LAUNCH OF IRISK, THE IÉSEG RISK RESEARCH CENTER

> PART I (SCIENTIFIC) - Decision-making under risk and uncertainty

> PART II (OPEN TO THE PUBLIC) - Inspiring Conference: «Making decisions in an uncertain world»

IRISK — IÉSEG RESEARCH CENTER ON RISK AND UNCERTAINTY

IÉSEG SCHOOL OF MANAGEMENT

LEM LILLE ECONOMICS MANAGEMENT

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iRisk Workshop on decision-making under risk and uncertainty

7-8 July 2022 – IÉSEG School of Management, Lille, France

organized in honor of Prof. Louis EECKHOUDT

<u>Organization Committee</u>: <u>Loïc BERGER</u>, <u>Ilke AYDOGAN</u>, <u>David CRAINICH</u>, <u>Thomas EPPER</u>, <u>Uyanga TURMUNKH</u>
<u>Logistics</u>: <u>Céline LE SUÜN</u>

Background and objectives

Uncertainty is pervasive and plays a major role in decision-making. Whether agents pursuing individual goals, or policymakers pursuing social objectives, decision-makers rarely know what the relevant states of the world are. A proper understanding of individual behavior in the face of uncertainty is of great importance for the construction of realistic economic models capable of making accurate predictions, as well as for prescriptive applications guiding decision-making processes.

To celebrate the launch of iRisk, its new research center, IÉSEG School of Management will hold a multidisciplinary workshop on decision-making under risk and uncertainty. Because the creation of the iRisk center would not have been possible without Professor Louis Eeckhoudt, **this workshop is also a unique occasion to celebrate Louis' career and contributions to decision theory and the economics of risk**.

The workshop will gather industry, policymakers, and academic participants and promote dialogs between theory, experimental findings, and applications (in the sense of actual decision-making or the construction of theoretical or empirical models in the social sciences).

Specifically, the workshop will bring together experts from various disciplines covering different aspects of uncertainty modeling and quantification. Ultimately, the workshop intends to:

- Bridge the gap between the theory and practice of decision research and provide an opportunity to discuss challenges faced by practitioners in addressing decision-making under risk and uncertainty
- Discuss the latest developments and practical applications in a variety of different fields
- Identify how perception and biases influence individual and collective decision-making processes and effective solutions for overcoming them
- Identify gaps in the literature that require further research or missing methods and tools for practical applications and opportunities for addressing these gaps
- Build interdisciplinary collaborations on complex decision-making challenges, both within different research fields and between research and practice

All invited talks will be given by leading experts in their respective fields. Theoretical talks will provide new theoretical models focusing on a real-world application and/or on how to make these models relevant in the real world. Fields of practical applications and real-world examples of decision-making include climate change, health, data science, finance, psychology, artificial intelligence, and economics, among others.

PROGRAM

Part I (Academic)
Thursday, July 7, 2022 – room E114

12.30   Registration

13.00   Welcome Address: Jean-Philippe AMMEUX (Dean of IÉSEG School of Management)
Setting the scene: Loïc BERGER (Director of Irisk)

Session 1: Foundations and elicitation (Chair: Ilke Aydogan)

13.10   Massimo MARINACCI (Bocconi University), *Modelling misspecification*
13.40   Ilke AYDOGAN (IÉSEG School of Management), *Experiments on reduction of compound lotteries with objective and subjective probabilities*
14.10   Sebastian EBERT (Frankfurt School of Finance and Management), *On Taking a Skewed Risk More than Once*
14.40   Peter WAKKER (Erasmus University Rotterdam), *A Critical Discussion of Popular Ambiguity Models*

15.10   Coffee Break

Session 2: Climate Change (Chair: Loïc Berger)

15.40   Lars Peter HANSEN (University of Chicago), *How Should Climate Change Uncertainty Impact Social Valuation and Policy?*
16.25   Sara LE ROUX (Oxford Brookes Business School), *Climate Change Catastrophes and Insuring Decisions: A Study in the Presence of Ambiguity*
16.50   Loïc BERGER (CNRS, IÉSEG School of Management), *Are Policymakers Ambiguity Averse?*

Panel discussion: On the rationality of uncertainty aversion
17.15   Panelists: Itzhak GILBOA (HEC Paris), Mohammed ABDELLAOUI (CNRS, HEC Paris), André DE PALMA (Cergy Paris University)

