Lorenzo Maria Stanca

Last updated 23rd February, 2024

Contact Information

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Citizenship: Italian
Date of Birth: 21st of April, 1992

Fields

Research: Microeconomic Theory, Decision Theory, Game Theory.

Academic Positions

Assistant Professor of Economics, Collegio Carlo Alberto — September 2022-
Research Fellow, ESOMAS Department, University of Turin — September 2022-
Associate Researcher at ETH Zurich,
Chair of Integrative Risk Management and Economics — May 2023-

Education

Ph.D., Managerial Economics and Strategy, Northwestern University — 2022
Dissertation: *Essays on Decision Theory*
Committee: Peter Klibanoff (Co-Chair), Marciano Siniscalchi (Co-Chair), Nabil Al-Najjar, Daniel Martin.

M.S., Mangerial Economics, and Strategy, Northwestern University — 2017

M.S., Economics, Bocconi University, — 2016
Advisor: Pierpaolo Battigalli.

B.S., Economics, Bocconi University, — 2014.
Advisor: Massimo Marinacci.

Teaching Experience

Assistant Professor, Collegio Carlo Alberto and University of Turin — year 2022-
Economic Principles (intermediate microeconomics), 2023-.
SEM0158, Microeconomics, 2023.

Teaching Assistant, Northwestern University — year 2017-2022
MECS 560-2, Dynamic Optimization in Economics.
DECS 430-0, Business Analytics.
DECS 452-0, Game Theory and Strategic Decision Making.

Awards and Recognitions

Top-up Foscolo Europe Fellowship, UniCredit Foundation, 2022-2025.

Eligible as Associate Professor of Economics (13/A1, Economia Politica) according to the 2023-2034 Italian Scientific Eligibility System.

Refereeing

Econometrica, *American Economic Review*, *Journal of Economic Theory*, *Theoretical Economics*, *Economic Theory*, *Journal of Mathematical Economics*, *Mathematics of Operation Research*, *Decisions in Economics and Finance*, *Mathematics and Financial Economics*.

Publications

"Robust Bayesian Choice"
Mathematical Social Sciences, 126 (2023): 94-106.

Brief abstract: A major concern with Bayesian decision making under uncertainty is the use of a single probability measure to quantify all relevant uncertainty. This paper studies prior robustness as a form of continuity of the value of a decision problem. I show that this notion of robustness is characterized by a form of stable choice over a sequence of perturbed decision problems, in which the available acts are perturbed in a precise fashion. I then

introduce a choice-based measure of prior robustness and apply it to models of climate mitigation and portfolio choice.

"Foundations of ambiguity models under symmetry: α-MEU and smooth ambiguity" with Peter Klibanoff, Sujoy Mukerji and Kyoungwon Seo.

Journal of Economic Theory, 199 (2022): 105202. Special issue on Ambiguity and Robustness.

Abstract: The α-MEU model and the smooth ambiguity model are two popular models in decision making under ambiguity. However, the axiomatic foundations of these two models are not completely understood. We provide axiomatic foundations of these models in a symmetric setting with a product state space S^∞. This setting allows marginals over S to be linked behaviorally with (limiting frequency) events. Bets on such events are shown to reveal the i.i.d. measures that are relevant for the decision maker's preferences and appear in the representations. By characterizing both models within a common framework, it becomes possible to better compare and relate them.

"Smooth aggregation of Bayesian experts"

Journal of Economic Theory, 196 (2021): 105308.

Abstract: I study the ex-ante aggregation of preferences of Bayesian agents in a purely subjective framework. I relax the assumption of a Bayesian social preference while keeping the Pareto condition. Under a simple axiom that relates society's preference to those of the agents, I obtain an additively separable representation of society's preference. Adding an ambiguity aversion axiom I obtain a representation that resembles the Smooth Ambiguity Criterion of Klibanoff et al. (2005). I then briefly consider applications of this framework to inequality and treatment choice under ambiguity.

"A simplified approach to subjective expected utility."

Journal of Mathematical Economics, 87 (2020): 151-160.

Abstract: I provide a novel simplified approach to Savage's theory of subjective expected utility. Such an approach is based on abstract integral representation theorems in the space of measurable functions. The advantage of such an approach is that these results can be used to easily obtain variations on Savage's theorem, such as representations with state-dependent utility or probability measures that can have atoms. Finally, I discuss how such an approach can be used in other settings such as decision making under ambiguity.

Working papers

"Recursive Preferences, Correlation Aversion, and the Temporal Resolution of Uncertainty."

