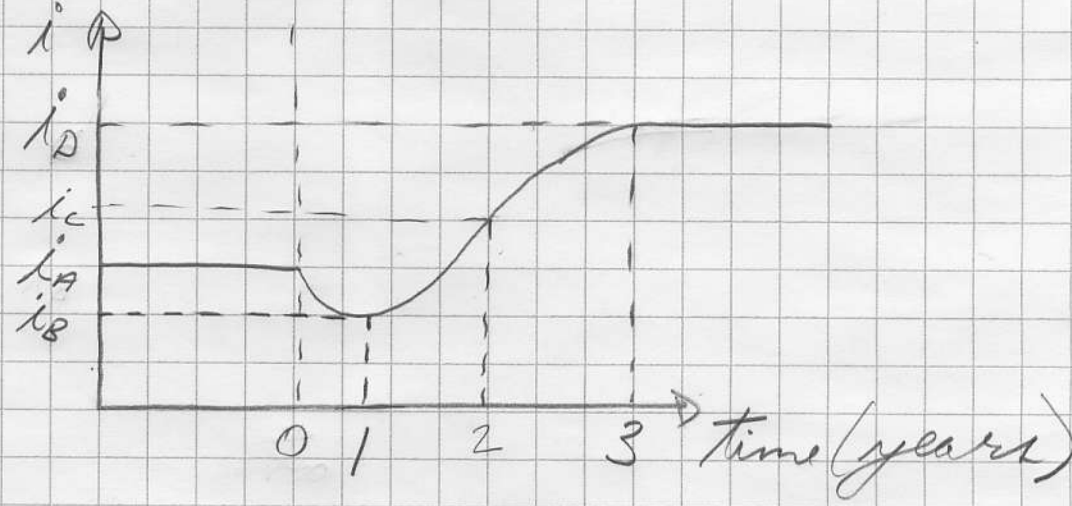
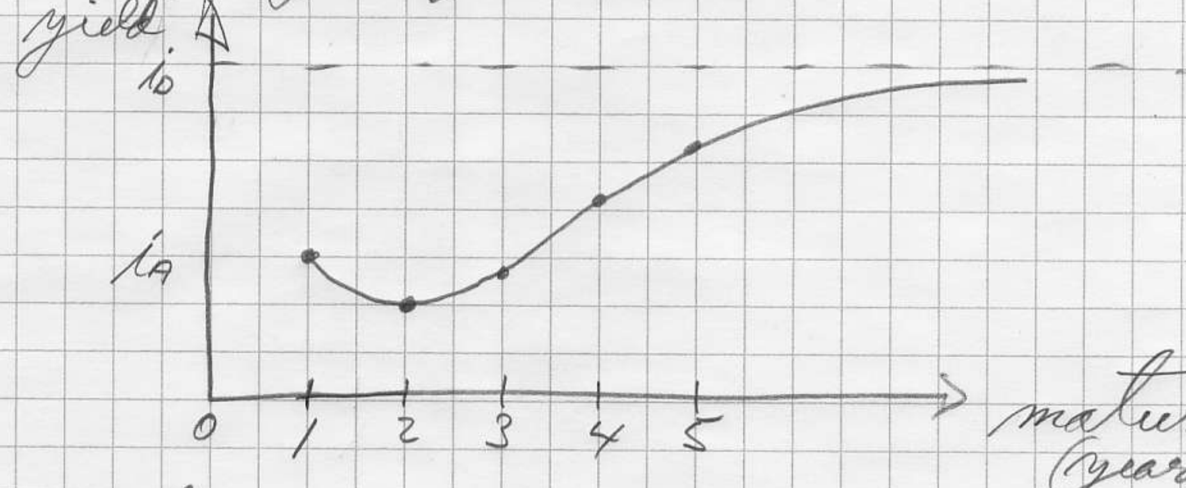
6)

a)



b)

i) Yield curve at $t = 0^+$ (just after monetary expansion):



