research), Université libre de Bruxelles, 2008.
- **Former positions over the last five years:** Assistant Professor at Universiteit Groningen, the Netherlands, 2013-2014.
- **Prizes & Awards:** Prize Fonds Brachet funded by the Institute of Medicine and Molecular Biology (IBMM) of the Université libre de Bruxelles, Belgium, 2007; U.S. National Institutes of Health awards 1R01CA140214 and 1R01AI076318; Belgian American Educational Foundation (BAEF) Honorary Fellowship 2010-2011 for biomedical engineering research in the USA; Elsevier Recognized Reviewer Award, 2018.



Philippe Chevalier

- **Current positions:** Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus), Belgium; President, CORE (UCLouvain); President, IMMAQ (UCLouvain); President, jury bachelier ingénieur de gestion (UCLouvain).
- **Fields of interest:** **Operations research, supply chain management, operations management, stochastic models.**
- **Education:** Ph.D. in Operations Research, Massachusetts Institute of Technology, Cambridge (MA), USA, 1992.
- **Current editorial activities:** Associate Editor, *Management Science*.



Julio Dávila

- **Current positions:** Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium; Directeur de Recherches CNRS, Paris, France (on leave).
- **Fields of interest:** **Economic theory, macroeconomics, growth theory, public economics**
- **Education:** Docteur en sciences économiques, Ecole des Hautes Etudes en Sciences Sociales, Paris, France, 1994.
- **Former positions over the last five years:** President, Ecole d'Economie de Louvain (UCLouvain); Fernand Braudel Fellow, European University Institute, Italy, 2016; Co-director, CORE, UCLouvain, Belgium, 2012-2014.
- **Current editorial activities:** Associate Editor, *Economics Bulletin*.



Zhengyuan Gao

- **Current position:** Assistant Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium.
- **Fields of interest:** **Econometrics and economic theory**
- **Education:** Ph.D. in Econometrics, Universiteit Amsterdam, The Netherlands, 2012.
- **Former positions over the last five years:** Visiting Assistant Professor at University of Iowa, USA, 2012-2014; Associate Professor at Southwestern University of Finance and Economics, China, 2012-2014.



François Glineur

- **Current positions:** Professor, UCLouvain (Ecole Polytechnique de Louvain, INMA), Belgium; Member of the Institute of Technologies, Electronics and Applied Mathematics (ICTEAM, UCLouvain); Vice-dean: Ecole Polytechnique de Louvain.
- **Fields of interest:** **Optimization: algorithms, modelling and applications, nonnegative matrix factorization**
- **Education:** Docteur en sciences appliquées, Faculté polytechnique de Mons (Université de Mons), Belgium, 2001.



Christian Hafner

- **Current positions:** Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium; Member of the Institut de Statistique, Biostatistique et Sciences Actuarielles (UCLouvain).
- **Fields of interest:** **Time series and financial econometrics**
- **Education:** Ph.D. in Economics, Humboldt-Universität zu Berlin, Germany, 1996.
- **Former position over the last five years:** President, Louvain School of Statistics, Biostatistics and Actuarial Science, UCLouvain, Belgium, 2010-2015.
- **Current editorial activities:** Associate Editor, *Econometrics*, *Journal of Business and Economic Statistics*, *Journal of Risk and Financial Management*, and *Studies in Nonlinear Dynamics and Econometrics*.
- **Prizes & Awards:** Distinguished Fellow, International Engineering and Technology Institute, 2018; Multa Scripsit, Econometric Theory Award, 2018.



Jean Hindriks

- **Current positions:** Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium; Senior Fellow, Itinera Institute, Bruxelles, Belgium; Membre du Conseil Académique des Pensions, Belgium.
- **Fields of interest:** **Public economics, health, education and welfare**
- **Education:** Docteur en sciences économiques, UNamur, Belgium, 1996.
- **Current Editorial Activities:** Associate Editor, *Journal of Public Economic Theory*.



Leonardo Iania

- **Current positions:** Assistant Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus); President of LFIN (UCLouvain); Research Affiliate, National Bank of Belgium, Bruxelles, Belgium; Visiting Professor, KU Leuven, Belgium.
- **Fields of interest:** **Financial markets, money and interest rates, monetary policy, central banking, and the supply of money and credit**
- **Education:** Ph.D in Econometrics, KU Leuven, Belgium, 2012.
- **Former position over the last five years:** Post-doctoral position, Universiteit Maastricht, The Netherlands, 2015-2016.



Johannes Johnen

- **Current position:** Assistant Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium.
- **Fields of interest:** **Behavioral economics, industrial organization, microeconomic theory.**
- **Education:** Ph.D. in Economics, European School of Management and Technology, Berlin, Germany, 2016.
- **Prizes & Awards:** Young Economists' Essay Award (YEEA) at the EARIE Conference in Athens 2018.



Bart Jourquin

- **Current positions:** Professor, UCLouvain (Louvain School of Management, Mons campus), Belgium; President, Conseil de Faculté, Louvain School of Management (UCLouvain).
- **Fields of interest:** **Operations Research, transport economics, transport modelling.**
- **Education:** Ph.D. in Applied Economics, Facultés Universitaires Catholiques de Mons, Belgium, 1995.



François Maniquet

- **Current position:** Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium; visiting professor, LISER, Luxembourg.
- **Fields of interest:** **Poverty, public economics and welfare economics.**
- **Education:** Docteur en sciences économiques, UNamur, Belgium, 1994.
- **Former positions over the last five years:** Part-time Professor, University of Warwick, United Kingdom, 2008-2014; Research Director, CORE, UCLouvain, Belgium, 2011-2014.
- **Prizes & Awards:** SCW Prize, 2004, best paper in Review of Economic Design, 2004; Chercheur qualifié honoraire, Fonds National de la Recherche Scientifique (FNRS), Belgium; Francqui Chair 2009-2010, Université Saint-Louis, Bruxelles, Belgium; Francqui Prize, 2010; ERC grant laureate 2010.
- **Current editorial activities:** Associate Editor, *Social Choice and Welfare*.



Ana Mauleon

- **Current positions:** Research Director, Fonds National de la Recherche Scientifique (FNRS), Belgium; Associate Professor, Université Saint-Louis (Faculté des sciences économiques, sociales et politiques), Bruxelles, Belgium; Director of the Center for Research in Economics (CEREC), Université Saint-Louis, Bruxelles, Belgium.
- **Fields of interest:** **Game theory, bargaining theory and matching theory, group formation, industrial organization, network theory.**
- **Education:** Ph.D. in Economics, Universidad del País Vasco, Bilbao, Spain, 1997.
- **Former positions over the last five years:** Co-director of the Center for Research in Economics (CEREC), 2008–2015, Université Saint-Louis, Bruxelles, Belgium.
- **Current editorial activities:** Associate Editor, *Mathematical Social Sciences*.



Yurii Nesterov

- **Current positions:** Professor, UCLouvain (Ecole Polytechnique de Louvain, INMA), Belgium; Member of the Institute of Technologies, Electronics and Applied Mathematics, Mathematical engineering division (UCLouvain).
- **Fields of interest:** **Optimization and operations research.**
- **Education:** Ph.D. in Applied Mathematics, Institute of Control Sciences, Moscow, Russia, 1984.
- **Prizes & Awards:** Dantzig Prize, 2000; John Von Neumann Theory Prize, 2009; Best Paper Award, Optimization Methods and Software, 2010; EUROPT fellow, 2010; Francqui Chair 2012, Université de Liège, Belgium; Honorable Simon Stevin Lecture on Optimization in Engineering, KU Leuven, Belgium, 2013; SIAM Outstanding paper award, 2014; EURO Gold Medal, 2016; ERC advanced grant from European Research Council, 2018.
- **Current editorial activities:** Associate Editor, *Journal of Optimization Theory and Applications and Optimization Methods and Software*.



Anthony Papavasiliou

- **Current position:** Associate Professor, UCLouvain (Ecole Polytechnique de Louvain, INMA), Belgium.
- **Fields of interest:** **Optimization techniques, computational techniques, energy markets.**
- **Education:** Ph.D. in Industrial Engineering and Operations Research, University of California at Berkeley, USA, 2011.
- **Former positions over the last five years:** Postdoctoral Researcher: University of California at Berkeley, USA, 2011–2012; Consulting: ACER/CEER, ENTSO-E, Belgian regulatory commission of electricity and gas, N-SIDE, Pacific Gas and Electric, Quantil, Sun Run, Holder of the Engie Faculty Chair in Quantitative and Energy Economics, 2013–2015.
- **Prizes & Awards:** Best publication in Energy, INFORMS, 2015; Bauchau Prize, 2017; Francqui research professor, 2018–2021; starting grant ERC 2019 from European Research Council.
- **Current editorial activities:** Associate Editor, *IEEE Transactions on Power Systems and Operations Research*.



Jean-Sébastien Tancrez

- **Current position:** Assistant Professor, UCLouvain (Louvain School of Management, Mons Campus), Belgium.
- **Fields of interest:** **Supply chain management, operations research, supply chain network design, stochastic modelling**
- **Education:** Docteur en sciences de l'ingénieur, UCLouvain, Belgium, 2009.