18.15   Social aperitif and tribute to Louis Eeckhoudt by David CRAINICH (CNRS, IÉSEG School of Management)

19.30   *Conference dinner (by invitation)*

8.30   Welcome Coffee

Session 3: Health and Insurance (Chair: Thomas Epper)

9.00   Han BLEICHRODT (University of Alicante), *Incentives in health utility measurement do not matter*
9.30   Thomas EPPER (CNRS, IÉSEG School of Management), *Risk Taking, Time Discounting, and Variations in Household Risk*
10.00   Matteo GALIZZI (London School of Economics), *Risk and social preferences predict risky sexual behaviour amongst youth in Zimbabwe*

10.30   Coffee Break

Session 4: Behavioral Aspects of Uncertainty (Chair: Uyanga Turmunkh)

10.50   Olivier L'HARIDON (University of Rennes), *Loss aversion is robust*
11.20   Uyanga TURMUNKH (IÉSEG School of Management), *Ambiguity in Voting*
11.50   Songfa ZHONG (National University of Singapore), *Narrowly Rational*

End of Part I

Part II (open to the public): Decision-making under uncertainty in practice
Friday, July 8, 2022 – room B050

12.30   Lunch (optional)

13.30-13.35   Welcome address: Inspring Conferences (Caroline Roussel, Dean of IÉSEG School of Management)

13.35-14.45   Roundtable: Making decisions in an uncertain world [room B050]

Panelists:

Mathias DEWATRIPONT is a distinguished, and broad, economic theorist. He has been instrumental in the development of contract theory, and its applications to a large variety of topics. Mathias holds a Ph.D. in Economics from Harvard University (1986). Since 1990, he has been Professor of Economics at Université libre de Bruxelles. Fellow of the Econometric Society, he was President of the European Economic Association in 2005 and was a founding member of the Scientific Council of the ERC. He is member of the Académie Royale De Belgique and Foreign Honorary Member of the American Academy of Arts and Science. Mathias was also Executive Director of the National Bank of Belgium between 2011 and 2017, being its representative on the Basel Committee on Banking Supervision and on the Supervisory Board of the European Central Bank. During these last two years, Mathias was also a member of different management and exit strategy expert groups, responsible for monitoring the evolution of the COVID-19 epidemic and providing opinion on the Belgian government's strategy. Mathias has published widely in the areas of contract theory, organisation economics, and banking and finance.

Christian GOLLIER is Professor of Economics at the Toulouse School of Economics and an internationally renowned researcher in decision theory under uncertainty and its applications in climate economics, finance, and cost-benefit analysis. He holds a Ph.D. in economics from Catholic University of Louvain. He is fellow of the Econometric Society and won the Paul Samuelson Award for his 2001 MIT book "The Economics of Risk and Time". With Jean Tirole, he created the Toulouse School of Economics, where he serves as director (2007-2015 and 2017-). Christian is also one of the authors of the 4th and 5th reports of the Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Peace Prize in 2007. In addition, he regularly advises several governments on their public investment evaluation policies. In 2020, Christian was asked to lead the climate change component of the Commission of Experts on the Great Economic Challenges set up by President Macron. The work of the commission led to the production of a detailed report drawing recommendations to make economic policies more effective in responding to three long-term structural challenges. Christian's recent book for the general public, "Le Climat après la fin du mois" (PUF 2019), deals with the importance of taking action in the face of climate change and has been a great success in France.

Gilles MOËC is the AXA Group Chief Economist and AXA IM Head of Research since June 2019. He also oversees Responsible Investment activities pertaining to research, thought leadership, engagement and active ownership since September 2020. Gilles graduated from Institut d'Etudes Politiques de Paris in 1991. Between 1994 and 2006, he held several positions in the French civil service, at the national statistical institute (INSEE) and at the central bank notably as head of the International Economics Division of Banque de France. In 2006, he was appointed Senior European Economist at Bank of America then became, in 2009, Chief European economist of Deutsche Bank. Then, from 2014 to 2019, he has been Chief European Economist at Bank of America Merrill Lynch.

