

---

# Contents

---

<b>Introduction</b> . . . . .	vii
<b>Chapter 1. Optimization Problems</b> . . . . .	1
1.1. Portfolio optimization problem . . . . .	2
1.1.1. Portfolio value . . . . .	2
1.1.2. Optimization problem . . . . .	5
1.1.3. Examples of utility functions . . . . .	7
1.2. Duality approach . . . . .	11
1.2.1. Change of probability measures . . . . .	13
1.2.2. Dual optimization problem . . . . .	13
1.2.3. Examples . . . . .	18
1.3. Dynamic programming principle . . . . .	23
1.4. Several explicit examples . . . . .	28
1.4.1. Brownian setting . . . . .	28
1.4.2. Brownian setting with additive utility weight . . . . .	33
1.5. Brownian-Poisson filtration with general utility weights . . . . .	39
1.5.1. Logarithmic utility . . . . .	42
<b>Chapter 2. Enlargement of Filtration</b> . . . . .	45
2.1. Conditional law and density hypothesis . . . . .	46
2.2. Initial enlargement of filtration . . . . .	51
2.2.1. Martingales of the enlarged filtration . . . . .	52
2.2.2. Example of a Brownian-Poisson filtration and information drift . . . . .	57
2.2.3. Noisy initial enlargements . . . . .	58
2.3. Progressive enlargement of filtration . . . . .	60
2.3.1. Conditional expectation . . . . .	62

2.3.2. Right-continuity of the enlarged filtration . . . . .	64
2.3.3. Martingale characterization . . . . .	66
2.3.4. Dynamic enlargement with a process . . . . .	69
<b>Chapter 3. Portfolio Optimization with Credit Risk . . . . .</b>	<b>71</b>
3.1. Model setup . . . . .	73
3.1.1. Preliminaries . . . . .	73
3.1.2. The optimization problem . . . . .	79
3.2. Direct method with the logarithmic utility . . . . .	81
3.3. Optimization for standard investor: power utility . . . . .	83
3.3.1. Decomposition of the optimization problem . . . . .	84
3.3.2. Solution to the after-default optimization problem . . . . .	88
3.3.3. Resolution of the before-default optimization problem . . . . .	91
3.3.4. Example and numerical illustrations . . . . .	101
3.4. Decomposition method with the exponential utility . . . . .	106
3.5. Optimization with insider's information . . . . .	113
3.5.1. Insider's optimization problem . . . . .	114
3.5.2. Decomposition of the optimization problem . . . . .	119
3.5.3. The logarithmic utility case . . . . .	127
3.5.4. Power utility case . . . . .	129
3.6. Numerical illustrations . . . . .	133
<b>Chapter 4. Portfolio Optimization with Information Asymmetry . . . . .</b>	<b>141</b>
4.1. The market . . . . .	143
4.1.1. Risk neutral probabilities measures for insider . . . . .	145
4.1.2. Solution of the optimization problem . . . . .	147
4.2. Optimal strategies in some examples of side-information . . . . .	147
4.2.1. Initial strong insider . . . . .	147
4.2.2. There exist $i$ , $1 \leq i \leq d$ , such that $L = \mathbf{1}_{[a,b]}(S_{T'}^i)$ , $0 < a < b$ . . . . .	149
4.2.3. $L = \log(S_{T'}^{i_1}) - \log(S_{T'}^{i_2})$ . . . . .	155
4.3. Numerical illustrations . . . . .	157
4.3.1. $L = \mathbf{1}_{[a,b]}(S_{T'}^1)$ , $0 < a < b$ . . . . .	158
4.3.2. $L = \log(S_{T'}^1) - \log(S_{T'}^2)$ . . . . .	159
4.3.3. $L = \mathbf{1}_{[a,b]}(S_{T'}^1)$ . . . . .	160
4.3.4. $L = \log(S_{T'}^1) - \log(S_{T'}^2)$ . . . . .	160
<b>Bibliography . . . . .</b>	<b>165</b>
<b>Index . . . . .</b>	<b>175</b>