Isabelle Thomas

- **Current positions:** Research Director, Fonds de la Recherche Scientifique (FRS-FNRS), Belgium, and Professor, UCLouvain (Faculté des sciences, Ecole de géographie), Belgium; Research Director of CORE, UCLouvain, Belgium.
- **Fields of interest:** **Quantitative and economic geography.**
- **Education:** Docteur en sciences géographiques, UCLouvain, Belgium, 1984; agrégée de l'enseignement supérieur, UCLouvain, Belgium, 2000.
- **Prizes & Awards:** Prix Aydalot in Regional Science, 1989; BMW Scientific Award, 2001; Prix de la Compagnie du Bois Sauvage 2011–2012; Francqui Chair 2015, Universiteit Antwerpen; Distinguished speaker, Transport Lecture Series 2015, The University of Hong Kong, 2015; Edward L. Ullman Award 2017; RSAI Fellow in 2019; Member of Academia Europaea.
- **Current editorial activities:** Editorial Board Member, *L'Espace Géographique, Journal of Geographical Systems and Revue de la Société Belge de Géographie/e-Belgeo*.



Sébastien Van Bellegem

- **Current positions:** Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium; Dean, Faculté des sciences économiques, sociales, politiques et de communication, UCLouvain.
- **Fields of interest:** **Econometric theory, mathematical statistics.**
- **Education:** Docteur en sciences statistiques, UCLouvain, Belgium, 2003; HDR en économétrie, Université de Toulouse 1, France, 2008.
- **Previous positions in the last five years:** Professeur des universités, Toulouse School of Economics, Université de Toulouse 1, 2008–2012; Universidad EAFIT, Medellín, 2016–2017.
- **Prizes & Awards:** Prix Marie-Jeanne Laurent-Duhamel, 2005.
- **Current editorial activities:** Associate Editor, *Journal de la Société Française de Statistique*, *International Econometrics Review*.



Vincent Vannetelbosch

- **Current positions:** Senior Research Associate, Fonds de la Recherche Scientifique (FNRS), Belgium; Professor, UCLouvain (Faculté des sciences économiques, sociales, politiques et de communication, Ecole des sciences économiques), Belgium; Associate Fellow of CEREC, Université Saint-Louis, Bruxelles, Belgium; Director of the European Doctoral Program in Quantitative Economics; Affiliated member of the Swiss Center for Data and Network Sciences, Universität Freiburg.
- **Fields of interest:** **Game theory, bargaining and matching theory, group formation and network theory, and industrial organization.**
- **Education:** Docteur en sciences économiques, UCLouvain, Belgium (European Doctoral Program in Quantitative Economics), 1996.
- **Current editorial activities:** Associate Editor, *Social Choice and Welfare*



Mathieu Van Vyve

- **Current position:** Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus), Belgium.
- **Fields of interest:** **Discrete optimization, computational economics, operations research.**
- **Education:** Docteur en sciences appliquées, UCLouvain, Belgium, 2003; Master in Philosophy, UCLouvain, Belgium, 1999.



Frédéric Vrins

- **Current position:** Professor, UCLouvain (Louvain School of Management, Louvain-la-Neuve campus), Belgium.
- **Fields of interest:** **Stochastic processes and mathematical finance.**
- **Education:** Docteur en sciences appliquées, UCLouvain, Belgium, 2007.
- **Current editorial activities:** Member of the Editorial Committee, *Regards Economiques*

Emeriti



Luc Bauwens

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Econometrics, statistics.**
- **Education:** Docteur en sciences économiques, UCLouvain, Belgium, 1983.
- **Prizes & Awards:** Leonard J. Savage Thesis Award, 1984; Francqui Chair, UNamur, Belgium, 2005–2006; Fellow of the Society for Financial Econometrics.



Claude d'Aspremont

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Mathematical economics, social choice theory, mechanism design and game theory, and industrial organization.**
- **Education:** Ph.D. in Decision Sciences, Graduate School of Business, Stanford University (CA), USA, 1973.
- **Prizes & Awards:** Fellow of the Econometric Society, 1984; Francqui Prize, 1995; Doctor *Honoris Causa*, Université Louis Pasteur, Strasbourg, France, 2002; Founding Fellow of the Society for the Advancement of Economic Theory (SAET), 2011; President-elect of the Society for Social Choice and Welfare, 2016–2018.

- **Current editorial activities:** Associate Editor, *Journal of Public Economic Theory* and *Social Choice and Welfare*.



Pierre Dehez

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Game theory and general equilibrium theory.**
- **Education:** Docteur en sciences économiques, UCLouvain (European Doctoral Program in Quantitative Economics), 1980.
- **Previous positions in the last five years:** Visiting Professor at University of Nancy, France and University of Pisa, Italy



Jacques Drèze

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Economic theory and macroeconomics.**
- **Education:** Ph.D. in Economics, Columbia University, New York (NY), USA, 1958.
- **Prizes & Awards:** Fellow, 1964 and President, 1970 of the Econometric Society; Francqui Chair, Université libre de Bruxelles, Belgium, 1970–1971 and KU Leuven, Belgium, 1982–1983; Andrew D. White Professor-at-Large, Cornell University, Ithaca (NY), USA, 1971–1977; President of the European Economic Association, 1985–1986; President of the International Economic Association, 1996–1999; Doctor *Honoris Causa*, 19 universities.



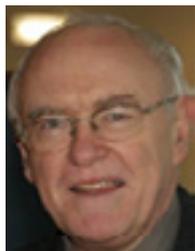
Jean J. Gabszewicz

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Microeconomics.**
- **Education:** Docteur en droit, UCLouvain, Belgium, 1961; Docteur en sciences économiques, UCLouvain, Belgium, 1968.
- **Former position over the last five years:** Visiting Professor, Università Sapienza di Roma, Italy, 2016.
- **Prizes & Awards:** Fellow of the Econometric Society, 1979; administrator of CEPREMAP, Paris, France; member of the Council of the European Economic Association, 1986–1989; Doctor *Honoris Causa*, Université d'Aix-Marseille II, France, 2003; Fellow of the European Economic Association, 2004.



Victor Ginsburgh

- **Current position:** Professor Emeritus, Université libre de Bruxelles, Belgium.
- **Fields of interest:** **Microeconomics, economics and languages, economics of the arts.**
- **Education:** Docteur en sciences économiques, Université libre de Bruxelles, Belgium, 1972.
- **Prizes & Awards:** Francqui Chair, Université de Liège, Belgium, 1992–1993; President of the International Association of Cultural Economics, 2002–2004.
- **Current editorial activities:** Co-editor, *Journal of Wine Economics*.



Etienne Loute

- **Current position:** Professor Emeritus, Université Saint-Louis, Bruxelles, Belgium.
- **Fields of interest:** **programming: algorithmic and implementation issues, management and engineering applications of mathematical programming.**
- **Education:** Docteur en sciences appliquées, UCLouvain, Belgium, 1976.



Michel Mouchart

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Statistics, econometrics.**
- **Education:** Docteur en sciences économiques, UCLouvain, Belgium, 1973.
- **Prizes & Awards:** Elected Member of the International Statistical Institute; Elected Fellow of the International Society for Bayesian Analysis, Bernoulli Society, Société Belge de Statistique.
- **Current editorial activities:** Associate Editor, *Statistica* and *International Econometric Review*.



Dominique Peeters

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** Location theory, economic geography, regional science, mathematical programming, operations research.
- **Education:** Docteur en sciences appliquées, UCLouvain, Belgium, 1980; agrégé de l'enseignement supérieur, UCLouvain, Belgium, 1995.



Pierre Pestieau

- **Current positions:** Professor Emeritus, Université de Liège, Belgium; Associate member, Paris School of Economics, France; CESifo; and IZA Research Fellow.
- **Fields of interest:** Public economics and population economics.
- **Education:** Ph.D. in Economics, Yale University, New Haven (CT), USA, 1971.
- **Prizes & Awards:** Francqui Prize, 1989; AGF ASSUBEL Prize, 1995; Einaudi Chair in European Studies, Cornell University, Ithaca (NY), 1997; Prix Risque-Les Echos, 2006 and 2018; Honorary Degree Uppsala University, 2011 and Université de Neuchâtel, Switzerland, 2016.
- **Current editorial activities:** Associate-editor, *CESifo Economic Review*, *Journal of Pensions*, *Journal of Public Economic Theory* and *Revue Française d'Économie*.



Léopold Simar

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** Mathematical statistics, nonparametric statistics, bootstrap, frontier estimation, production analysis.
- **Education:** Docteur en sciences appliquées (mathématiques appliquées), UCLouvain, Belgium, 1974.
- **Former positions over the last five years:** Visiting Professor, Institut Français du Pétrole, Rueil, France, 1991–2013; University of Salento, Lecce, Italy, 2010–2018; University of Queensland, Brisbane, Australia, 2011–2016; Università degli Studi di Roma "La Sapienza", Italy, 2011–2018; Toulouse School of Economics, France, 2010–2018.
- **Prizes & Awards:** Chaire d'Excellence Pierre de Fermat, 2008–2009, Region Midi-Pyrénées, Toulouse School of Economics, France, 2013–2014 Messageri della Conoscenza, Italian Ministry of Research, University of Salento, Lecce, Italy; Elected Member of the International Statistical Institute; President of the Belgian Statistical Society, 1999–2002; Honorary Member of the Belgian Statistical Society; Fellow of the *Journal of Econometrics*, 2015; Econometric Theory, Multa Scripsit Award, 2016.
- **Current editorial activities:** Associate-editor, *Journal of Productivity Analysis*.



Yves Smeers

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** Computational economics and risk management in the electricity and gas industries.
- **Education:** Ingénieur Physicien, Université de Liège, 1967, Master of Science (industrial administration), 1971; Ph.D. in Operations Research, Carnegie-Mellon University, Pittsburgh (PA), USA, 1972; Licencié en sciences économiques, UCLouvain, Belgium, 1973.
- **Former positions over the last five years:** Visiting Research Fellow, KAPSAR, Riyadh, Kingdom of Saudi Arabia, 2013–2015.
- **Prizes & Awards:** INFORMS Fellow, 2012.



