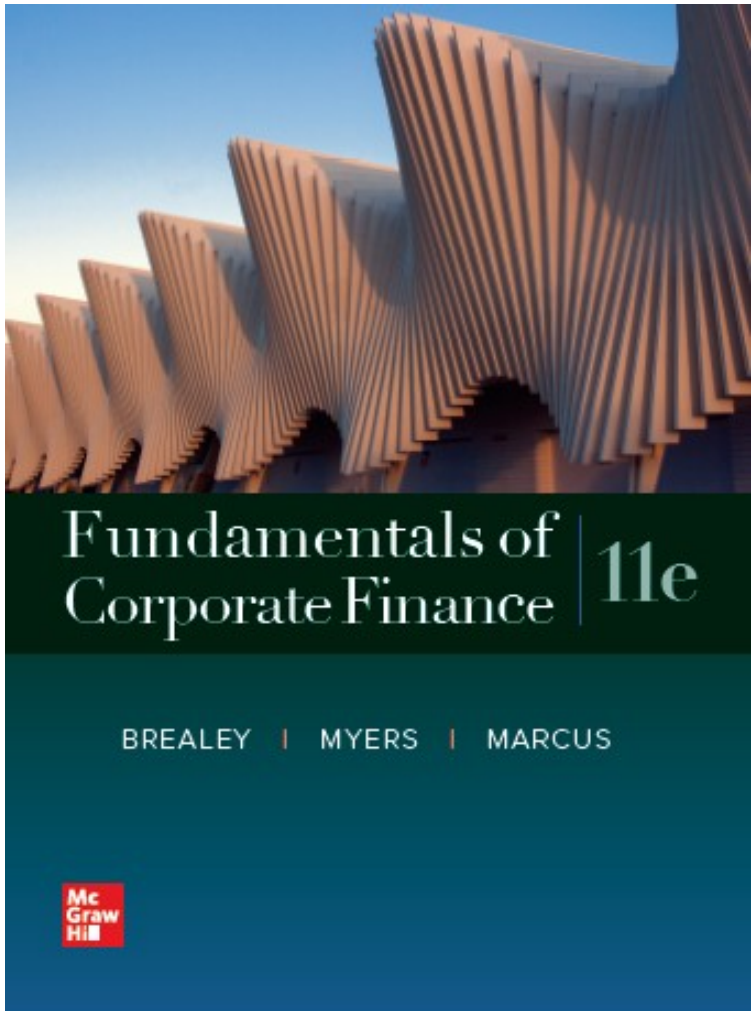
Fundamentals of Corporate Finance, 11th Edition

CHAPTER 5: The Time Value Of Money



Time Value of Money

- Let's start this week with a quick review of a couple of last week's HW problems
- Focus on "thought process" to find solution
  - **Excel**

Time Value of Money (Applications)

- The PV formula has many applications. Given any variables in the equation, you can solve for the remaining variable. **Excel**

$$PV = \text{future payment} \times \frac{1}{(1 + r)t}$$

Perpetuities and Annuities

- Annuity
  - Level stream of cash flows at regular intervals with payment at END of time period, with a finite maturity
  - Can use similar approach as you use for Cash Flow Stream
  - Can also use PMT (payment) function in Excel or calculator

Calculations: Part 1 – Financial Calculators

Example

You need a 6.5% annual return to justify the risks of the following financial contract: you will receive annual payments of $50 for five years and one lump sum payment of $1,000 in five years. What price should you pay for the contract?

- 1000
- 50 50 50 50 50
- 0 1 2 3 4 5
- ? r = 6.5%

- PV function in Excel: $937.66 (discuss)

Perpetuities and Annuities

- Annuity Due
  - Level stream of cash flows at regular intervals with payment at BEGINNING of time period, with a finite maturity
  - Can use similar approach as you use for Cash Flow Stream
  - Can also use PMT (payment) function in Excel or calculator

Perpetuities and Annuities

- Annuity Due
  - See Excel for example

Perpetuities and Annuities

- Perpetuity
  - A stream of level cash payments that never ends
  - Difficult: an infinite stream of payments that nevertheless has a finite value

Perpetuities and Annuities

- PV of Perpetuity Formula

$$PV = \frac{PMT}{r}$$

PMT = cash payment

r = interest rate

"Capitalization"

Perpetuities and Annuities

Example

In order to create an endowment, which pays $100,000 per year forever, how much money must be set aside today in the rate of interest is 10%?

called “capitalizing” the cash flow stream

Perpetuities and Annuities

Example, continued

To understand Perpetuity, re-arrange the math:

is the same as

$1,000,000 x .10 =$100,000
Why is your account worth $1M?
Because it produces annual Cash Flow
of $100K for the 10% risk