You have a short-term promissory note payable in 12 months. The nominal value of the note is now 15,000.00 and the interest rate guaranteed by this IOU is 5.5% p.a.. One month later you will decide to sell the promissory note in the market at discount rate of 11% p.a. How much will you obtain from your short-term promissory note? How long must you hold the IOU if you like to sell it at least for 15,000.00?

a. $FV = 15000*(1+0,055) = 15825$

$PV(after1m) = 15825*(1-0,11*11/12) = 14229,31$

b. $15000=15825*(1-0,11*t)$

$t=(1-15000/15825)/0,11$

$t= 0,473934$

You have to keep the IOU $360-0,473934*360 = 190$ days (6 m and 10 days)

How long must you keep $100.00 deposited at a bank with an interest rate of 7.5% p. a., if you will obtain $123.7863? The bank calculates the interest semiannually. Maximize your utility.

$123,7863=100*(1+0,075/2)^{(n)}$

$n=\ln(123,7863/100)/\ln(1,0375)=5,796345$ (number of whole IP)

$123,7863=100*1,0375^5*(1+0,075*t)$

$t=0,396675$ (of a year)

To maximize the utility (use combined interest) ... 2 years 10 months and 23 days.

How much will be the future value of 1,000,000.00 in 10 years? For the calculation use the concept of continuous interest. Further you know that the effective interest rate is 3.2%.

$f=\ln(1+0,032)=0,031499$

$FV=1000000*e^{(0,031499*10)} = 1370241$

How much money will be created in the economy by the multiplier effect, if 20,000.00 will be deposited and the minimum bank reserves (of deposits at Central bank) is 4 %?

Amount of money $= 20000/0,04=500000$

What will be the future value of your deposited 100.00 in 3.3 years? The bank promised you an interest rate 3.7 % p. a. and the interest will be calculated four times a year. Further consider taxes, which are paid every year (at the end of a year). The tax rate is 15 %.

$$FV(tax)=100*(((1+0,037/4)^4-1)*0,85+1)^3*((((1+0,037/4)*(1+0,037*0,05)-1)*0,85)+1)=110,9133$$