Jacques-François Thisse

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** INDUSTRIAL ORGANIZATION, INTERNATIONAL TRADE, ECONOMIC GEOGRAPHY.
- **Education:** Docteur en sciences économiques, Université de Liège, Belgium, 1975.
- **Prizes & Awards:** Fellow of the Econometric Society, 1992; Fellow of the Regional Science Association International, 2003; Fellow of the European Economic Association, 2004; William Alonso Memorial Prize, 2004; Prix scientifique quinquennal Ernest-John Solvay (FNRS), 2005; European Prize in Regional Science, 2007; Doctor *Honoris Causa*, 4 universities.
- **Former positions over the last five years:** Chief Research Fellow, National Research University Higher School of Economics, Moscow, Russia; W.C. Mitchell Visiting Research Professor, Columbia University, New York, USA; and Visiting Professor, Institute of Developing Economies, Chiba, Japan.
- **Current editorial activities:** Associate Editor, *International Journal of Economic Theory*, *Journal of Economic Geography*, *Journal of Economics and Management Strategy* and *Regional Science and Urban Economics*.



Henry Tulkens

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Economic theory, public economics.**
- **Education:** Dr. jur., KU Leuven, Belgium, 1960; Docteur en sciences économiques, UCLouvain, Belgium, 1968.



Laurence Wolsey

- **Current position:** Professor Emeritus, UCLouvain, Belgium.
- **Fields of interest:** **Combinatorial optimization, integer programming, mixed integer programming, polyhedral combinatorics, branch-and-bound, branch-and-cut.**
- **Education:** Ph.D. in Mathematics, Massachusetts Institute of Technology, Cambridge (MA), USA, 1969.
- **Prizes & Awards:** Orchard-Hays Prize (with T.J. Van Roy) awarded by the Mathematical Programming Society, 1988; Lanchester Prize (with G.L. Nemhauser) awarded by the Operations Research Society of America, 1989; Euro Gold Medal awarded by the European Association of Operations Research Societies, 1994; Dantzig Prize of the Mathematical Optimization Society, 2012; John von Neumann Theory Prize (INFORMS) (with G.L. Nemhauser), 2012; Glover-Klingman Prize (with A. Agra, H. Anderson and M. Christiansen) for the best paper of the year published in Networks, 2013.

Administrative staff



Ariane Bastin
Communication officer



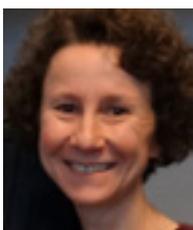
Séverine De Visscher
Administrative assistant



Catherine Germain
Office manager



Alain Gillis
Librarian and data base manager



Nancy Guillaume
Executive Director



Fabienne Henry
Administrative assistant



Anne-Marie Pessleux
Accountant



Monique Tanga
Research officer

Administrative collaborators



Maristella Angotzi
ERSA Congress manager



Nurul Hikmah Bariroh
ERSA executive assistant

6

- › [UCLOUVAIN FUNDING](#)
- › [INTERNATIONAL FUNDING](#)
- › [BELGIAN FUNDING](#)

FUNDING

FUNDING

UCLouvain Funding

FSR PROJECTS

➤ **Conic Martingales and Credit Risk Modeling**
(October 2017-November 2018)

Most often, credit risk is handled by modeling default time as first jump of Lévy processes governed by positive stochastic intensity processes. This specific setup corresponds to the standard Cox framework. However, the Doob-Meyer decomposition of the Azéma supermartingale - which ultimately needs to be modeled in the intensity approach- reveals that Cox setup is just one particular case. This is a sound motivation for investigating alternative classes of default models as conic martingales modelling.

Frédéric Vrins (LFIN and CORE, UCLouvain) is the promoter of this project. **Cheikh Mbaye** (CORE, UCLouvain) works under the scope of the project jointly financed by a FSR project and the National Bank of Belgium.

➤ **Greed, Majorization and Lattices of Unrooted Binary Trees**
(October 2017-September 2019)

We aim to extend Stott-Parker and Ram's results on greed, majorization and Huffman coding to phylogenetics. Specifically, we want to show that the space of all unrooted binary trees (or phylogenies) for a finite set of taxa defines a lattice, which orders phylogenies by their imbalance. By representing phylogenies as path-length sequence collections, we wish to prove that the imbalance ordering is closely related to a majorization ordering on real-valued sequences, which in turn induces a majorization lattice over which a number of functions of path-length sequences of phylogenies (including, among others, versions of the objectives of the Huffman Coding Problem and of the Balanced Minimum Evolution Problem) may be submodular and monotone. In this way, by appropriately combining these properties with the presence (or absence) of an isomorphism between the two lattices, we will be able to either justify the polynomial-time solvability of specific optimization problems over phylogenies or reveal structural characteristics at the core of their NP-hardness.

Daniele Catanzaro (CORE, UCLouvain) is the promoter of this project. **Martin Frohn** (CORE, UCLouvain) works on the project.

➤ **Incentive for Advancing to Step 2 of the ERC Starting Grant**
(September 2017-October 2019)

The ERC-FSR grant has been awarded by the Belgian national research science foundation (FSR-FNRS) for advancing to Step 2 of the ERC Starting Grant in 2017. The grant has been used for supporting research of PhD students on the application of high performance computing on two-stage stochastic unit commitment, as a follow-up to the HPC project. The ERC-FSR funding has also been used for visiting Professor Hogan in 2018 and 2019 so as to lay the foundations for a concrete collaboration through the Francqui foundation research professorship.

This incentive (FSR-ERC grant) is awarded to **Anthony Papavasiliou** (CORE, UCLouvain). **Quentin Lété** (CORE, UCLouvain) works on this project.

FONDATION LOUVAIN

➤ **Coalescens: Digital Technology Serving Humanity Coalescens**
(October 2017-September 2018)

Determining the sequence of genetic events that controls intra-cellular heterogeneity could significantly improve the understanding of tumor progression, suggest new prevention methods and stimulate the development of novel and more effective treatments. The project COALESCENS constitutes the first stage of an ambitious long-term multidisciplinary research program that aims to address this major challenge.

COALESCENS arises from the convergence of computer science, combinatorial optimization, algebraic combinatorics, phylogenetics of cancer, and is based on a pilot study aiming to investigate the combined use of integer programming and next generation sequencing techniques to predict tumor progression in a patient. Preliminary experiments carried out on a patient cohort affected by invasive ductal carcinoma of the breast have yielded encouraging results, by revealing the existence of both common and unknown sequences of genetic changes characterized by specific evolutionary traits. COALESCENS aims to significantly extend and deepen these preliminary results, by (i) characterizing the sequence of genetic events controlling progression of a specific tumor in a patient and (ii) classifying these sequences across large patient cohorts. COALESCENS will provide new insights into tumor progression and will pave the way for the development of new diagnostic tools that will be of fundamental assistance in clinical decision-making.

Daniele Catanzaro (CORE, UCLouvain) is the promoter of this project.

► **Color Power**
(October 2015-September 2021)

Although a substantial amount of demand response resides in the residential sector, the mobilization of residential demand response has fallen short of expectations. The participation of residential flexibility in wholesale electricity markets can have a disruptive impact on the industry. Inspired by our collaboration with MIT start-up Zome, we analyze the long-run impact of residential demand response on the profitability of various technologies through long-run equilibrium models of electricity markets.

This project is financed by Electrabel and coordinated by **Philippe Chevalier** (CORE, UCLouvain) and **Anthony Papavasiliou** (CORE, UCLouvain). **Yuting Mou** (CORE, UCLouvain) works under the scope of this project.

► **Kronos Group Chair in Strategic Sourcing and Procurement**
(September 2017-September 2020)

The Kronos Group Chair "Strategic Sourcing and Procurement" is the fruit of a collaboration between Kronos Group and Louvain School of Management of the UCLouvain. The objective of the Chair is to promote research and education in the sourcing and procurement domain, contributing to fostering the profession to continue its transformation into a value creating and strategic profession. The Chair is unique for Belgium and also launching a unique Master's level specialization in sourcing and procurement in Belgium, integrated in Louvain School of Management. The research in the Chair aims at empirical, economic and strategic studies of procurement under transformation, in particular the innovative, ethical and environmental dimensions of the area.

Per Agrell (CORE, UCLouvain), **Constantin Blome** (CORE, UCLouvain) and **Philippe Chevalier** (CORE, UCLouvain) coordinate this project sponsored by the Kronos Group, Belgium.

► **Modeling Flexibility at Sub-hourly Time Scales**
(February 2016-October 2020)

The large-scale integration of renewable energy sources is creating increasing needs for flexibility. The optimal dispatch of conventional resources at a sub-hourly time scale in order to prevent binding ramping constraints is increasing the challenges of short-term operations. This project aims at developing optimization models and algorithms that can support the optimal utilization of generator flexibility in short-term operations.

This project is financed by Electrabel and coordinated by **Anthony Papavasiliou** (CORE, UCLouvain).

► **Using Analytics and Optimization to Enable Africa to Leapfrog to Energy**
(April 2018-December 2020)

Africa has recently set ambitious renewable energy integration targets, best exemplified through the adoption of the African Renewable Energy Initiative (AREI) as well as by the large number of renewable infrastructure projects that are underway. The goals of this project are :

- To develop tools for optimizing the use of electricity in existing electric power systems, in particular optimally managing utility-scale storage in a system dominated by solar production;
- To develop tools for planning for future renewable systems, in particular randomized algorithms for obtaining optimal transmission expansion plans subject to net load and component outage uncertainty with probabilistic guarantees of optimality;

- ▶ Operating future distributed energy systems which rely less on centralized fossil fuel resources and more on decentralized renewable resources.

