Preface

Decision analysis in business economics is a set of quantitative tools that in a systematic manner carries out the evaluation of strategies and choices necessary for successful business. Decision analysis is based on hundreds of years of philosophical and practical thought about uncertainty and decision-making. The state-of-art of the field is very impressive, algorithms and problem-solving techniques are delicate and tailor made, yet the decision analysis has not become commonplace even in very important decisions. While there is no doubt that human nature is an ultimate limitation, maintaining clarity of concept and exploiting progress in the realms of scope, skill, and efficiency should lead to more widespread use.

The subject area of Handbook of Research on Tools and Techniques for Economic Decision Analysis is decision analysis in business economics and it is dedicated to promoting the advances in decision methodology and theory, but also in application possibilities of decision models in various aspects of business, and techniques for facilitating decision-making such as computer modelling software and expert systems for decision support.

Handbook of Research on Tools and Techniques for Economic Decision Analysis represents a comprehensive approach of decision analysis to business economics including all the relevant aspects from methods for decision-making under conditions of uncertainty or existence of multiple criteria, techniques of risk assessment and portfolio analysis to economic analysis of competitive and strategic decisions and research on decision-making in the field of operations management and business process management.

This book also aims at developing a systemic approach of economic decision while pointing out the importance of an analysis of both actors and their interactions so as to allow a better understanding of economic decision in a complex and changing world. In such an environment, the coordination of activities is characterized by a set of attributes that evolve over time while specifying the components and modes of interaction of the system. These attributes are the knowledge bases and technologies, the institutions (markets and economic policies), the organizations (firms and networks), which all together help to explain the constraints linked to the specificity of economic decision processes.

Because it involves some microscopic and macroscopic features, a systemic approach aims at providing a bridge between the two levels in studying emergent macro or collective regularities from the interaction of microeconomic diverse entities. Some chapters shall here try to import, on an appreciative mode, some of such concepts in the analysis of decision processes.

Thematically speaking, this book covers three sections: Finance (in particular financial markets, and finance and institutions), Economic Policy (discussing topics like governance, export promotion policy, labour markets, and sectoral policy), and Firms & Networks (including works about business decisions under risk and uncertainty, communication and management, multiple criteria decision aid, and social
Preface

networks). The three sections are balanced in size and illustrate how economic decision analysis can be applied in business economics problems.

The idea to start the book with contributions related to the finance literature came from the fact that finance has for a long been a fruitful ground for studying how individuals and organizations reach decisions that grant individual well-being and how such self-interest motivated actions bring optimal solutions to the society as a whole. The papers selected for this section of the book vary from those of general (conceptual) content to those that are mainly applicative, covering a specific segment of the financial market, or institution, or dealing with some specific decision making issue.

Chapter 1 – *Investment decision making: where do we stand?* gives a comprehensive overview of more than half a century long academia attempts to explore main drivers of securities return.

Elaborations start with the traditional perfect market model (CAPM), which assumes that the choice of investment portfolio is directed toward optimization between statistically defined risk and observable return of a universe of available investments, while the equilibrium assets pricing is determined simply by copying the superior investment strategy, in the setting of rational and homogeneous agents where information is common knowledge. The rigidity of assumptions on which traditional models are built has led to a plethora of variations where some of those assumptions are relaxed. An important breakthrough to the extant body of knowledge has been made by the introduction of the asymmetric information (and other forms of incomplete knowledge and judgmental bias) in the decision-making process. The chapter points out the main research dilemmas, i.e. academia response to the fact that real life may depart from “blackboard” theory. In their contributions here, authors rely on the legacy of renowned scholars of the relevant fields of expertise, but also on those coming from different intellectual traditions.

Chapter 2 – *Application of Markowitz portfolio theory by building optimal portfolio on the US stock market* is a test of traditional Sharpe-Lintner-Mossin CAPM. In a well-established tradition, the authors divided the genuine basket of US stocks (represented by Dow Jones Industrial Average) into several subsamples: low-beta portfolio, high-beta portfolio, and randomly (computer-driven) selected portfolio of stocks. Consequently, the optimal weights schemes were calculated.

Opposite to the suggestions of the mainstream theory, the authors showed that large beta portfolios could underperform low-beta portfolios. The authors advocate for the extension of the mainstream model assuming that size (market capitalization), book-to-market value and price/earnings ratios might have some explanatory power along with betas. Hence, it is another proof that more than a single variable is required to characterize the multidimensional nature of risk.