Abstract: This paper investigates a behavioral feature of recursive preferences: aversion to risks that are persistent through time. I introduce a formal notion of correlation aversion to capture this phenomenon and show that increasing relative risk aversion (IRRA) is equivalent to correlation aversion. I further show that IRRA constrains preferences for early resolution of uncertainty. However, I demonstrate that common models of recursive preferences such as Epstein-Zin cannot distinguish risk aversion from correlation aversion and preferences for early resolution of uncertainty, leading to empirical issues in asset pricing. I propose a generalization of the Epstein-Zin model that can accommodate such difficulties. Finally, I show that correlation averse preferences admit a variational representation, which connects correlation aversion to fear of model misspecification.

"Restricted Dynamic Consistency"

Abstract: Dynamic consistency is a key behavioral property in dynamic models, enabling tractability by means of dynamic programming methods. However, it is a behavioral property that is often violated in experiments. This paper shows that dynamic consistency can be relaxed to hold over a much smaller domain of consumption programs. Nonetheless, this domain can still be sufficiently rich for practical applications. To illustrate, I provide examples of domains that are rich enough to separate risk aversion from intertemporal substitution. As an application, I introduce a new model of dynamic preferences, the Epstein- Zin-Selden-Stux preferences. These preferences are recursive only within a restricted domain. In contrast with standard recursive preferences, this weaker notion of dynamic consistency allows for indifference to the timing of resolution of uncertainty.

"Recursive Preferences and Ambiguity Attitudes" with Massimo Marinacci and Giulio Principi.

Abstract: We illustrate the strong implications of recursivity, a standard assumption in dynamic environments, on attitudes toward uncertainty. We show that in intertemporal consumption choice problems, recursivity always implies constant absolute ambiguity aversion (CAAA) when applying the standard dynamic extension of monotonicity. Our analysis yields a functional equation called "generalized rectangularity," as it generalizes the standard notion of rectangularity for recursive multiple priors. Our results highlight that if uncertainty aversion is modeled as a form of convexity, recursivity limits us to recursive variational preferences. We propose a novel notion of monotonicity that enables us to overcome this limitation.

"Affine Gateaux Differentials and the von Mises Statistical Calculus" with Simone Cerreia-Vioglio, Fabio Maccheroni, Massimo Marinacci, and Luigi Montrucchio.

Abstract: This paper presents a general theory of one-dimensional differentiability for functionals having convex domains which are not necessarily open. The local approximation is carried out by an affine functions, rather than a linear one as in the standard Gateaux derivative. These derivatives have many applications but their theoretical properties are underexplored in literature. We also analyze variations such the affine counterpart of the classical Hadamard and Frechet derivatives. Applications to Statistics and Economics are also discussed.

"Optimal consumption and investment under relative performance criteria with Epstein-Zin utility" with Jodi Dianetti and Frank Riedel.

Abstract: We consider the strategic interaction of traders in a continuous-time financial market with Epstein-Zin-type recursive intertemporal preferences and performance concerns. We derive explicitly an equilibrium for the finite player and the mean-field version of the game, based on a study of geometric backward stochastic differential equations of Bernoulli type that describe the best replies of traders. Our results show that Epstein-Zin preferences can lead to substantially different equilibrium behavior.

"A Nonlinear Sandwich Theorem" with Giulio Principi and Mario Ghossoub.

Abstract: We provide a Sandwich Theorem (König (1972)) for positively homogeneous functionals that satisfy additivity only on a restricted domain. Our relaxation of additivity is based on a binary relation called convex-conic symmetric preorder, whereby additivity is restricted to all couples of elements that belong to such relation. We then study applications of our nonlinear Sandwich Theorem, proving extension and envelope representation results. Finally, we consider some applications to comonotonicity, a key property in decision theory, risk measurement, and the theory of risk sharing.

Work in Progress

"Arbitrage Pricing in Convex, Cash-Additive Markets" Emy Lécuyer and Frank Riedel.

Abstract: We consider superhedging and no-arbitrage pricing in markets with a convex and cash-additive market structure and derive an explicit functional form for the super-replication price. By convex duality methods, we show that the superhedging price maximizes the difference between the expected payoff and a confidence function that accounts for the reliability of the probability used in the pricing. We show that the existence of a strictly positive probability within the confidence function's domain, maximizing the super-replication price for a specific payoff, and acting as a lower bound for all other payoffs, is necessary and sufficient to prevent arbitrage opportunities. Furthermore, we explore entropy pricing as a significant example of a super-replication pricing functional and present conditions under which the super-replication price adopts the entropy pricing form. We illustrate that the confidence function in entropy pricing can be expressed using the Kullback-Leibler divergence.

"Signed Subjective Expected Utility" with Adam Brandenburger, Paolo Ghirardato and Daniele Pennesi.

Abstract: In the world of subjective probability, there is no a priori reason why probabilities—interpreted as a willingness-to-bet—should necessarily lie in the interval $[0, 1]$.