This project is sponsored by the Fonds de Recherche Pierre et Colette Bauchau and coordinated by **Anthony Papavasiliou** (CORE, UCLouvain). **Daniel Avila** (CORE, UCLouvain) works on this project.

MOVE-IN LOUVAIN

- ▶ **Higher Order Expansions in Estimation and Testing Models with Conditional Heteroscedasticity** (September 2016-May 2019)

"MOVE-IN Louvain" Incoming post-doc Fellowships is a transnational fellowship programme developed by UCLouvain in partnership with UNamur and Université Saint-Louis with the support of the European Commission (Marie Curie actions).

Dimitra Kyriakopoulou (CORE, UCLouvain) is one of the laureate of the programme. She works under the supervision of **Christian Hafner** (ISBA and CORE, UCLouvain). Her research targets at:

- ▶ Extending the current literature of conditional heteroskedastic models, in particular so-called GARCH models (generalized autoregressive conditional heteroscedasticity), for a type of extension with in-mean specification, where the "in-mean" term can be interpreted as a risk-premium such as in the so-called capital asset pricing model (CAPM).
- ▶ Addressing the issue of skewness of returns in conditionally heteroskedastic models with positive risk premium.
- ▶ Developing analytical higher order asymptotics of the Edgeworth type that allow for more accurate estimation of the distribution of test statistics in GARCH-type models.
- ▶ Extending the study of conditional heteroskedastic models to the nonstationary case.

- ▶ **The Cost of Hiding: Content Quality, Social Welfare and Privacy Concerns** (August 2018-March 2020)

This research project aims to investigate how the growing availability of instruments to i) block the invasiveness of ads and profiling, and ii) to protect individual privacy might or might not lead to unintended effects for the different economic agents.

Leonardo Madio (CORE, UCLouvain) works on the project under the supervision of **Paul Belleflamme** (CORE, UCLouvain).

International Funding

EUROPEAN PARLIAMENT PROJECT (ENERGY TRANSITION FUND

- ▶ **Energy technology modelling framework for Policy support towards a Cost effective and Sustainable Society in 2030-2050 (EPOC 2030-2050)** (October 2018-May 2023)

The EPOC project under the energy transition fund combines the expertise of 14 Belgian academic partners to improve the current state-of-the art energy models, providing a consistent calculation for the long-term energy future in Belgium

The project is coordinated by EnergyVille/VITO, and the participating research institutes are: Imec, KU Leuven, UHasselt, ICEDD, the Federal Planning Bureau, WaterstofNet, Transport & Mobility Leuven, Ugent, UMons, KMI (Het Koninklijk Meteorologisch Instituut van België), UCLouvain, ULiège and ULB

Céline Gérard (CORE, UCLouvain) and **Yuting Mou** (CORE, UCLouvain) are involved in this project at CORE under the supervision of **Anthony Papasiliou** (CORE, UCLouvain).

EUROPEAN COMMISSION PROJECTS

► **Expectations and Social Influence Dynamics in Economics (ExSIDE)** (January 2017-December 2020)

The Innovative Training Network ExSIDE combines an interdisciplinary research agenda with an innovative European joint doctoral training program, which provides doctoral fellows with a broad range of expertise and skills needed for a thorough analysis of expectation formation processes and their role in economics. Both the research projects and the training activities combine work in behavioral economics, psychoanalysis, opinion formation, network theory, agent-based simulation and economic modelling in different areas. The academic training will be complemented by extensive transferable skills training measures, intersectoral training measures, provided by non-academic partners, and career development training. Interaction with stakeholders, policy makers and the general public will play an important role in pursuing the ExSIDE agenda and disseminating the results. The ExSIDE consortium consists of eight leading European universities and nine non-academic partners.

Vincent Vannetelbosch (CORE, UCLouvain) coordinates the program at UCLouvain. Chenghong Luo, Mariam Nanumyam and Akyal Taalaibekova are currently enrolled in this program at CORE.

PUBLIC INSTITUTIONS PROJECTS

► **Dynamic Modelling of Recovery Rates with Application to the Risk Management of Financial Products** (January 2018-December 2018)

Being extremely simple (straight bonds) or very complex (credit default swaps) the value of derivatives products all depend on a same factor: recovery rate. The later represent the ratio of the invested amount to the face value that will be recovered by the investor in case of default of the underlying reference entity. It is obvious to see that the closer this rate is from 100%, the lower should be the risk premium. Nowadays, the modeling of this factor is performed in an admittedly naive way: it is essentially considered as a constant, which value needs to be determined. Our goal in this project is to propose a more meaningful approach, accounting for dependency with other risk factors. Several empirical analyses have been performed so far, but none of them had the ambition to understand its impact on derivatives products. This is precisely the scope of this project. It is handled in cooperation with Paris I Panthéon-Sorbonne and the Université d'Evry (Paris).

Frédéric Vrins (LFIN and CORE, UCLouvain) is the promotor of this project cofunded by Wallonie-Brussels International and the Ministry of Europe and Foreign Affairs In France.

► **Huge-Scale Sparse Optimization: Theory, Algorithms and Applications** (November 2014-August 2018)

Experiments and observations in many areas of science and engineering are currently generating terabytes of data. In another perspective, as the increasingly huge amounts of information are typically dispersed in space and time, the Big Data paradigm is inherently linked to network paradigm (a network system consists of multiple interacting subsystems, connected through a network which enables the subsystems to coordinate their activities; e.g. power grids). Learning from these large volumes of data is expected to bring significant science and engineering advances along with improvements in quality of life. However, the efficient exploitation of big data demands the development of efficient computational methods. Classical first/second order optimization algorithms are not designed to scale at instances of huge sizes. As a consequence, new mathematical programming tools and methods are required to solve efficiently these big data problems. The goal of this project is to develop new and efficient tools and optimization algorithms with low per-iteration cost and good scalability properties for solving Big Data optimization problems. The project brings together researchers with expertise in optimization capable of dealing with the big data network setting.

François Glineur (INMA and CORE, UCLouvain) and Ion Necoara (Politechnica University of Bucharest) are the investigators of this project initiated by the Romanian Academy of Sciences and funded by the World Bank Institute in Romania.

► **Networks, Innovations, Culture, Employment and Growth** (January 2016-December 2018)

It is well known that social structures, the position of individuals in these structures and social segregation determine the success of individuals, groups and societies as a whole. We will formally introduce social structures in the economic analysis in

order to determine whether part of the difference in wages between men and women or between different socio-economic groups can be explained by their position in social structures and social segregation, and will also analyze their implications for professional success.

The project is financed by the Spanish Ministry of Economy and Competition. **Ana Mauleon** (Université Saint-Louis, Brussels and CORE, UCLouvain) and **Vincent Vannetelbosch** (CORE, UCLouvain) are external investigators of this project coordinated by Javier Gardeazabal and Maria Paz Espinosa (Universidad Del País Vasco, Bilbao, Spain).

Belgian Funding

BELSPO: Belgian Science Policy

BRAIN Projects

- **Application of High Performance Computing in the Short-term Scheduling Integrated Economic Modeling of Material Flows (IECOMAT)**
(December 2014-March 2019)

The IECOMAT project develops complementary numerical and analytical tools designed to study a particular aspect of sustainable material management, the circular economy. The models to be employed and to be developed range from input-output models over partial, computable and general equilibrium models as well as analytical industrial organisation models of economic incentives. The project will deliver different modeling frameworks, scenario analyses, a wide variety of policy analyses and ultimately an assessment of the potential of a more circular economy model for Belgium.

The IECOMAT project brings together a multidisciplinary team of experienced scientists from material and environmental engineering, environmental economics, industrial organisation and stakeholder consultation practice. This multidisciplinary team from a leading Flemish research institute on sustainable material management (VITO) and two research universities (KU Leuven and UCLouvain) interact intensively. This leads to an interdisciplinary analysis of key scenarios for the Belgian economy. Some specific areas of expertise are subcontracted to national and international specialists in their domain. In all approaches, three fundamental perspectives are included: physical material flows, environmental effects and socio-economic impacts, and business incentives. Therefore, the IECOMAT project is about integrated assessment models for the transition towards a circular economy. In order to strengthen a transdisciplinary dimension, the input of policy makers, practitioners and business stakeholders is actively sought.

Johan Eyckmans (KU Leuven) and Sandra Rousseau (KU Leuven) are the promoters of this project coordinated at CORE by **Paul Belleflamme** and **Thierry Bréchet**. **Thuc Huan Ha** (CORE, UCLouvain) works under the scope of this project.

- **Impact of Green/Blue Spaces on Specific Morbidity and Cause-Specific Mortality in Belgium (GRES-HEALTH)**
(July 2015-December 2019)

Living in green/blue areas is associated with better health. This may be due to low air and/or noise pollution, opportunities for physical activity, facilitation of social contacts, and promotion of recovery from fatigue and stress. Yet, socio-economic (SE) factors also explain inequalities in health and access to green/blue spaces. The GRES-HEALTH project evaluates the associations between living in/close to a green/blue area on morbidity and mortality in Belgium. It assesses all-cause and cause-specific mortality, specific morbidities and perceived health, considering environmental pollutants and SE factors.

