

DATA 5690 Class Notes

Computational Methods for Fintech

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Preface

Introduction

This is a book created from markdown and executable code.

See Knuth for additional discussion of literate programming.

Part I

The Political Economy of Fintech

1 Catallactics

This chapter will cover theory of catallactics. See Mises, Ludwig von (2007).

Part II

Foundations

2 Analysis of Deterministic Cash Flows

This section will cover basic time value of money calculations. The main references will be Chapter 2 of Luenberger, David G. (2013).

3 Probability

This section will cover probability. The main references will be Chapter 2 of Martinez & Martinez (2016).

4 Frequentist Sampling Theory

This chapter will cover the frequentist approach to probability and statistics. The main reference will be Chapter 3 of Martinez & Martinez (2016).

5 Operational Subjective Statistical Methods

An introduction to OSSM.

Part III

Option Pricing

6 Option Pricing Theory

... when judged by its ability to explain the empirical data, option pricing theory is the most successful theory not only in finance, but in all of economics. – Stephen Ross

7 Monte Carlo Methods for Option Pricing

8 Real Options Theory

- Search theory
- Reinforcement learning
- Real options (OHMC)

References

- Luenberger, David G. (2013). *Investment Science* (2nd ed.). Oxford University Press.
- Martinez, W. L., & Martinez, A. R. (2016). *Computational Statistics Handbook with Matlab* (Third). CRC Press.
- Mises, Ludwig von. (2007). *Human Action: A Treatise on Economics* (Vol. 1). Liberty Fund.