PROBLEM SET: Discounting

Exercise 1. *Kangaroo autos (BM 3.10)* [3]

Kangaroo Autos is offering free credit on a new $10,000 car. You pay $1,000 down and then $300 a month for the next 30 months. Turtle Motors next door does not offer free credit but will give you $1,000 off the list price.

1. If the rate of interest is 10 percent a year, which company is offering the better deal?

Exercise 2. *Bahamas* [2]

Suppose you are saving for a trip to the Bahamas in two years and will need $2000 at that time. The rate at which you can invest is 10%.

1. How much will you need to invest today to have enough money to make your trip two years from now?

Exercise 3. *Project* [2]

An investment project offers the following pattern of cash flows.

Time (t)	Cash Flow (C_T)
0	-$1000
1	500
2	750
3	250

The appropriate discount rate is 10%.

1. What is the NPV of the investment project?

Exercise 4. *Investment choices* [3]

Suppose the firm has the following investment opportunities:

Project	Cost	Cash Flow next year
A	100,000	125,000
B	200,000	260,000
C	300,000	330,000
D	400,000	480,000

The firm has $400,000 of cash available for investment. The opportunity cost of capital is 15%.

1. Compute the NPV of each project. Which projects should the firm invest in?
2. How much will the firm need to borrow to meet its optimal investment plans if it pays no dividend at $t = 0$?
3. What dividend will the firm pay to its shareholders next year (at $t = 1$)?
4. What is the current market value of the firms shares?
5. How do your answers to part 1 change if the firms pays it's shareholders a dividend of $200,000 at $t = 0$?

Exercise 5. *Arnold's autos.* [3]

You are interested in buying a new car. Your car dealer (Arnold's autos) offers to sell you the car for $10,000 cash or $5,000 per year for the next 3 years. Your banker has agreed to lend you the $10,000 to purchase the car if you repay the bank $499.24 per month for the next 2 years. Your mother has also agreed to lend you the $10,000 if you pay her $2,000 per year for 4 years and a balloon payment of $12,000 in the fifth year.

1. If these are your only alternatives, what should you do?

Exercise 6. *Telephones* [5]

Marcus Boruc has been working on a new hands-free telephone that clips into your ear. The new gadget has now been cleared for manufacture and development. Marcus anticipates his first annual cash flow from the phone to be €200,000, received two years from today. Subsequent annual cash flows will grow at 5% in perpetuity. What is the present value of the phone if the discount rate is 10%?