The project includes individuals registered in the Belgian censuses of 1991 and/or 2001. Three levels of observation are studied: individual, statistical sector (SS) and group of SS, following individual and ecological designs. Mortality information is based on the National Mortality Database (a linkage between cause-specific mortality (2001-2010), perceived health (2001 census) and SE factors (1991 and 2001 censuses)). Morbidity information (2004-2012) is derived from the IMA (Intermutualistisch Agentschap) database, which contains reimbursement data of prescriptions. For green/blue spaces, the surface, shape, accessibility and type are calculated for each SS. Residential area-specific exposure to air pollutants is obtained from satellite images. Traffic noise databases are used whenever possible. We will consider SE factors such as material deprivation, education, and occupation. The analyses will be conducted separately in different age specific populations and types of area (urban, sub-urban, rural). We will use multilevel models for clustered data within geographical areas. Interactions of green/blue spaces with air pollution and SE factors will be evaluated and stratified analyses in areas with similar SE and environmental characteristics will be performed. Moreover, specific population groups (gender, employment status) will be considered. The GRES-HEALTH project will improve

the scientific knowledge about the hitherto uncertain associations between living close to green/blue spaces and health.

Benoît Nemery (KU Leuven) is the coordinator of this project. The other promoters are **Isabelle Thomas** (CORE, UCLouvain), Tim Nawrot (Universiteit Hasselt), Catherine Bouland (Université libre de Brussels), Patrick Deboosere (Vrije Universiteit Brussels) and An Van Nieuwenhuysse (Institut de Santé Publique, Brussels). **Sonia Trabelsi** (CORE, UCLouvain) works under the scope of this project.

➤ **Measuring Equivalent INcomes: The Implementation of Individual Well-being Measures from Belgian Data (MEQIN)**
(October 2013-December 2018)

This project is dedicated to the production, the analysis and the diffusion of a socio-economic database of Belgian households; the database is constructed in such a way that individual well-being levels can be measured according to several concepts of well-being, with a particular focus on equivalent income.

Béa Cantillon (Universiteit Antwerpen), Bram De Rock (Université libre de Brussels), **François Maniquet** (CORE, UCLouvain) and Erik Schokkaert (CORE and KU Leuven) are the promoters of this project.

➤ **Nature impact on Mental health Distribution (NAMED)**
(July 2017-July 2021)

The NAMED project investigates how the built and non-built environment impact the mental wellbeing of Brussels' citizens. Several international studies have shown that the built environment has negative impacts on mental health, while others highlighted the beneficial impacts of natural areas on this component, stress, but also more generally on well-being. In Belgium, only limited research is currently available. The NAMED project tackles the topic with different research perspectives. From a quantitative perspective, HIS data are used to investigate the relationships between mental health and the built/non-built environment, while accounting for demographic, socioeconomic factors, lifestyle, air and noise pollution. In parallel, from a qualitative analysis perspective, Brussels residents are interviewed to record individual perceptions about the quality of their living environment, on their mental wellbeing and on the link between those two. Local stakeholders and experts are also consulted through focus groups and extended peer evaluation of the results. By gathering specialists in social, geographical, medical, epidemiology sciences and involving citizens and local stakeholders of the Brussels-Capital Region, the project intends to combine disciplines and perspectives in order to get a comprehensive understanding of the topic.

Hans Keune (Universiteit Antwerpen) is the coordinator of this project. The other promoteurs are Hilde Bastiaens (Universiteit Antwerpen), Tim Nawrot (Universiteit Hasselt), Roy Remmen (Universiteit Antwerpen), **Isabelle Thomas** (CORE, UCLouvain) and An Van Nieuwenhuysse (Institut de Santé Publique, Brussels). **Madeleine Guyot** (CORE, UCLouvain) and **Sonia Trabelsi** (CORE, UCLouvain) work under the scope of this project.

EUROPEAN COMMISSION

European Research Council (ERC)

➤ **Accelerated Convex Optimization (ACCOPT)**
(September 2018-September 2023)

The amazing rate of progress in the computer technologies and telecommunications presents many new challenges for Optimization Theory. New problems are usually very big in size, very special in structure and possibly have a distributed data support. This makes them unsolvable by the standard optimization methods. In these situations, old theoretical models, based on the hidden Black-Box information, cannot work. New theoretical and algorithmic solutions are urgently needed. In this project we will concentrate on development of fast optimization methods for problems of big and very big size. All the new methods will be endowed with provable efficiency guarantees for large classes of optimization problems, arising in practical applications. Our main tool is the acceleration technique developed for the standard Black-Box methods as applied to smooth convex functions. However, we will have to adapt it to deal with different situations.

The first line of development will be based on the smoothing technique as applied to a non-smooth functions. We propose to substantially extend this approach to generate approximate solutions in relative scale. The second line of research will be related to applying acceleration techniques to the second-order methods minimizing functions with sparse Hessians.

Finally, we aim to develop fast gradient methods for huge-scale problems. The size of these problems is so big that even the usual vector operations are extremely expensive. Thus, we propose to develop new methods with sublinear iteration costs. In our approach, the main source for achieving improvements will be the proper use of problem structure.

Our overall aim is to be able to solve in a routine way many important problems, which currently look unsolvable. Moreover, the theoretical development of Convex Optimization will reach the state, when there is no gap between theory and practice: the theoretically most efficient methods will definitely outperform any homebred heuristics.

Yurii Nesterov (CORE and INMA, UCLouvain) is the promoter of this project. **Nikita Doikov** (INMA and CORE, UCLouvain), **Mihaj Florea** (INMA and CORE, UCLouvain), **Geovani Nunes Grapiglia** (INMA and CORE, UCLouvain) and **Anton Rodomanov** (INMA and CORE, UCLouvain) work under the scope of this project.

FNRS: Fonds de la Recherche Scientifique

Aspirant

➤ Economic Inequality, Political Polarization and Voter Turnout (October 2018-September 2020)

In this research, we investigate whether inequality may be responsible for the changes in the political spectrum that have recently occurred in many countries, exploring the link between economic inequality, political polarization and participation, as measured by voter turnout. Indeed, the substantial increase in economic inequality that has been registered in many countries during the past decades is not free of consequences in the political sphere. In fact, when economic conditions are harsher, economic policy becomes a salient issue in the political debate and voters' preferences change accordingly. If politicians do not respond by adapting their proposals to the preferences of voters, this can only result in lower electoral participation. However, economic circumstances also affect political competition. In particular, during periods of high economic inequality we observe higher political polarization, which may in turn have a positive effect on voters's participation.

A model of political competition and turnout is developed that is able to explain the relationship between economic inequality and electoral participation, by taking into account the effect of inequality on political polarization. We complement the theoretical study with an empirical analysis of the effect of inequality on polarization and the resulting impact on participation, and, focusing on the US, we try to separately identify the causal effects of inequality and of polarization on turnout. Finally, we extend the analysis of the triple relation inequality-polarization-turnout to contexts of multi-party competition, by developing a citizen-candidate model, where we endogenize turnout by introducing the mismatch cost as a potential source of abstention. There, we try to explain both the shift of existing parties towards more extreme positions, and the emergence of new parties, of which countries like Italy, Spain and Germany are a clear example.

François Maniquet (CORE, UCLouvain) is the promoter of this project. **Erika Pini** (CORE, UCLouvain) works on this project.

EOS Projects

➤ Individual Welfare Analysis Based on Behavioural Economics (IWABE) (January 2018-December 2021)

Economists evaluate social and economic policies based on their impact on the individual well-being of the members of society. Typically this measurement depends on the crucial assumption that individuals have well-behaved (i.e. transitive and complete) preferences. Motivated by the overwhelming empirical evidence from psychology and behavioural economics, we aim at developing the methodological tools for analysing individual welfare, while allowing for non well-behaved preferences (i.e. seemingly inconsistencies in the behaviour of agents). For doing this we will explore an intermediate approach that is in between the agnostic approach (i.e. robust conclusions without specific explanation for the inconsistencies) and the model approach (i.e. an analysis based on a specific model explaining non well-behaved preferences). For the empirical part, we will extensively use the new and largely unexplored MEqIN data set that was gathered by the PIs of this project. This data set allows to compare several methods for measuring well-being and contains detailed information on all the adults of the selected households. In the applications we will restrict our attention to four main dimensions of well-being: health, material well-being, employment status, and the family situation. In this respect we will also recontact the surveyed households to gather extra data related to our research questions and this will make the (publicly available) MEqIN data set even more attractive.

Bram de Rock (Université libre de Bruxelles) is the supervisor of the project. **Johannes Johnen** (CORE, UCLouvain) and **François Maniquet** (CORE, UCLouvain) are involved in the project at CORE. **Seyed Hassan Nostratabadi** (CORE, UCLouvain) works under the scope of this project.

➤ **Structured Low-rank Matrix/Tensor Approximation: Numerical Optimization-based Algorithms and Applications (SeLMA)**
(January 2018-December 2021)

Today's information society is centered on the collection of large amounts of data, from which countless applications aim at extracting information. They involve the manipulation of matrices and higher-order tensors, which can be viewed as large multi-way arrays containing numerical data. Key to their successful and efficient processing is the proper exploitation of available structure, and in particular low rank. This project aims to contribute innovative structure-exploiting methods based on the paradigm of low-rank matrix/tensor approximation, with a strong mathematical and algorithmic emphasis, and to apply them to large-scale data analysis, information retrieval and modelling. In WP 1, which supports and facilitates progress in the other WPs, we develop robust and computationally efficient algorithms for optimal low-rank approximation w.r.t. a given criterion, including algorithms that estimate the rank when not specified by the user. In WP2 we use low-rank approaches to tackle the fundamental problem of computing matrix products as cheaply as possible and to perform advanced curve fitting. In WP3 we develop large-scale structure-exploiting algorithms for nonnegative matrix factorization, a powerful tool to extract information from data, and for large-scale pattern recognition, which is at the heart of machine learning. Finally in WP 4 we exploit low-rank structure in the design of globally optimal methods for system identification, model reduction and signal processing.