Vicky POLLARD (TBC) is acting head of unit and deputy head of unit "Foresight, Economic Analysis & Modelling" at the DG Climate Action of the European Commission since September 2019. Previously, she was the Environment and Climate Counsellor of EU delegation to China and Mongolia. She has worked on climate change for the Commission since 2006, covering international negotiations, relations with the US and other OECD countries and domestic policy. Before 2014, she was Deputy head of unit for the implementation of the EU ETS. She joined the European Commission in 2004 and worked on the EU Lisbon Strategy and the review of the EU Sustainable development strategy. Prior to this, she worked on environmental policy and economics, as a consultant, as Chief executive of the European Wind Energy Association and as economist in the UK government and Environment Agency.

Moderator

Thibault LIEURADE Head of the section Economics + Business at The Conversation France. A graduate of ESCP Europe and Grenoble Ecole de Management, Thibault Lieurade is a journalist and editorial consultant specializing in economics and management. Before joining The Conversation, he worked in several national newsrooms, including France 24, as well as for the web TV Xerfi Canal.

End of Part II

ABSTRACTS

Ilke AYDOGAN (IÉSEG School of Management): *Experiments on reduction of compound lotteries with objective and subjective probabilities*

The reduction principle underlies some modern theories of decision making under ambiguity and is crucial for the applications of those theories with prescriptive purposes. We examine preferences over compound sources of uncertainty that require reduction with objective and subjective probabilities. Our investigation sheds light on the nature of those preferences in three important ways. We provide (1) a comprehensive analysis of attitudes (aversion & likelihood insensitivity) towards such sources by using the rigorous matching probability design, (2) an additional analysis of subjective beliefs elicited by using proper scoring rules with Bayesian truth serum, and (3) a comparison of the preferences of risk professionals with those of a convenience sample of students to understand the potential role of sophistication.

Loïc BERGER (CNRS, IÉSEG School of Management): *Are Policymakers Ambiguity Averse?*

We investigate the ambiguity preferences of a unique sample of real-life policymakers at the Paris UN climate conference (COP21). We find that policymakers are generally ambiguity averse. Using a simple design, we are moreover able to show that these preferences are not necessarily due to an irrational behaviour, but rather to intrinsic preferences over unknown probabilities. Exploring the heterogeneity within our sample, we also show that the country of origin and the degree of quantitative sophistication affect policymakers' attitudes towards compound risk, but not towards ambiguity. Robustness results are obtained in a lab experiment with a sample of university students.

Sebastian EBERT (Frankfurt School of Finance and Management): *On Taking a Skewed Risk More than Once*

This paper collects results on the repeated risk-taking of skewed risks. An extensive body of theoretical and experimental literature has shown that, in one-time decision situations, humans are skewness-seeking and dislike risks that feature unlikely but large losses (i.e., negatively skewed risks). We show that, contrary to intuition, the often-observed phenomenon of penny-picking—repeatedly taking negatively skewed risks—is not at odds with skewness-seeking, but, to the contrary, may even be caused by it. The skewness of the distribution that results from repeatedly taking a skewed risk depends in non-trivial ways on the risk-taking strategy and may even differ in sign from that of the individual risk. With sufficient time available, every risk—no matter how negatively skewed—can be gambled in such a way that, in total, skewness is positive. Because recent work has shown that skewness is decisive whether risk is taken, this result may be important for economics and finance on a fundamental level.

Thomas EPPER (CNRS, IÉSEG School of Management): **Risk Taking, Time Discounting, and Variations in Household Risk**

We study decision-making under risk and over time in a field experiment with maize farmers in Uganda. A fundamental part of the risk borne by households in our sample stem from their farming investments, with households facing substantial income shortfalls in the event of harvest failure. Using a randomized controlled trial, we distribute free index insurance to half of our farmers, thereby reducing their households' risk exposure fundamentally. We investigate how this reduction of household risk affects farmers' risk taking and time

discounting decisions in separate decision-making tasks and investigate how risks and the dated outcomes are integrated with household risks and income flows. Lastly, we test the interaction of risk and time preferences according to theories postulating that these two preference domains are closely intertwined. We explore whether variations in household risk affect the link between risk and time preferences.

