金融数学

2020-09-09

目录

欢迎来到**金融数学**!

在这里，我们同步课堂，总结每章的**重点、难点**，并发布**课后作业**。课后作业需在下次上课前交到老师信箱（明主 1036 门外邮箱柜右下角）。

我们这里主要以英文表述，有以下两个原因

1. 方便大家准备 SOA/CAS 的 Exam FM: Financial Mathematics考试；
2. 方便大家阅读相关英文文献。

此网站由授课老师高光远、助教程轶鹏、助教胡夏新管理，欢迎大家反馈意见到助教、微信群、或邮箱guangyuan.gao@ruc.edu.cn。

Chapter 1

Interest rate

1.1 Key concepts

Functions

- Accumulation function
- Discount function

Interest rate

- Effective rate of interest/discount
- Simple interest
- Compound interest
- Nominal rate of interest/discount
- Force of interest/discount

Values

- Accumulated value (future value)

- Present value

1.2 Key equations

$$a(t) = e^{\delta t}$$

$$d = \frac{i}{1+i}$$

1.3 Homework

1.3.1 Week 1

Problem 1

John invests X in a fund growing in accordance with the accumulation function implied by the amount function

$$A(t) = 4t^2 + 8t + 4.$$

Edna invests X in another fund growing in accordance with the accumulation function implied by the amount function

$$A(t) = 4t^2 + 2.$$

When does Edna's investment *exceed* John's?

Problem 2

What deposit made today will provide for a payment of \$1000 in 1 year and \$2000 in 3 years, if the effective rate of interest is 7.5%?

表 1.1: The cash flows of the three projects.

End of year	Project A	Project B	Project C
1	500	500	500
2	500	300	250
3	-175	-175	-175
4	100	150	200
5	0	200	200

Problem 3

Company X received the approval to start no more than two projects in the current calendar year. Three different projects were recommended, each of which requires an investment of 800 to be made at the beginning of the year.

The cash flows for each of the three projects are as follows:

The company uses an annual effective interest rate of 10% to discount its cash flows.

1.3.2 Week 2