Ivan Markovskiy (Vrije Universiteit Brussel), and Marc Van Barel (KU Leuven) are the administrative promoters of the project. Mariya Kamenova Ishteva (Vrije Universiteit Brussel), Lieven De Lathauwer (KU Leuven), Bart De Moor (KU Leuven), Panos Patrinos (KU Leuven), Pierre-Antoine Absil (INMA, UCLouvain), **François Glineur** (INMA and CORE, UCLouvain) and Nicolas Gillis (U Mons) collaborate to the project.

FRESH Projects

➤ **Evaluating the Effectiveness of Price-based Policies in Reducing Unhealthy Food demand under Models of «Non-standard» Consumption Behaviour**
(January 2017-December 2018)

The subject of this research is to address the obesity issue in the context of a public health and market efficiency perspectives. The main objective of the research is to test empirically whether consumer behavior (and response to price changes) are consistent with the rational model of consumer choice. Different deviations from the rational model will be tested such as the attention bias, the present bias and the projection bias. This empirical testing will be carried out based on scanning data from a supermarket in Belgium. The demand system will be estimated separately for two different categories of junk food: salty snacks and sweet sugar beverages. The expected output is the estimation of own price and cross price elasticities and income elasticities of the demand for healthy and non-healthy food. The estimation will also provide the empirical distribution of addicted and inattentive consumers.

Jean Hindriks (CORE, UCLouvain) is the promoter of this FRESH-PDR project. **Valerio Serse** (CORE, UCLouvain) works under the scope of the project.

➤ **Strategic Supply Chain Design and Impacts of Demand Uncertainty**
(February 2014-November 2018)

The strategic design of its logistics network highly impacts the performance of a company, determining its tactical and operational decisions. Therefore, this must be taken into account when establishing the network. In this project, we are particularly interested in demand uncertainty, which is increasing in practice. It has two main implications for the supply chain network: safety stocks to react in short-term and robustness to adapt in medium term. These effects are incorporated into a mathematical location-inventory model, heuristics are developed, and managerial insights are provided.

Jean-Sébastien Tancrez (LSM and CORE, UCLouvain) is the promoter of this project. **Matias Schuster Puga** (CORE, UCLouvain) works under the scope of the project.

FRIA Project

➤ Evaluating the value of Flexibility in Power System (October 2018-September 2020)

The goal for this research is to evaluate the profitability of flexible assets in the context of the large-scale integration of renewable energy on the electricity markets. We characterize a flexible asset as an asset that can quickly adjust the quantity of its output. Some examples of flexible assets are combined cycle gas turbine and pumped hydro storage. This increased integration of renewable energy results in two paradoxical impacts:

- On the one hand, the increase of renewable production implies that the market requires more flexibility close to real time.
- On the other hand, flexible units are currently being mothballed or retired in Europe due to financial losses that are related to high marginal costs, despite the fact that these resources are offering valuable reserve services to the system.

Therefore, in order to ensure power system security, we need to increase the profit of flexible assets. We study this need for extra remuneration of flexible assets in two ways:

- We first analyze the market design problem. The idea of this line of research is to evaluate the impact of a new remuneration strategy, referred to as scarcity pricing, on flexible generator profits.
- We additionally analyze a bidding strategy problem. Our main focus is on the continuous intraday market which is one of the short-term electricity markets that is becoming increasingly important but for which there still exists a limited amount of research. We believe that the CIM is important due to the fact that it allows valuable adjustments to renewable forecast errors, which are becoming increasingly significant in recent years due to the increasing integration of renewable resources.

Anthony Papavasiliou (CORE, UCLouvain) is the promoter of this project. **Gilles Bertrand** (CORE, UCLouvain) works on this project.

PDR Projects

➤ Following trucks with GPS data: Measuring and Modelling Routes for a Spatially Smarter and more Equitable Taxation (December 2018-November 2020)

The increasing number of trucks on the roads generates number of debates about sustainability. Transport quantitative analysis often rely on spatially aggregated and/or non exhaustive data (samples). This project aims at using unconventional «big data» (generated by on-board mandatory GPS devices) for refining freight .transport geographies in Belgium. Three questions are raised in this project. (1) Is it possible to characterize each truck trace with one of several indices and make an insightful typology of the spatial shapes of routes ? (2) Is it possible to easily shift from raw GPS data to an origin-destination (places) matrices useful for transport modelling? (3) How far are the spatial realities extracted from this origin destination transport modelling or from current knowledge of the Belgian economic geography and logistics organization?

Improving the knowledge in this domain is important for two reasons. Scientifically, it is to understand the geographical complexity of logistics and to solve some methodological issues such as to measure (quantify) unambiguously the «traces» of the trucks. In terms of policy issues, it is important to better understand and evaluate the spatial consequences of the kilometeric tax in a heterogeneous space (Belgium). It is the actual uniform kilometeric taxation environmentally, economically and socially equitable? Could a taxation varying in space and time be more efficient? Yet could this new taxation generate new counterproductive effects?

Isabelle Thomas (CORE, UCLouvain) is the promoter of this project. **Arnaud Adam** (CORE, UCLouvain) will work on this project as from September 2019

➤ Mobilizing Flexible Demand in Electric Power Systems through Service Quality Differentiation (October 2017-September 2019)

The recent large-scale integration of renewable energies in electric power systems has resulted in various challenges in power system operations, due to the unpredictable, highly variable and non-controllable fluctuation of these resources. This has resulted in a growing demand for the incorporation of flexibility in the Central Western European electricity system in order to balance renewable supply. Although storage devices can act as a source of flexibility, their cost is prohibitive for offering a definite solution to this problem. However, the only part of the electrical power system that is currently optimized is the high-voltage system. Consequently, there is a large amount of unused flexible resources connected to the low voltage

system, coming from flexible residential and commercial demand, which can be exploited efficiently in order to break the current barriers that are bounding the growth of renewable energy integration. The project proposes a color-tagging system that enables consumers to set “traffic lights” on their residential plugs: (i) green color indicates cheap power that can be interrupted at all times; (ii) orange color, power that can be interrupted in emergency conditions; (iii) red color, power that cannot be interrupted. Inspired by existing research on the integration of the color-tagging system into wholesale electricity market (macro scale), the goal of this project is to focus on the application of this demand response scheme at individual households and to infer the level of flexibility that can be leveraged for a consumer without excessively impacting perceived quality of service (microscale).

Anthony Papavasiliou (CORE, UCLouvain) is the promoter of this project. **Céline Gérard** (CORE, UCLouvain) first worked on this project on an Aspirant FNRS Grant (2017-2019) and on a PDR project since October 2019.

➤ **Social Preferences and the Persistence of Poverty** (October 2016-September 2020)

This project is aiming to theoretically and empirically explore how the social components of preferences such as identity, social norms and social categories, may help explain the persistence of poverty and social exclusion in rich societies.

François Maniquet (CORE, UCLouvain) is the promoter of this project.

➤ **Self-selection in Social Dilemmas** (January 2018-December 2021)

Whenever people need to decide with whom to initiate a strategic interaction they use information on their potential partners. As partners are aware of the role this information plays, they will try to control what is made available and will anticipate how their decisions in other situations affect that information, and as a consequence their future interactions. Although, group formation and network dynamics are highly influenced by this information-sharing dilemma, there is little insight into which information people prefer to disclose and how this affects trust, group compositions and strategic decision-making. Using methods of experimental economics and theoretical modeling we here will examine these entangled dynamics within the context of a sequential prisoners dilemma (SPD) game extended with a partner selection stage. Through three experiments we will investigate what information people disclose in the partner selection stage of the game, whether these differences lead to self-selection and thus different outcomes in cooperation and trust and how, when people can have multiple partners, this disclosure affects network structure. In parallel, but intertwined with the experimental part, minimal models of this co-evolutionary dynamics will be developed and analyzed to provide insight into the broader guidelines that induce self-selection and network stability. These models will provide information concerning the importance of certain parameters in the experiments and will be refined through the experimental results. These refinements should lead to models with certain explanatory capacities, which will be validated using information on a concrete economical situation.

Tom Lenaerts (Université libre de Brussels), Georg Kirchsteiger (Université Saint-Louis, Brussels) **Ana Mauleon** (Université Saint-Louis, Brussels) and **Vincent Vannetelbosch** (CORE, UCLouvain) are the promoters of the project. Pierre de Callataÿ works under the scope of this project.

➤ **The Role of Information in Social Dilemmas** (July 2018-July 2022)

Agents collect (and disclose) information before starting strategic interactions with each other's (including forming groups). This work ambitions to analyze how the information and the strategic interactions affect each other. The analyze of the influence of the available information on the individuals' strategic choices has already received some attention. Yet, this work will have the originality to encompass an analyze of the influence of the strategic interaction on the information collected previously. This means that we'll explore a framework where information sharing is an endogenous choice of individuals. Many questions will be addressed in this work, such as: which kind of information will be disclosed? Which kind of groups agents will form? How this will influence the social welfare? etc.

Ana Mauleon (Université Saint-Louis, Brussels) and **Vincent Vannetelbosch** (CORE, UCLouvain) are the promoters of the project. **Pierre de Callataÿ** (CORE, UCLouvain) works on this project.