Matteo GALIZZI (London School of Economics): **Risk and social preferences predict risky sexual behaviour amongst youth in Zimbabwe**

Young people in sub-Saharan Africa are particularly at high risk of Human Immunodeficiency Virus (HIV) and other sexually transmitted infections such as Herpes-Simplex Virus type 2 (HSV-2). Using data from economic experiments conducted amongst 1,568 persons aged 15-29 years in Zimbabwe, we document the association between risk aversion, altruism, present-bias and future-bias at baseline and HSV-2 status and number of sexual partners measured 12 months later. Women measured to be more altruistic at baseline were more likely to be HSV-2 positive 12 months later. Men measured to be risk averse at baseline were less likely to be HSV-2 positive at follow-up. We find limited association of preferences with number of sexual partners. Results highlight gender differences in the influence of preferences on HIV risk behaviours and potential for future research to design targeted interventions based on preferences.

Lars Peter HANSEN (University of Chicago), **How Should Climate Change Uncertainty Impact Social Valuation and Policy?**

We develop and apply methods for confirming uncertainty and its impacts, broadly speaking, for the design and conduct of public policy. This research brings tools from decision theory and asset pricing to study uncertainty evaluation including the particular ramifications for the social cost of carbon.

Olivier L'HARIDON (University of Rennes): **Loss aversion is robust**

Several papers have challenged the robustness of loss aversion, claiming that it is context-dependent and disappears for choices with small stakes. We show that these findings may have been confounded by diminishing sensitivity and probability/event weighting and perform a new test that controls for these confounds. In a choice-based task, we found significant loss aversion for both small stakes and high stakes. The overall loss aversion coefficient varied between 1.25 and 1.45, less than commonly observed. Loss aversion decreased slightly for small stakes, but the effect was small and usually insignificant. Overall, the results indicate that loss aversion is robust although not as strong as previous studies suggest, and that stake size has little effect on it.

Sara LE ROUX (Oxford Brookes Business School): **Climate Change Catastrophes and Insuring Decisions: A Study in the Presence of Ambiguity**

There has been very little research to test whether ambiguity affects individuals' decisions to insure themselves against the catastrophic effects of climate change. This paper attempts to study how individuals respond to the availability of an insurance that would safeguard their interests if a climate change catastrophe occurred. If such an insurance is available to them, do individuals insure themselves sufficiently? Further, the study investigates if information regarding the past occurrence of the catastrophic event leads to an increase in insurance subscriptions and/or the emergence of a lemons market. Finally, policy implications are investigated - Can an indirect intervention in the form of a "nudge" ensure a better outcome?

Massimo MARINACCI (Bocconi University): **Modelling misspecification**

We discuss models of rational decision-making that account for model misspecification concerns.

Uyanga TURMUNKH (IÉSEG School of Management): **Ambiguity in Voting**

Riker and Ordershook (1968) proposed that a key parameter that influences a citizen's decision to vote is her perception of the closeness of the votes to be received by the frontrunner and the runner-up in the election. Thus, they argued that election turnout can be explained by people's (subjective) beliefs about the pivotality of the results. To date, however, direct tests of the determinants of voting behavior have found little support for the influence of beliefs, finding instead that voting behavior is mostly driven by factors other than beliefs, such as the perceived levels of importance that people attach to the election outcomes, the costs of voting, and people's sense of civic duty (e.g., Gerber et al. 2020; Blais et al. 2000). This is puzzling, because presumably the importance that people attach to the election outcomes ought to be moderated by whether (or not) they consider their own votes to have any impact on bringing about those outcomes in the first place. In this paper, we hypothesize that beliefs about closeness, like most beliefs about real-world events, cannot easily be probabilized. Ambiguity (unknown probabilities) plays a role. The role of ambiguity in voting behavior has not been studied in the literature to date. Prior papers mostly assumed the traditional Expected Utility model, with no possibility for studying the role played by ambiguity.

Peter WAKKER (Erasmus University Rotterdam): **A Critical Discussion of Popular Ambiguity Models**

This lecture discusses the currently most popular ambiguity models, with pros and cons from a normative and descriptive perspective. It aims to be more of a group discussion than lecture, where the audience is invited to express their opinions.

