

QUANTITATIVE
FINANCE

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Collected Works of Marida Bertocchi
Rita L D'Ecclesia, Stavros A Zenios, and William T Ziemba
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4 **Collected Works of Marida Bertocchi**

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10 This book aims to celebrate the memory of Marida Bertocchi, Full Professor of Applied Mathematics
11 in Economics and Finance at the University of Bergamo (Italy), who passed away on November 16th
12 2016, after a short and severe illness. To this aim the Editors complemented a collection of fifteen of her
13 research papers (out of more than 80 publications) with some biographic notes on her career and life.

14
15 I will start by recalling the sentence I wrote on the back cover of the book "In honor of a unique colleague
16 and reliable friend, this collection of works provides a taste of Marida's inexhaustible and eclectic research
17 activity." I believe that this sentence well synthetizes not only the book content, but also my feelings when
18 writing this review.

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20 Considering how difficult it is to encompass in a single volume the activity of a productive researcher as
21 Marida Bertocchi was, I think the book succeeds in doing it by selecting papers that represent what I
22 would see as three main research strands in Marida's work, which I will list now in a sort of chronological
23 order.

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25 The first research area, where Marida was engaged during her academic career until the early 90s, was
26 parallel computing and that period is well represented by the reprint of two single name contributions
27 (Chapters 2 and 3), where numerical results are produced but yet no financial or economic application is
28 presented.

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30 In a second stage Marida's interest was attracted by the applications of numerical techniques to different
31 problems in quantitative finance. In connection with this research area, the Editors selected four papers
32 on bond pricing and bond portfolio management where original results stem from more appropriate
33 modelling of market risk (Chapter 4, 5 and 7) and credit risk (Chapter 1), but also a contribution on asset
34 allocation that improves over Black Litterman approach (Chapter 9). Two papers, cast within actuarial
35 mathematics, propose new stochastic models for the estimation and the forecast of mortality rates
36 (Chapter 8 and 10), an issue that is still particularly relevant given western countries' population ageing.
37 All these papers in quantitative finance share a few common features that make them worth reading: they
38 all start off with a real world research question, they all tackle it by means of sound and state-of-the-art
39 methodologies and numerical techniques, and they all result from the collaboration with researchers from
40 different fields (mainly finance, operations research, mathematics, optimization theory) and different
41 countries in Europe and North America .

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43 Finally, the last five chapters (Chapters 11-15) prove Marida's renewed interest for stochastic and robust
44 optimization, but with a shift in terms of applications towards renewable energy systems and logistics.
45 Given the recent concern over these issues spurred by the 2030 ONU agenda, these papers, written
46 between 2012 and 2016, witness not only Marida's attention for real world problems but also her forward
47 looking attitude, which she always coupled with the rigour of a mathematician.

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49 Overall, a common research path linking all contributions by Marida Bertocchi may be identified in her
50 original interest in optimization techniques applied to valuation and decision problems under uncertainty.
51 In this respect, the formulation and solution of stochastic optimization problems in different application
52 areas required knowledge of large-scale optimization and numerical approaches, but also probability
53 theory and risk analysis with non trivial insights in the associated application fields. In a rapidly changing
54 and risky socio-economic environment, Marida's research interests and mathematical contributions help
55 understanding the scientific responsibility carried by an Internationally recognized scholar in this field and
56 period.

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58 Who should then read this book and what can a reader learn from it? Since all papers reprinted in the
59 volume report original results and are published on top academic journals in the three main research
60 areas mentioned above, it goes without saying that every single paper is worth reading for researchers
active on the specific topics represented in each paper. However, I would like to underline that there is

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3 another, maybe not so explicit, lesson to take away from this book: by going through it from Chapter 1 to
4 Chapter 15 and reading about Marida's life and career, students and researchers also learn that a
5 quantitative applied researcher has to adapt to and anticipate changes and needs of the socio-
6 demographic and economic systems in order to produce quantitative research, which is not merely
7 speculative but it is useful to solve real-world problems in economics and finance.
8

9 Marida Bertocchi was able not only to do this, but also to teach this: it comes with no surprise that most
10 of the papers are joint work with (former) doctoral students of hers. Unfortunately, she left us too soon,
11 but her scholars have the duty to pay it forward.
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13 Costanza Torricelli
14 Full Professor of Mathematical Finance
15 University of Modena and Reggio Emilia
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