➤ **Uncertainty, Macroeconomic Fluctuations and Asset Prices**
(October 2015-September 2019)

This project studies the relationship between uncertainty, macroeconomic fluctuations, financial markets and asset prices. In particular, we are interested at answering of questions such as: how does uncertainty influences macroeconomic variables such as aggregate level of prices or aggregate economic activity? Does the impact of uncertainty change in bad times? Is the relationship between macroeconomic and financial variables time dependent? What is the impact of uncertainty on asset prices? We answer these questions by building a macro-finance model. In this setting the dynamics of government bond prices, macroeconomic and finance variables are linked by no arbitrage conditions and uncertainty enters in the model in the form of parameter instability. We develop and apply Bayesian econometrics models to explore instability phenomena and to derive new measures of uncertainty. Bayesian econometrics is well known for its flexibility in modelling uncertainty. Even if the model is initially applied to the government market, it can be used to analyze the relationship between, uncertainty, macroeconomic dynamics and prices of other contracts such corporate bond, swaps or credit derivatives.

Improving our knowledge in this area is crucial for at least two reasons. From an academic perspective, it is interesting to more deeply understand (1) how the relationship between macro-economic variables, financial variables and asset pricing in time of turbulence, and (2) how uncertainty can influence these variables. This is a new area of research that can improve our understanding of economic models. From an applied perspective, understanding how uncertainty influences macroeconomic conditions or asset prices or the government yield curve is crucial for policy makers, who aim at improving general economic conditions and the efficiency of financial markets.

Leonardo Iania (LFIN and CORE, UCLouvain) is the promoter of this project.

CDR Projects

➤ **Credit Risk Modelling and Stochastic Recovery Rates**
(2018-2019)

This project aims at bringing two contribution to credit risk models used in the context of banking supervision. First, the new regulatory framework known as Basel III provides guidelines for better practices in terms of risk management of financial institutions. Among others, it provides banks with so-called «standard formulae» that are used to determine the capital that needs to be set aside to account for unexpected losses. Yet these formulae treat major risk drivers in a simplistic way, under the form of rather arbitrary multiplicative factors. Our ambition here is to analyze the relevance of these formulae in light of recently developed credit risk models. In particular, we would like to evaluate «how bad» do these standard formulae perform in the context of counterparty credit risk, a very topical problem in this context of financial and economic crisis. Second, we would like to enrich these models by accounting for another risk factor, namely the recovery rate. The recovery rate of a firm expresses on a relative basis the outstanding debt that can be recovered from a firm in case of default, via an auction process. Several authors studied the relationship between recovery rates and macroeconomic factors. Surprisingly however, there have been very few attempts of including those in default credit risk models as such. In spite of its acknowledged importance, it is most often disregarded in practice. One of the main reason is, we believe, the lack of specific mathematical tools available to handle this in a sound way. Hence, our second objective in this project is to rely on novel stochastic processes (namely, phi-martingales and lazy clocks) to model the recovery rate risk, incorporate it in existing credit models, and investigate the impact for financial institutions. We shall therefore analyze the dynamics of recovery rate quotes via specific databases, like Moody's and Markit. We shall then calibrate the models and compare the resulting figures to the standard formulae of Basel III.

Frédéric Vrins (LFIN and CORE, UCLouvain) is the promoter of this project.

➤ **Information and (Dis)integration of Financial Markets**
(January 2016-December 2018)

We analyze two aspects related to information extraction and market functioning, namely the extraction of market expectations in the bond market and the interdependence between the bond and stock markets. By extracting market expectations from the bond markets and identifying the transmission of shocks from the bond to the equity markets, we aim to better understand the dynamics of financial contagion which is likely to hit the real economy again in the coming years.

Leonardo Iania (LFIN and CORE, UCLouvain) is the promoter of this project.

➤ **Uncertainty and Monetary Policy**
(January 2018-December 2019)

This project will study how uncertainty and market fragmentation can impact the transmission of monetary policy to real activity and financial markets. We will be interested in uncertainty surrounding both economic conditions and the conduct of monetary policy itself.

Leonardo Iania (LFIN and CORE, UCLouvain) is the promoter of this project.

FRANCQUI FOUNDATION

➤ **Francqui Foundation Research Professorship**
(September 2018-August 2021)

Anthony Papavasiliou has received the 2018-2021 Francqui Foundation research professorship

The Francqui Foundation grants a mandate from Francqui Research Professor at the University for a period of 3 years (2018-2021), a period of 2 years, followed by a third year after approval by the Foundation during the course of the mandate. With this mandate, the Foundation gives the opportunity to a professor or a young researcher to dedicate himself to research, with a reduced teaching assignment.

The mandate is aimed at researchers, for whom a reduction of the teaching assignment represents added value for the university of the candidate; it is aimed, in particular, at professors or young researchers of an exceptionally high level, whose research is part of a current and interesting field of research and whose scientific and international influence contributes to an elevated standing of the Institution.

Professor Papavasiliou will use this opportunity in order to advance the research within his PhD group, and strengthen collaborations with international research group. Regular visits are foreseen at Harvard University, hosted by Professor William Hogan.

FÉDÉRATION WALLONIE-BRUSSELS (ARC PROJECTS)

➤ **Design of a Sustainable, Adequate and Safe Pensions (SAS Pensions)**
(September 2018-August 2023)

The provision of replacement incomes (pensions) for old people is among one of the main achievements of modern advanced economies. Historically, the State and other entities successfully organized the provision of public pensions. There is no doubt that this contributed to the wellbeing of elderly citizens. It is also likely to have played a significant role in the reduction of old-age poverty. However, public pension budgets are now increasingly challenged by demographic and economic developments, namely rapid population ageing combined with slow(er) economic growth. Hence, policy makers around the world are confronted with the challenging task of reforming existing pension systems.

The interdisciplinary research project aims at critically assessing the key conditions that a public pension system should fulfil to be successfully reformed. Our hypothesis is that there are three such conditions: i) financial sustainability, ii) social adequacy and iii) safe governance. Hence, the 'SAS' acronym.

The goal of this project is to identify the pension architecture that is the most likely to generate SAS pensions. That research will rest on diverse approaches (conceptual, numerical, empirical and normative) to assess the properties of various possible pension architectures, through the prism of SAS criteria.

Alexia Autenne (JURI, UCLouvain-FNRS), Pierre Devolder (ISBA, UCLouvain), Axel Gosseries (ISP and JURI, UCLouvain-FNRS), **Jean Hindriks** (CORE, UCLouvain) and Vincent Vandenberghe (IRES, UCLouvain) are the promoters of this project. **Sefan Cetine** works under the scope of this project..

➤ Mining and Optimization of Big Data Models (BidMed)

(September 2014-August 2019)

Computational science has entered the era of Big Data, fueled by unparalleled amounts of data coming from high-throughput technologies and electronic records collected by various sensors and communication devices. This trend is particularly visible in communication and social networks, where a growing number of individuals are more and more frequently connected to the Web and carry mobile sensors such as smart phones. This allows the gathering of data on human and social interactions at a very large scale. The efficient exploitation of that data raises important engineering, ethical and legal questions, but also demands the development of efficient computational methods.

This project aims at developing a theoretical, principled framework on which to build efficient algorithms tailored for the mining and optimization of Big Data models, i.e., for the extraction of high-level information and the subsequent identification of optimal decisions. Applications to a broad range of social, economic, health and urban problems are expected.

François Glineur (INMA and CORE, UCLouvain) is the promoter of this project. **Pierre-Antoine Absil** (INMA, UCLouvain), **Vincent Blondel** (INMA, UCLouvain), **Jean-Charles Delvenne** (INMA and CORE, UCLouvain), **Renaud Lambiotte** (UNamur) and **Yurii Nesterov** (CORE and INMA, UCLouvain) are other coordinators of the project.

➤ Negative and Ultra-low Interest Rates: Behavioural and Quantitative Modelling (NeMo)

(September 2018-August 2023)

Interest rates are a cornerstone of economics and finance. They are at the foundation of asset pricing and monetary policy, and more generally of all intertemporal choices made by market participants and institutions every day, with huge consequences for the economic activity and wellbeing of our societies. Until recently, it was assumed (mostly implicitly) that interest rates could only possibly be positive. Notwithstanding, in the wake of the financial crisis initiated in 2008, major central banks of developed countries have been brought to conduct rates policies that turned them negative. The consequences of such a paradigm shift are both potentially huge and not well understood yet. This research project aims at shedding light on these consequences, both from an academic and a policy viewpoint, following three intertwined research lines that bring together a multidisciplinary team of researchers working on behavioral finance, macro finance, and quantitative finance.

Catherine D'Hondt (LFIN, UCLouvain), Julio Dávila (CORE, UCLouvain), Leonardo Iania (LFIN and CORE, UCLouvain), Christian Hafner (ISBA, UCLouvain), Olivier Corneille (IPSY, UCLouvain) and Frédéric Vrins (LFIN and CORE, UCLouvain) are the promoters of this project. Emir Effendic (IPSY, UCLouvain), Aleksandar Todorovic (LFIN, UCLouvain) and, Linqi Wang (LFIN, UCLouvain) are involved in this project.

➤ Social and Economic Network Formation under Limited Farsightedness: Theory and Applications

(October 2015-September 2020)

The global objective of the research project is to deepen our understanding of social and economic networks by bridging the gap between two approaches to network economics: the social networks approach and the Industrial Organization (IO) approach. The research activities will be articulated around the following three axes:

- Limited farsightedness in network formation;
- Networks in the knowledge economy;
- Group symbols and conventions in networks.

Ana Mauleon and **Wouter Vergote** (Université Saint-Louis, Brussels and CORE, UCLouvain) are the promoters of this project. **Jérôme Dollinger** (CORE, UCLouvain) and **Simon Schopohl** (Université Saint-Louis) work under the scope of this project.

