

# Contents

1	Accumulation and amount functions . . . . .	4
2	Simple and Compound Accumulation Models . . . . .	11
3	Present Value and Discount Function . . . . .	22
4	The Basics of Annuity Theory . . . . .	34
5	Annuity Values on Any Date . . . . .	48
6	Varying Annuities . . . . .	64
7	More Frequent Annuities . . . . .	82
8	Loan Repayment Methods . . . . .	101
9	Assessment Methods of Investment Projects . . . . .	120
10	Bonds, T-Bills, Duration and Immunization . . . . .	132

# Preface

The goal of this book is to present applications of the selected theory introduced in "Theory of Interest" by Kellison (see [4] in Bibliography) in the form of a collection of problems accompanied by their solutions. Exercises are studied in detail to encourage students to selfimmense to the world of finance by analyzing various situations from real life, which are faced not only by investors. At the beginning of each chapter, there is a short revision of terms, formulas, and basic definitions.

In addition to "Theory of Interest", we recommend reading other reference materials, e.g. [1], [2], [3], [5], and [6] included in Bibliography to broaden the knowledge associated with the topics.<sup>1</sup> The scope of the book is suitable for students familiar with calculus at the Lodz University of Technology, in particular, of Applied Mathematics, International Faculty of Engineering, and any other fields of studies in the "Introduction to Financial Mathematics" course. Nevertheless, it can be also useful for students from other universities making their first steps in financial mathematics.

---

<sup>1</sup>[1] - chapter 10, [2] - chapters 3, 9, and 10, [3] - chapters 1–8, and 10, [4] - chapters 1–10, [5] - chapter 10, [6] - chapters 1–5, 8, 9, and 10.