4   Problem Set 4.i

Bank/Commercial Discounting

Problem 1

Canasa deposits a batch of three bills of 50.000€ each, and they are due in 30, 60 and 90 days, respectively. The discount rate is 12% annual. Compute the amount of cash received.

Problem 2

Canasa wants to discount a bill: 90.000€ due in 10 days. The bank applies a discount rate of 12%, with a minimum forfeit of 15 days. Compute the cash received and the implied financing cost (to compute the financing cost use 365 days in a year and (a) simple rational discounting and (b) compound discounting)

Problem 3

Michelle wants to buy a laptop for her son for 900€. The retailer offers her the "Formula 12%":

1. pay one final installment of 900€ in 12 months plus a 12% initial charge. Determine for Michelle what is the annual effective interest rate of the loan (loans use compound discounting)

2. pay 10 monthly IOUs of 90€ each plus an initial charge of 6% on the laptop price.   Determine for Michelle what is the annual effective interest rate of this form of payment after converting the 10 IOUs into a single equivalent one (using the average due date as the "loan repayment date")

Supplier financing, Cash Discounts

Problem 4

Michelle's firm want to discount an IOU for 4.000€ which is due in 45 days. The bank offers the "4,5% discount" deal: 1% annual discount with a 3,5% upfront charge . What is the effective APR that Michelle's firm is paying when discounting the IOU?

Problem 5

Michelle owes 90,000€ to her supplier (SOON), to be paid in 60 days time. SOON offers a 3% discount if she pays immediately. What is the annual effective interest rate that Michelle is paying by waiting 60 days (and hence to "borrow" from SOON).

Problem 6

Muchcash LLC is one of Michelle's client that pays 30 days after purchase. Muchcash offers to pay cash upfront if they get a 4% discount for paying in cash. What effective annual interest rate is Michelle's firm paying if they accept Muchcash's offer?

Effective Rates

Problem 7

Mr. JAUP decides to deposit 20000€ that he has saved up in the following savings account with a growing interest from his trusted bank. The details of the account are as follows:

Interest rate	1st year 2.25% effective APR (TAE) 2nd year 2.5% effective APR 3rd year 3% effective APR
Compounding period (to choose from)	Monthly Quarterly Annual Single interest payment at the end (in which case the interest rate will be 2,585% effective APR)
Early cancelation	Penalty: 1% of the remaining balance at the time of cancelation

To solve

1. The amount he can withdraw if he is forced to take the money out after two years (and having selected monthly compounding).

2. Final balance if he chooses a single interest payment at the end.

Problem 8

On 7/1/2010 you go to the New Year's sale and spend a total of 3000€. You have two payment options

1. Credit card: 3 equal payments, paid each month with the first payment due 4 months from today. The salesperson informs you that the interest rate on these transaction is a 7% nominal APR

2. A formal loan: a single payment due 6 months from today. In this case the effective APR is 6%.

Compute the dated payments for each of the two options

Problem 9

Suppose you invest 3000€ in the account described in the ad below, and leave the money there for 3 years.

1. What will your effective average annual return be? [assume yearly capitalization]

2. How much would we need to invest in order to obtain 6.000€ in 3 years' time?

Past Exam Questions

Problem 10 (EX 2013)

You own a store and decide to accept payment using credit cards, in addition to the cash payments you were alreading accepting. If a client pays by credit card the bank will keep 4% and pay you 96% of the purchase, and you will only receive the money one month after the purchase. You keep a cash account that offers you a 4% monthly interest rate. Determine the maximum cash discount that you would offer clients who pay in cash to get them not to use a credit card

Problem 11 (EX 2011)

On 01/01/2009, Mr. Juan signed a contract with his bank to deposit 100.000€ each year until 01/01/2011 (thre payments in total). The bank pays a 6% nominal annual interest rate on the deposits with compounding every 4 months. On June 30th, 2012, Juan's son asks his father for money to buy an apartment. Mortgage prices have gone up a lot and he determines that he would rather pay in cash. Juan cashes out his deposit. In addition, he has an IOU from his business for 500.000€ which is due on December 31, 2012. The bank discounts the bill at a 3% annual interest rate. How much money can Juan lend his son on June 30, 2012, with the money from the deposit account and the IOU? (use 30:360 day count convention for the IOU)

Problem 12 (EX 2013)

A company discounts IOUs at a bank which are due in 90 days. It receives15000€. If the interest rate for commercial discounting is 15%, determine the total nominal value of the IOUs

Problem 13 (EX 2013)

Company X needs cash now and takes all of its IOUs to be discounted at the bank. The bank discounts at 4%. The IOUs are: 3 of 10.000 euros each, due in 30 days, 1 of 30000 euros due in 60 days, 2 of 15000 due in 90 days. Determine the cash the company receives from the bank

Problem 14 (EX 2017)

Your firm takes a number of IOUs to the bank for discounting with the following nominal values and maturity dates: a) 3 IOUs with a nominal value of 10 000 euros, due in 35 days b) 2 IOUs with a nominal value of 20 000 euros, due in 60 days c) 3 IOUs with a nominal value of 45 000 euros, due in 90 days The bank offers a 5% interest for these. Determine how much cash your firm will receive from the bank.