Quantitative Tools - level I
Fall 2015
Exercises 4 - Core Vales & Dispersion & OLS

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1 Simple interest

Bob borrows $40,000$\$ at the annual interest of 5%. It should be repaid with two equals payments the 4th and 12th month. Bob should pay 0.5% of charge paid the first day.

1. What is the value of the repayment ?
2. What is the effective interest rate ?

Alice had a loan of $1,000$\$ to repay in 10 days. She's running out of cash and ask its bank to repay it in 20 days. The annual interest is 5%.

1. How much should Alice repay in 20 days ?

A firm decides to repay a loan of $500,000$\$ 10 days before the due date. The commercial discount rate is 10%.

1. How much will the firm gain ?
2. When does this first loan is equivalent to a second loan of $510,000$\$ due 30 days after the due date of the first loan ?

A firm has three loans of $20,000$\$, $30,000$\$ and $15,000$\$ of respective due dates 10, 20 and 30 days. The firm want to repay in one single payment in 45 days. The commercial discount rate is 4%.

1. How much will the firm need to repay ?
2. If, instead, the firm had decided to make a single payment of $55,000$\$. What would have the due date been ?

2 Compound Interests

1. Bob has invested $100,000$\$ for three years at the annual interest rate of 5%. How many Bob will have in 3 years ?
2. Alice wants to buy a new bike at $1,000$\$ (that's expensive, but the bike is pink with fixed gear). How many should she invest now at the monthly rate of 5%, to get enough money in 7 months.

3. Dave had invested $1,000$\$ during ten years. At the end, he finally got $2,000$\$. At which annual interest rate did Dave invest ?

Alice had a loan of $1,000$\$ to repay in 10 days. She's running out of cash and ask its bank to repay it in 20 days. The daily interest is 5%.

1. How much should Alice repay in 20 days ?

A firm decides to repay a loan of $500,000$\$ 10 days before the due date. The daily discount rate is 10%.

1. How much will the firm gain ?
2. When does this first loan is equivalent to a second loan of $510,000$\$ due 30 days after the due date of the first loan ?

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