Exercise 12.2

Question

12.2. Student Finances
You are a student with a monthly income of only $600, and in some difficulty.

- You owe the student store $200, on which you pay an 18%/yr interest rate, calculated monthly, on unpaid balances.
- Your bicycle was just stolen and you want to buy one that regularly sells for $220, but is selling for $200, this week only, for cash.
- Your room and board is prepaid and you need $100 in expense money for the month.
- You have a $100 Savings Bond that earns 5%/yr, and $200 in the local savings bank that earns 6%/yr.
- You have $300 in a checking account. This money earns no interest and requires a $1.50 service charge for any month in which the balance is less than $200.

(a) How should you change your investments, if at all?
(b) What is your opportunity cost of another $100 this month?
(c) If you buy the bike this week, rather than next month at $220, what is its true cost?
(d) What is your discount rate?

Solution from Manual

12.2 Student Finances

a) The student's money is currently invested as follows:
   $200 at 9% (saving a $1.50 monthly service charge at the bank)
   $200 at 6% (the savings bank)
   $100 at 5% (the bond)
   $100 at 0% (the cash above 200 in the bank account)

The student's opportunities are
   $200 for a month to save $20 thus 10% a month
   $200 at 18% (the store bill)

The student should consequently redeploy his assets, disposing of the low return placements and putting the money in the high returns. That is, he spends $400 on paying for the bicycle and the store bill.

b) If he had an extra $100 he could keep it in the savings bank at 6%.

c) Buying the bicycle now means that he loses interest on the savings account that is 6%/year or 1/2%/month or $1. The true cost is thus $201.

d) 6% for additional money; at least 9% if he were to have less money and thus incur service charges at the bank.
Additional Notes

The last point about the discount rate being 9% if there is less money is critical to this question, which might look similar as part b). The reason the discount rate is 6% is because we have exactly exhausted all other investment opportunities with higher return with exactly $600. Had we have $500 at our disposal, then the discount rate would still be 9% because we would aim at filling out this investment opportunity first.