Chapter 3 – *Do judgmental factors lead to a good decision on investing in a currency or mislead the financial player? An application in Turkey* is an empirical study of different methods and techniques available to investors (traders) on financial markets. The author compares different time series models that are frequently used in forecasting the return on foreign exchange markets. The models were fed by the official transaction data for the most frequently used currency pairs in the foreign exchange market of Turkey. The selected methods (Moving Average, Single Exponential Smoothing Method, Holt’s Method, Winter’s Method, and Autoregressive Integrated Moving Average) are tested for accuracy with a battery of performance criteria, and within different forecasting horizons. The forecasting/decision making model delivered in this chapter allows using both objective forecast values and judgmental criteria, and it can be easily adapted in order to be used in a family of other time series models.

The *Finance* section closes with the Chapter 4 titled *The effects of prudential supervision on bank resiliency and profits in a multi-agent setting*. Once again, the asymmetric information was taken to be the feature of the ambience in which contributors were studying complex decision making interplay.
between actors. In this chapter the arena is financial regulation (prudential supervision), the game that is played between regulator and regulated entities in order to achieve a resilient financial intermediation. The authors investigated the choice that a regulator made between three regulatory solutions (tools): a monitoring norm, a market-based credit default swap (CDS) insurance mechanism and a tax (imposed on borrowers’ profit) in the form of a bail-in instrument. Asymmetric information is explicitly introduced by assuming that a bank does blind credit screening (unable to defer between good and bad borrowers at initial credit allocation phase) and a costly monitoring process. The authors employed numerical simulations in the multi-agent (prudential supervisor, a bank, their borrowers and in specific cases a CDS fund) virtual environment which allows agents to advance their decision making abilities by being able to learn from the past experience and respond in innovative ways. The chapter contributes to the general knowledge because it ranks different regulatory approaches in the novel way, and delivers clear-cut guidelines for regulatory policy. The findings indicate that prudential supervision is indisputably beneficial; the monitoring norm has at its best limited effects, market-based (CDS) solution is dependent on supervision efficiency, while tax bail-in mechanism provides a superior tool able to get a bank back to profitability and liquidity, and sustain long-lasting crisis conditions.

The second part of the book includes contributions that deal with application of contemporary quantitative economic analysis in economic policy decision-making. The papers selected for this section of the book vary from subjects of governance quality and its measurement to labor market flows and analysis of export significance in terms of growth dynamic and sustainability.

Chapter 5 - Measuring Governance: The Application of Grey Relational Analysis on World Governance Indicators provides an in-depth analysis of fundamental political economy issues - the quality of governance and the performance of government institutions in managing country’s economic and social resources. Based on rich theoretical and empirical literature, the chapter deals with the key problems related to state-level decision making. It offers a thorough elaboration of the issue of conceptual clarity of the term “governance”, the channels that link good governance to economic growth and the increasing interest in measuring the quality of governance. The research presented in this chapter accentuate that managing resources of national economies requires competent and informed decision-making, based on systematic measuring of government performance and propose an alternative tool for measuring the progress of the countries in providing an environment conducive to economic growth and social development.

Chapter 6 - Export-led Recovery in Portugal. Can it Also Sustain Growth? broadly analyzes connection between the significance of exports and the growth dynamic and its sustainability. This chapter focuses mainly on the nature of exporting activity - which industries, what share of domestic produced value added and which regional destination - as well as on the importance of domestic market for sustaining a well-established competitiveness for the exporters. This chapter investigates the dynamics among exports and output over the period 1970-2012 for Portugal. The methods of choice for the purpose of estimation are a bivariate VAR model with output and exports and apply co-integration and Granger causality and impulse response analysis.

In terms of sectoral policy, a fundamental problem is to discover which sectors are more correlated with creation of jobs and understand the aggregated fluctuations of the labor force. Authors of Chapter 7 make an interesting claim that shifts in labor demand among sectors, rather than changes in the level of aggregate demand, are the cause of cyclical variation in unemployment-to-employment transition. They apply an econometric model at European level to empirically discover three kinds of outflow rates (the speed with which an unemployed person can find an employed position). The panel analysis is the method applied and the data are provided using the KILM comprehensive database of country-level data.
(Key Indicators of the Labor Market) including 33 European countries over 5 year period (from 2008 to 2012). This kind of results are valuable tools for policy makers in their efforts to develop specific policy measures, i.e. targeting sectors with greater impact on outflow rates in order to mitigate the negative effects of economic crisis on labor force.