We weaken the Monotonicity axiom in classical subjective expected utility (Anscombe and Aumann, 1963) to obtain a representation of preferences in terms of an affine utility function and a signed (subjective) probability measure on states. We decompose this probability measure into a non-negative probability measure ("probability") and an additive set function on states which sums to 0 ("valence"). States with positive (resp. negative) valence are attractive (resp. aversive) for the decision maker. We show how our decision theory can resolve the paradoxes of the conjunction effect (Tversky and Kahneman, 1982, 1983), the co-existence of insurance and betting (Friedman and Savage, 1948), and the choice of dominated strategies in strategy-proof mechanisms (Hassidim et al., 2016). We also comment on the possible application of our theory to signed-probability representations of quantum mechanics (originating in Wigner, 1932).

"Ambiguity Attitudes" with Francesco Fabbri and Giulio Principi.

Abstract: We represent preferences that exhibit absolute or relative attitudes towards ambigu- ity without presuming convexity (Schmeidler, 1989). These assumptions are in line with the experimental evidence by Baillon and Placido (2011b, 2019), which indicates that (i) individuals tend to become less averse to ambiguity as their financial status improves, and (ii) aversion to ambiguity does not necessarily entail convex prefer- ences. Our representation admits a similar optimism-pessimism representation as that in Chandrasekher, Frick, and Iijima (2022). We provide a novel interpretation of this representation which illustrates a connection with moral hazard. Finally, we introduce a novel parametric specification based on a generalization of the smooth ambiguity model of Klibanoff et al. (2005).

"Strategic Ambiguity, Moral Hazard, and the Optimal Deterrence Strategy" with Michael Porcellacchia.

Abstract: Over the last 50 years, the US has given security promises to many nations while maintaining strategic ambiguity, notably towards Taiwan. This approach involves deciding on protection against other rival pwoers, like China. Neutrality can lead to aggression, but clear protection might cause moral hazard, such as reduced defense efforts by the smaller nation. Our model shows that strategic ambiguity, defined as Knightian uncertainty, deters aggression and prevents moral hazard. We also demonstrate that when the rival nation matches the great power's strength, the latter fully commits to defending the smaller nation, preventing allegiance shifts. This explains the US's move from ambiguity to clarity.

"Survival Ambiguity" with Antoine Bommier and François Le Grand.

Abstract: Intertemporal preferences are crucial in economic interactions. Previous research has shown that in expected utility models, uncertainty about lifespan (mortality risk) has the same impact on time discounting as pure time preference. This paper presents evidence that significant differences arise when standard assumptions about mortality in expected utility models are relaxed. We show that allowing for ambiguity about survival probability expands the class of admissible preferences that are indifferent to timing. We also introduce a new special case for such preferences, called "robust disounting," which can be seen as a generalization of multiplier preferences.

"Deliberate randomization and preference for correlation" with Xiaoyu Cheng.

Extended abstract: We revisit the literature on stochastic choice based on an observation from the existing experimental evidence: A decision-maker (DM) often chooses differently from the same set of alternatives when asked to choose multiple times. The existing literature offers an interpretation that the DM has a convex preference over lotteries, i.e., strictly prefers a non-degenerate probability distribution over the alternatives to any degenerate ones. Because the experiments are often conducted in a dynamic setting, we observe that the subjects' choices also exhibit a form of negative correlation: if an alternative was chosen in the past, it is less likely that it will be chosen today. In other words, it shows a form of intertemporal preference for variety. In order to capture such a preference, we translate the convex preference over lotteries to a convex preference in an intertemporal setting. Specifically, we introduce a dynamic extension of the Cautious Expected Utility model and show that it can generate this pattern of choice. In addition, we aim to show that the converse is true, i.e., any stochastic choice function that exhibits negative correlation over time is the product of the optimization of some dynamic convex preference.

Research Visits

2024 ETH Zurich (Chair of Integrative Risk Management).

2023 ETH Zurich (Chair of Integrative Risk Management and Bielefeld University (Center for Mathematical Economics).

2022 ETH Zurich (Chair of Integrative Risk Management and Economics), Bielefeld University (Center for Mathematical Economics).

Invited Presentations and Conferences

2024 Warwick University—CRETA conference, Bocconi University—Spring Workshop on Economic Theory.

2023 The University of Hong Kong—Science of Decision Making Conference (SDM), Kyoto University—Risk Uncertainty Decision Conference (RUD), Institute Henri Poincaré—D-TEA (Decision: Theory, Experiments, and Applications), University of Paris 1 Pantheon-Sorbonne—Society for the Advancement of Economic Theory Conference (SAET), Università Panthéon-Assas—Time Uncertainties & Strategies IX (TUS), LUISS University—Spring Workshop on Economic Theory.

2022 University Paris 1 Panthéon-Sorbonne, Collegio Carlo Alberto, University of Naples Federico II, Bocconi University, Queen Mary University, IÉSEG School of Management, ETH Zurich, Bielefeld University.

Languages

Italian (native), English (fluent), Spanish (intermediate).

References

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