RÉGION BRUXELLOISE (INNOVIRIS PROJECTS)

➤ A New Look on the Inter-Relationships within the Metropolitan Area of Brussels

(January 2015-December 2018)

The BRU-NET project aims at taking a new look at interactions within the Brussels metropolitan area. Our objective is to understand how people interact, work, move and entertain themselves within their living environments. We seek to develop

new methodologies based on existing ones to allow a specific and objective understanding of the social, economic and morphologic organisation of the Brussels metropolitan area.

Isabelle Thomas (CORE, UCLouvain) and **Jean-Charles Delvenne** (INMA and CORE, UCLouvain) coordinate this project. **Arnaud Adam** (CORE, UCLouvain), **Olivier Finance** (CORE, UCLouvain) work under the scope of the project.

➤ **Express Shipment Service Network Design: Challenges, Advances and Robustness**
(February 2014–November 2018)

In this project, a collaborative framework has been established between UCLouvain and FedEx Express Europe (FedEx), aiming to develop fundamental knowledge, modeling techniques and algorithms for the optimization of the air network of express delivery companies. The benefits obtained in such Operations Research projects have demonstrated to be valuable for both academic institutions and business enterprises. The main objective of the project is to further explore and develop the express shipment service network design problem (ESSND), i.e. how to plan and schedule flights in order to allow an efficient on-time delivery of packages within tight window times. To attain this objective, we have defined two main research directions: first, to extend the current ESSND models to multi-hub environments; and second, to propose robust optimization methodologies in order to cope with the uncertainty faced by express networks over time.

Jean-Sébastien Tancrez (LSM and CORE, UCLouvain) coordinates this project. **José Miguel Quesada Pérez** (CORE, UCLouvain) works under the scope of this project.

RÉGION WALLONNE (BIDMED PROJECT)

➤ **Application of «Big Data» Digital Technologies in the Healthcare Sector**
(August 2017–July 2020)

BIDMED wishes to explore the applicability and use of "Big Data" digital technologies in the healthcare sector, with a specific objective of enhancing the accessibility to proton therapy, the advanced radiotherapy modality for which the Walloon company IBA is known as the world leader. To this end, IBA will partner with the specialist of medical image management Telemis, as well as the engineering ICTEAM institute from UCL. The consortium is completed by contributions from the operational proton therapy facilities from Sweden.

BIDMED aims at improving the performances and reducing costs associated with proton therapy, at all stages of the equipment lifecycle. At the installation, "machine learning" techniques will be applied to automatize the system calibration. For the equipment maintenance, statistical analysis of the equipment monitoring data as well as predictive analytics will enable predictive interventions and help troubleshooting by a better identification of the root failure causes. During routine operations, the comprehensive analysis of data from multiple workflows will help implementing clinical scenarios with enhanced outcomes either for the patient (adaptive treatments) or for the equipment (rules or guidelines for improved scheduling of the activities in the rooms).

Next to these primary objectives, the project will also enable Telemis to expand their own business, through the procurement of dedicated PACS systems to be integrated with the proton therapy equipment, and by adopting the "smart maintenance" innovations into their monitoring system.

Benoît Macq (ELEN, UCLouvain), **Raphaël Jungers** (INMA, UCLouvain) and **François Glineur** (INMA and CORE, UCLouvain) coordinate this project.

PRIVATE PROJECTS

➤ **Coordination of Transmission and Distribution in Electric Power Systems**
(October 2016–September 2020)

The proliferation of distributed renewable resources at the distribution level, coupled with the presence of significant amounts of load flexibility in the residential and commercial sector, implies that a substantial amount of intelligence will have to be integrated at the distribution level of electric power systems. Moreover, the distribution system operator will need to assume a more active role in the operation of electric power systems and electricity markets, and its interaction with the transmission system operator will need to be clarified. The goal of this research is to model schemes for coordinating TSO-DSO interaction, and to develop scalable optimization algorithms for coordinating the optimal dispatch of transmission and distribution level

resources which can deal with the large scale of the problem and the non-linear representation of power flow at the distribution level.

This project is sponsored by Engie and coordinated by **Anthony Papavasiliou** (CORE, UCLouvain). **Ilyes Mezghani** (CORE, UCLouvain) works under the scope of the project.

➤ **Modeling Flexibility at Sub-Hourly Time Scales**
(February 2016-October 2020)

The large-scale integration of renewable energy sources is creating increasing needs for flexibility. The optimal dispatch of conventional resources at a sub-hourly time scale in order to prevent binding ramping constraints is increasing the challenges of short-term operations. This project aims at developing optimization models and algorithms that can support the optimal utilization of generator flexibility in short-term operations.

This project is financed by Electrabel and coordinated by **Anthony Papavasiliou** (CORE, UCLouvain).

PUBLIC PROJECTS

➤ **PRESupply Research Project**
(December 2016-December 2020)

This project proposes to facilitate access to advanced data analytics to SME's for supply chain management and optimization via the development of a flexible and modular platform. The PRESupply platform aims to increase the value of decisions that affects several parts of the supply chain using an integrated and predictive approach.

Philippe Chevalier (CORE, UCLouvain) and **Isabelle Thomas** (CORE, UCLouvain) are the promoters of this project financed by Logistics in Wallonia (Walloon competitiveness cluster dedicated to transport, logistics and mobility). N-Side is partner of this project. **Henry Dehaybe** (CORE, UCLouvain) works under the scope of the project.

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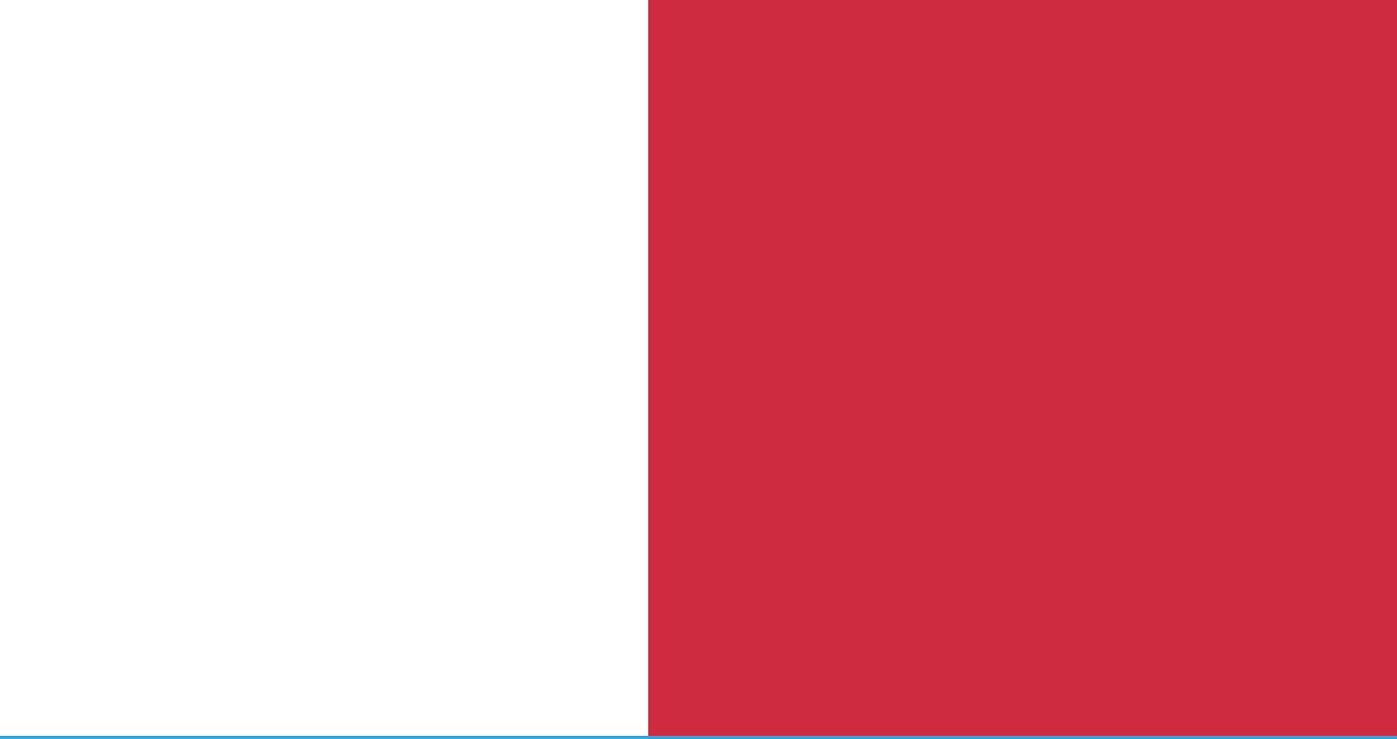
STATISTICS

STATISTICS

For the first 50 years of CORE, statistics are collected by 10 years. As of 2016-2017, they are presented annually.

All details can be found on the CORE webpage (<https://uclouvain.be/en/research-institutes/immaq/core>)

Year	Discussion Papers	Books	Reprints	PhDs	Seminars			Conferences	Research projects
					Economics	Operations Research	Econometrics		
1966-1976	320	6	244	25	275	156	196		40
1976-1986	472	14	449	25	485	247	212	23	57
1986-1996	621	49	518	56	846	256	267	45	138
1996-2006	817	42	657	65	920	229	217	50	143
2006-2016	757	44	941	70	714	274	286	93	316
2016-2017	43	4	94	4	49	16	20	10	43
2017-2018	44	4	78	8	43	17	6	9	45
2018-2019	17	7	77	7	39	19	6	11	46
Total	3091	170	3058	260	3371	1214	1210	241	828

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Louvain Institute of Data Analysis and Modeling in economics and statistics
Center for Operations Research and Econometrics

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