

## Preface

This volume contains a selection consisting of the best papers presented at the FUR XII conference, held at LUISS in Roma, Italy, in June 2006, organized by John Hey and Daniela Di Cagno. The objectives of the FUR (Foundations of Utility and Risk theory) conferences have always been to bring together leading academics from Economics, Psychology, Statistics, Operations Research, Finance, Applied Mathematics, and other disciplines, to address the issues of decision-making from a genuinely multi-disciplinary point of view. This twelfth conference in the series was no exception. The early FUR conferences – like FUR I (organized by Maurice Allais and Ole Hagen) and FUR III (organized by Bertrand Munier) – initiated the move away from the excessively rigid and descriptively-inadequate modelling of behaviour under risk and uncertainty that was in vogue in conventional economics at that time. More than twenty years later, things have changed fundamentally, and now innovations arising from the FUR conferences, and manifesting themselves in the new behavioural economics, are readily accepted by the profession. Working with new models of ambiguity, and bounded rationality, for example, behavioural decision making is no longer considered a sign of mere non-standard intellectual diversification. FUR XII was organised with this new spirit. In the sense that the behavioural concerns initiated by the first FUR conferences are now part of conventional economics, and the design and organisation of FUR XII reflects this integration, FUR XII represents a key turning point in the FUR conference series.

The 13 papers in this volume represent a sample of the best recent work in normative and descriptive modelling of behaviour under risk and uncertainty. We have divided the 13 papers into four broad parts (although there are obvious overlaps between the various parts): Uncertainty and information modelling; Risk modelling; Experimental individual decision making; and Experimental Interactive decision making.

### **Part I: Uncertainty and Information Modelling**

There are four papers in this section. The one by Ghirardato et al. makes the fundamental claim that dynamic consistency – the fundamental property in dynamic

choice models – is only compelling for choice situations in which acts are not affected by the possible presence of ambiguity. Their approach is based on one of the most general representations of preferences under uncertainty available up to now in the literature. Needless to say, such an approach opens new avenues of research on ambiguity. It also gives an edifying example of the maturity of research on decision making under uncertainty reached when FUR XII was organised.

Cohen et al. are also concerned with dynamic decision making under uncertainty but with exogenously given probabilities; they are interested in the role of risk perception. Their paper is another example of the use of insights from psychology and behavioural decision making in preference modelling.

Using a general framework of conditional preferences under uncertainty in the context of sequential equilibrium and rationalisability (building on earlier work by Asheim and Perea), Asheim shows that a conditional probability system (where each conditional belief is a subjective probability distribution) may lead to a refinement of a preference between two acts when new information – ruling out states at which the two acts coincide – becomes available.

Assuming that individual choice behaviour depends on more than the alternatives the decision maker is objectively facing, Stecher proposes an original axiomatic setup in which agents have preferences on their private subjective conceptions of possible alternatives. Given this axiomatic structure, the author provides conditions under which agents can communicate with others who do not necessarily perceive the world in the same way. The paper concludes that successful coordination needs the communication language between agents (for trade purposes) to be sufficiently vague. This is an important, if counter-intuitive, conclusion.

## **Part II: Risk Modelling**

There are just three papers in this section. The first, one by Borgonovo and Peccati, works within the expected utility framework. They tackle sensitivity analysis as an integral part of any decision making process. Specifically, the authors answer two questions: the first concerning the response of decision making problems to small changes in the input (parameters); and the second relating to the problem of how the change is apportioned to input variations. The answers are important and interesting.

The second paper in the section is by Kaivanto and addresses the question of whether Cumulative Prospect Theory (CPT) resolves the famous St. Petersburg Paradox. Building on Rabin's "law of small numbers" (Rabin 2002), the author shows that the apparent failure of CPT popular parameterizations to resolve the paradox can be explained by the alternation bias inherent to the coin tossing process in the St. Petersburg gamble.

The final paper, one by Fabiyi, raises an interesting issue with respect to the form of the weighting function used in (Cumulative) Prospect Theory and in Rank Dependent Expected Utility function. Empirically it has often been observed to be S-shaped. Fabiyi provides a normative basis for this empirical finding.

### **Part III: Experimental Individual Decision Making**

There are four papers in this section, illustrating the importance of experimental work and the amount of activity in this sector. The first is by Neugebauer who reports on an experiment in which the subject has to allocate his or her investment capital towards three assets. The experimental results confirm two main findings in behavioural decision making and behavioural finance – that is, first, that most subjects choose a dominated lottery when dominance is not transparent and, second, that subjects are loss-averse rather than variance-averse.

Carbone's contribution is concerned with the issue of dynamic inconsistencies and explores the possible influence of temptation as a reason for such inconsistencies. Motivated by the literature on hyperbolic discounting, she uses an innovative experimental design to investigate whether subjects are affected by temptation. The design involves an experiment with two treatments – one a 'spot market' and the other a 'forward market' – which should detect the existence of hyperbolicity. Interestingly, she finds little evidence of such behaviour.

Morone and Fiore report on an experiment in which the famous Monty Hall's three doors anomaly "should" go away. They deliberately adopt a design (Monty Hall's Three Doors for Dummies") which does not rely on subjects being able to do Bayesian updating. Nevertheless the anomaly does not go away – suggesting that the reasons for the anomaly are deeper and different than previously thought.

Giardini et al. argue, on the basis of two experimental studies using a 'visual motion discrimination task', that the desirability of an outcome may bias the amount of confidence people assign to the likelihood of that outcome. The originality of the authors' results lies in their observation that the correlation between reward and confidence was not linked to change in accuracy. In other words, subjects were not more accurate in responding to the stimulus; they were just more confident in their performance when facing a higher reward.

### **Part IV: Experimental Interactive Decision Making**

The final section (on interactive experiments) contains three studies. That by Eichberger et al. extends the experimental study of ambiguity from individual decision making to interactive decision making (that is, to strategic games). The authors consider a non-standard situation in which players lack confidence in their equilibrium conjectures about opponents' play. They use "grannies, game theorists and fellow subjects" to introduce different levels of ambiguity in strategic games, and test comparative static propositions relating to changes in equilibrium with respect to changes in ambiguity.

Morone and Morone address the topic of guessing games with the objective of understanding whether people play in a rational or naïve way. They first develop a generalised theory of naïveté (that generalises the iterative naïve best replies strategy), and experimentally compare the iterative best replies strategy with the iterative elimination of dominated strategies for the generalised p-beauty contest.

Di Cagno and Sciubba explore network formation in a laboratory experiment. Instead of focusing on the traditional issue of convergence to a stable-network architecture, the authors use a network formation protocol suggesting that links are not unilateral, but have to be mutually agreed upon in order to form. The experimental results are analyzed from both ‘macro’ and ‘micro’ perspectives.

Taken together, the papers in this volume, a small subset of the papers presented at the 2006 FUR conference, show well what FUR is and what it does. We have already commented on the diversity of the papers in this volume, but the volume shows another facet of FUR – the desire and the ability to explore, both theoretically and empirically, new models of human behaviour. More importantly, as a study of the development of FUR over the years shows clearly, this volume manifests the clear and strong relationship between the theoretical and empirical developments: many of the empirical contributions would not have been possible without the earlier theoretical developments, and many of the theoretical papers are motivated by a desire to explain interesting phenomena thrown up by previous empirical papers. FUR demonstrates a strong commitment to interaction between theory and empirics. The editors of the present volume and the conference organizers are proud to contribute to keeping the FUR tradition alive.

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