Songfa ZHONG (National University of Singapore): **Narrowly Rational**

The revealed preference analysis allows the inference of underlying preferences from observable choices, and numerous studies have shown that choice data are generally rationalizable by some utility function for the given settings. This study examines whether choice data can be rationalized across settings. In an experiment, we compare portfolio allocations in one setting between two equiprobable Arrow securities, and in another setting between one risk-free asset and one with risky asset that delivers either positive return or nothing with equal probability. We show that choice data is rationalizable within settings, but inconsistency is pervasive across settings. We further show that some heuristic rules may underpin the rationalizability of choice behaviour. Our study contributes to the literature on revealed preference analysis, rule-based decision making, and the nature of risk preferences.

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IRISK: IÉSEG RESEARCH CENTER ON RISK AND UNCERTAINTY

> IRisk is part of the IÉSEG School of Management and seeks to be interdisciplinary in its activities. It is also integrated within the LEM (Lille Economics and Management), a Research Unit of the CNRS (National Centre for Scientific Research).

IRISK: TO SUPPORT RESEARCH ACTIVITIES IN THE FIELD OF DECISION-MAKING UNDER RISK AND UNCERTAINTY

OUR MISSION

iRisk works to better understand and improve decisions about environmental, health, wealth, and other risks through impartial economic research.

ECONOMICS

Our researchers are specialists of the economics of risk and uncertainty.

ENVIRONMENT

From climate policy to a wider range of environmental and societal issues, we are addressing some of the most important challenges of our day.

HEALTH

We examine how risk management tools can be used to improve public health.

INSURANCE

We study the sources of over- and under-insurance, and how insurance products can be designed to improve welfare.

DEVELOPMENT

We aim to better understand subsistence farmers' household decisions with the goal to develop policies that enhance their families' life situation.

EUROPE

We are a central focal point for research insights on risk and uncertainty in Europe, with an international network of experts and stakeholders.

OUR NUMBERS - 2021*

2.5M€
The members of iRisk have acquired more than 2.5 millions Euros of funding as principal investigators or co-investigators.

11
We are an interdisciplinary research group with 11 researchers from different fields and institutions.
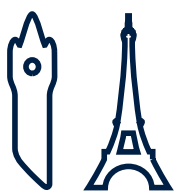
6 NATIONALITIES
We are a diversified team with people coming from 6 different countries.

9
We have 9 ongoing projects funded by ANR, *Hauts-de-France* region, Lille European Metropolis, IDEX/I-SITE, Swiss National Science Foundation, Research Foundation Flanders.

2
We are located on two campuses: our original campus in the young and dynamic city of Lille, at the crossroads of London, Brussels, Amsterdam, and Paris; and our Paris Campus in the vibrant and bustling business hub of La Défense.

24
We have published 24 articles in leading journals (*Nature, PNAS, American Economic Review, Economic Journal, Management Science, Operations Research, …*) since 2020.

* Established on January 1st, 2020

OUR RESEARCH

The research developed at iRisk ranges from theoretical contributions on risk and uncertainty to applications discussing policy issues, such as savings, insurance, portfolio choice, climate, and health.

■ **BEHAVIORAL SCIENCE**

We use state-of-the-art behavioral techniques to understand individuals' perception of, and reaction to, uncertainty. We assess the behavioral elements that affect individuals' and institutions' choices. We evaluate public and private programmes, both in developed and developing countries, through various types of experiments.

■ **UNCERTAINTY AND CLIMATE CHANGE**

We study new ways of incorporating preferences people have with respect to uncertainty in the decision-making processes related to climate policy. We extend the theoretical and methodological advances in behavioral economics to decision-making in the environmental domain. We study the behavioral determinants of individuals' support of or opposition to environmental and climate policy. Ultimately, our aim is to provide new insights on the best ways to motivate climate action.

■ **INTERACTIONS BETWEEN UNCERTAINTY, TIME AND SOCIAL PREFERENCES**

Future consequences are uncertain by nature. Similarly, most social decisions come with uncertainty about the other people's actions or trustworthiness. We study whether and how economic preferences interact across choice domains using both theoretical and empirical methods.

■ **INSURANCE**

We study the demand for insurance and, in particular, why people are reluctant to purchase insurance in some domains (e.g., in the health domain), but pay exorbitant premia in other domains (e.g. for extended warranties). Our research investigates the behavioral factors of insurance demand in both developed and developing countries.

