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DECISIONS, GAMES AND MARKETS

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**13 ADOPTION OF FLEXIBLE TECHNOLOGIES
IN AN EVOLUTIONARY ENVIRONMENT**

Pier Luigi SACCO and Carlo SCARPA

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PREFACE

In the last few years Bocconi University has devoted a considerable amount of resources, energies and funds in order to boost its pure and applied research in Economics and Business. In particular, several researchers have contributed to a broad research program in microeconomic theory¹ in order to stimulate new developments in decision theory, game theory, general equilibrium theory and their applications to economics. The program involved Bocconi scholars as well as former alumni. This book collects some of the contributions presented in several seminars and conferences.

The book is divided into three parts. The first two contain mainly abstract, methodological contributions to Decision Theory (Part I) and Game Theory (Part II). Part III is a more heterogeneous set of essays on the theory of markets.

Part I: Decisions. In Chapter 1, Erio Castagnoli and Marco Li Calzi provide a unified and general analysis of duality for dominance relations in decision theory. They show how *direct* dual characterizations which are based on the dominance ordering over the set of alternatives (e.g. monetary lotteries) can be derived from *indirect* representations of the corresponding partial order over an associated space (e.g. the space of cumulative distribution functions). In Chapter 2, Marciano Siniscalchi relates the Sure Thing Principle to dynamic consistency properties for systems of conditional preferences over acts. He shows that a plausible notion of *partial* dynamic consistency can accommodate “Ellsberg-like” violations of the Sure Thing Principle.

Part II: Games. In Chapter 3, Pierpaolo Battigalli presents several characterizations of the observable deviators property for dynamic games with (possibly) incomplete information and extends some of his previous results about consistent assessments and sequential equilibria for this class of games. This game theoretic framework is also used in Chapter 4, where Pierpaolo Battigalli

¹The research program “Approccio individualistico ai fenomeni di auto-organizzazione e diffusione dell’informazione nei sistemi economici” (“Methodological individualism and the study of self-organization and diffusion of information in economic systems”) directed by Aldo Montesano.

and Danilo Guitoli argue that traditional (Bayes Nash) equilibrium analysis may be unjustified in situations with incomplete information and put forward alternative notions of *conjectural equilibrium* and *rationalizability* for dynamic games of incomplete information without a common prior. Their approach is illustrated by an application to a simple macroeconomic game. In Chapter 5, Pietro Veronesi analyzes a normal form solution concept related to extensive form rationalizability: the iterated deletion of weakly dominated strategies. He shows how this procedure relies on the notions of strategic *rationality orderings* and lexicographic expected utility maximization. He considers the case in which only the ordinal preferences over outcomes are common knowledge and provides a characterization result for a quite general class of games.

Part III: Markets. In Chapter 6, Alberto Bisin offers a provocative assessment of the literature on indeterminacy of economic equilibria in finite-dimensional models, arguing that indeterminacy results either derive from some form of “money illusion” or can be eliminated in an economically meaningful way. In Chapter 7, Sandro Brusco considers a financial market where prices are determined by a specialist monopolist having private knowledge of the order book. He derives the optimal pricing rule in the case of unsophisticated traders and the revealing rational expectations equilibrium in the case of sophisticated traders. In Chapter 8, Francesco Corielli considers the problems connected with the application of the law of large numbers in economies with a continuum of agents. In Chapter 9, Francesco Daveri and Fausto Panunzi study how labor mobility affects the relative desirability of decentralization vs. centralization in addressing soft budget constraint problems. They show that low mobility costs are a necessary condition for decentralization to contribute harden the firm’s budget constraint. In Chapter 10, Aldo Montesano provides a global characterization of efficient allocations by means of the sets of Pareto-maximal allocations and the sets of maximal distributable surplus allocations. Equivalence and duality between these sets are demonstrated under the only assumption of monotonicity between utilities and resources, without the assumption of convexity and including externalities. In Chapter 11, Giuseppe Moscarini and Marco Ottaviani present and discuss some models of social learning which appeared in the recent economic literature. They focus on the problems of information acquisition, stationarity of the environment and endogenous pricing. In Chapter 12, Marco Pagano analyzes the relationship between market size and risk in a rational expectations equilibrium model with many assets and transaction costs. The model predicts that conditional variance of stock returns is higher for thin stocks and that the relationship between thinness and stock return variability arises only from the unsystematic component of stock return risk. In Chapter 13, Pier Luigi Sacco and Carlo Scarpa consider the problem of the choice of a productive technology when the level of demand is

uncertain in an evolutionary framework. In their model firms tend to imitate the more rewarding technology choice. They characterize the stable distributions of technology choices, showing under what conditions firms of asymmetric sizes can coexist in the market.