Last, numerical and quantitative approaches for economic policies design, can take the shape of unsupervised techniques. Popular applications under this setting are segmentation through clustering, rules generation (often by association analysis), social network analysis to infer connections among subjects, latent variables assessment through factor analysis, etc.

Chapter 8 illustrates how such an unsupervised methodology (cluster analysis) can be used to guide management decisions. Essentially, such a methodology is recommended to safeguard that the findings (e.g. survey findings) reflect substantial behaviors of the sample, and to allow legitimate, evidence-based decisions. Policy design implications for the specific domain of mussel farming are presented, revealing the potentials of typologies for economic decision analysis.

Manager and administrators in business and public sector organizations are perhaps the largest group of potential users of economic decision analysis. Therefore, the topic of the third section Firms & Networks comes without any surprise. Considering the implementation of decision analysis to this area, there are of course associated behavioral issues, however chapters of this section illustrate how quantitative methods are designed to support (groups of) decision makers to confront decision problems.

Perhaps the most evident obstacle for making economic decisions is the inherent large scale uncertainty of basic input data. Chapter 9, provides a comprehensive presentation of the basic concepts and the mainstream models, exemplified in an industry where large uncertainties are a regularity. Through running examples of hydrocarbon exploration and oil field development, readers can be introduced to the principles of making decisions under risk and uncertainty. As the relevant survey of managers demonstrated, these principles, as well as the basic models are of great practical importance for the industry.

As most economic issues, the theory of organizations has been erected in the light of the allocation of scarce resources inquiry. Such a theory takes it that (i) the purpose is to investigate the behaviour of firms as it affects allocation and distribution, (ii) the decision process of the firm is reduced to the fiction of one sole rational maximizing agent, (iii) the role of the firm is not qualitatively different from the role of market.

While considering the firm as a by-product of the exchange paradigm seems interesting when one investigates a static market coordination of isolated agents, it becomes quite inappropriate when one tries to deal with economic agents embedded in changing and interactive environments. It is through interactions and retroactions that the agents experiment their ‘model of the world’; it is through action that the agents put their own representation under control so that communications operate as a feedback mechanism on the construction of knowledge. Chapter 10 - Crisis communication and crisis management during the crisis, case study of Croatia – is particularly interested in the role of communication during crisis. The empirical study tends to confirm the growing importance given by firms to interactions and retroactions both for organizational learning or change management.

In every decision, using a single criterion approach is equivalent to deliberately discarding certain aspects of reality. Therefore, to reach an effective decision, it is necessary to develop a family of criteria that preserves, for each of them, the original concrete meaning of the decision’s objective. Considering multiple criteria appears therefore, a natural process, and probably every researcher of economic decision analysis will encounter at some point problems that need to be supported by solid multiple criteria decision aid methodologies. Chapter 11 mixes two MCDA techniques (AHP and TOPSIS) in an integrated
methodology that eventually suggests a ranking of to-be improved business processes. A modified Delphi method was implemented to create the family of criteria, AHP was used to assign significance weights to criteria, and then TOPSIS was applied to deliver the final ranking. An interesting point of this chapter is that it discusses the comparison of the proposed MCDA methodology with an established Six Sigma approach, that is commonly followed for the same goal (prioritize business processes for improvement).

Finally, beyond a certain level of complexity, the firm should take in account the benefits that can be derived from participating in organizational networks and increasing social capital. For this purpose, Chapter 12 - Rethinking social capital measurement – should allow economic actors to get a strategic positioning within their social sphere. By using graph theory, the chapter develops a direct measurement of social capital by means of two operational indicators, which are the “relational strength” and the “relational potential”. These indicators might be useful for designing network strategies especially in the global digital economy.

The Information and Communication Technologies (ICTs) have made networks pervasive and a widespread access to data possible. But data have no value if organizations, institutions and firms, are unable to combine and process them through complex decision processes. The rise of related technologies, like Internet, social networks or cloud computing, have increased the availability of data in such a way that the challenges of decision are no longer on information but on knowledge. And because they help to decipher data on changes in markets and organizations, Tools and Techniques for Economic Decision Analysis still matter.