OUR METHODS
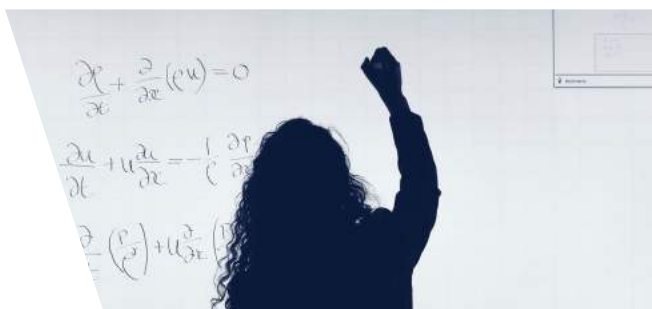
THEORY

EXPERIMENTAL AND BEHAVIORAL ECONOMICS

FIELD EXPERIMENTS AND LINKING REAL-WORLD DATA TO EXPERIMENTAL MEASURES

ECONOMETRICS AND DATA SCIENCE

OUR MAIN INSTITUTIONAL PARTNERS

iRisk's research activities are integrated within the LEM (Lille Economics and Management) research unit which comprises IÉSEG School of Management, the CNRS (National Centre for Scientific Research) and the University of Lille.

Founded in 1964, **IÉSEG** is a freestanding business school and a fully independent nonprofit organisation. As a Grande École, IÉSEG is part of an elite group of international business schools that hold the "triple crown" of international accreditations (AMBA, AACSB, EQUIS).

The **French National Centre for Scientific Research** is among the world's leading research institutions. Internationally recognised for the excellence of its scientific research, the CNRS is a reference in the world of research and development, as well as for the general public.

With almost 75,000 students, the **University of Lille** is one of the largest French universities. It is also a dynamic institution connected with some of the top-ranked foreign universities in the world.

■ SCIENTIFIC ORGANIZATIONS AND NETWORKS

iRisk has developed strong links with researchers from other leading institutions. iRisk members also belong to various scientific organizations and networks.

Bocconi is among the leading European universities specialized in the Social Sciences

HEC Paris is a leader in research and education in management sciences, recognized for the quality of its research.

The **Erasmus School of Economics** is an internationally renowned institute that contributes to advanced scientific knowledge on major economic issues.

Institute leveraging two leading international centers for economic and environmental research: **Resources for the Future (RFF)** and **Euro-Mediterranean Center on Climate Change (CMCC)**. Its mission is to improve environmental, energy, and natural resource decisions through economic research and policy engagement.

Scientific lab based at **Ghent University** that investigates decision-making processes under risk and over time, conducting both scientific research and providing advise and consultancy services to policy makers, nongovernmental organisations, and companies.

International scientific association born to contribute to the development of environmental, climate and resource economics and to encourage cooperation in European countries.

European based non-profit organisation dedicated to promoting research on risk and insurance through the organisation of scientific conferences and meetings, the publication of research materials and the creation of a contact network amongst the concerned parties.

OUR HUMAN CAPITAL
IRISK CORE TEAM

Loïc BERGER

Director of iRisk
Research Professor in
Economics, CNRS, IÉSEG

Interests: Decision-
making under risk and
uncertainty; Climate
change economics

Expertise: Belief and
preference elicitation under
uncertainty, evaluation of
public policies

Ilke AYDOGAN

Assistant Professor in
Economics, IÉSEG

Interests: Behavioral and
experimental economics;
judgment and decision
making under risk and
uncertainty

Expertise: Non-expected
utility theories; experimental
elicitation of subjective
beliefs and preferences
under risk and ambiguity

David CRAINICH

Researcher in Economics,
CNRS, IÉSEG

Interests: Risk theory;
Health economics

Expertise: Higher order
risk preferences; effect
of genetic information
on prevention actions,
financial incentives for
health behavior change

Louis EECKHOUDT

Emeritus Professor in
Economics, IÉSEG

Interests: Decision-making
under risk

Expertise: Expected utility
theory

Thomas EPPER

Research Professor in Economics, CNRS, IÉSEG

Interests: Decision-making under risk and uncertainty, intertemporal choice, inequality and redistribution

Expertise: Modelling economic decision-making, preference and belief elicitation, applications to insurance, household and policy decisions

Uyanga TURMUNKH

Assistant Professor in Economics, IÉSEG

Interests: Judgment and decision-making, risk and ambiguity, environment, cooperation, behavioral interventions

Expertise: Theories of decision-making, experimental and survey methods, environmental behavior

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