$$i_{10} = i_A$$

$$i_{20} = \frac{1}{2}(i_A + i_B) < i_A$$

$$i_{30} = \frac{1}{3}(i_A + i_B + i_C) > i_{20}$$

$$i_{40} = \frac{1}{4}(i_A + i_B + i_C + i_D) > i_{30}$$

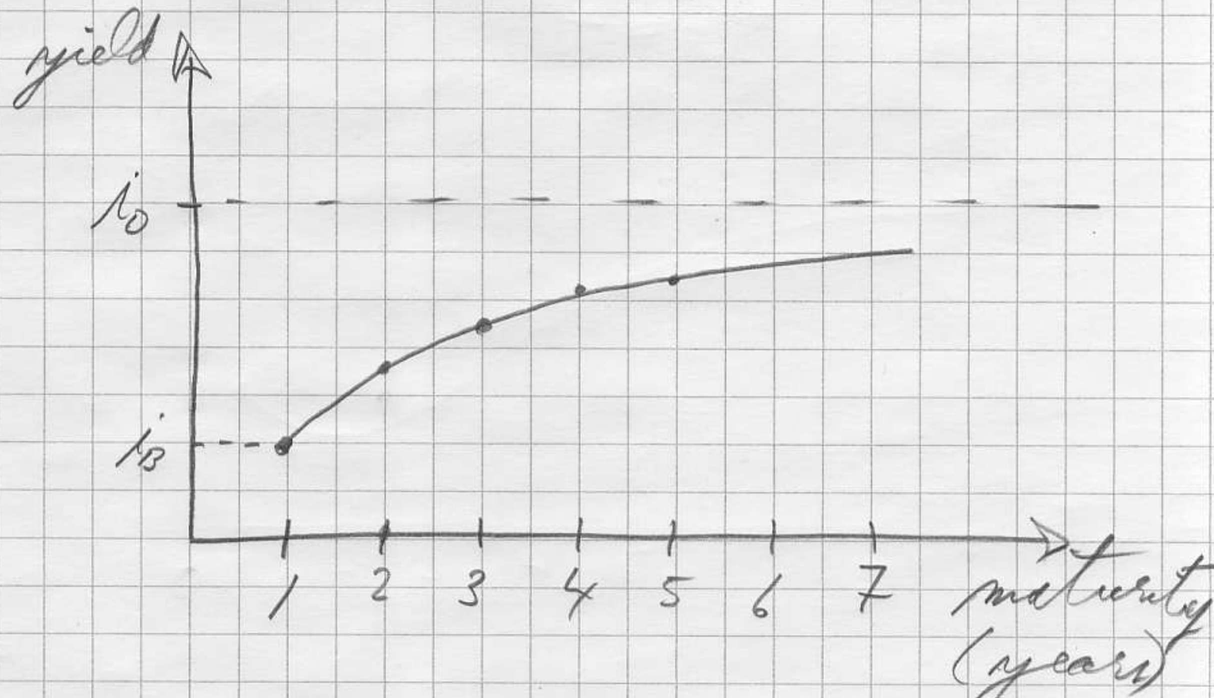
$$\ldots \quad i_{n0} = \frac{1}{n}(i_A + i_B + i_C + (n-3)i_D) > i_{40}$$

$$\lim_{n \to \infty} i_{n0} = i_D$$

ii) Yield curve at $t = 1$:

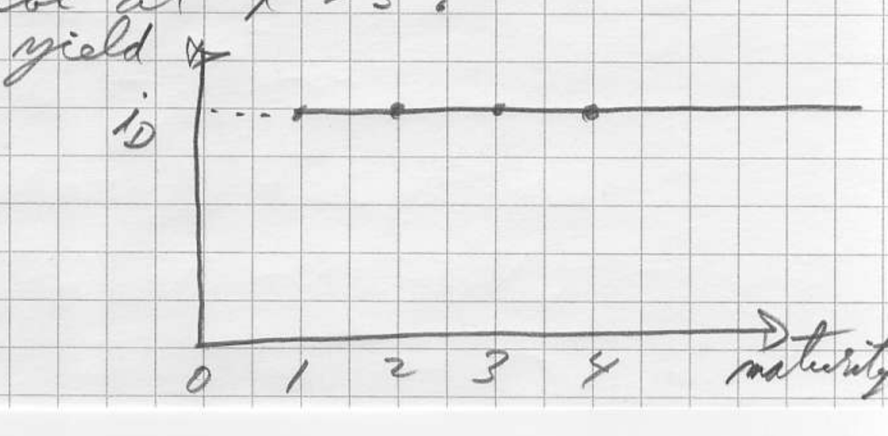
$$i_{11} = i_B$$
$$i_{21} = \frac{1}{2}(i_B + i_C) > i_{11}$$
$$i_{31} = \frac{1}{3}(i_B + i_C + i_D) > i_{21}$$
$$i_{41} = \frac{1}{4}(i_B + i_C + 2i_D) > i_{31}$$
$$i_{n1} = \frac{1}{n}(i_B + i_C + (n-2)\, i_D) > i_{41}$$

$$\lim_{n\to\infty} i_{n1} = i_D .$$



iii) Yield curve at $t = 3$:

$$i_{13} = i_D$$
$$i_{23} = \frac{1}{2}(i_D + i_D) = i_D$$
$$i_{n3} = i_D, \ \forall n$$



7) $(1+i_t) = (1+i_t^*)\dfrac{E^e_{t+1}}{E_t}$

substitute: $1+i_t = (1+r_t)(1+\pi^e_t)$

$$\Rightarrow (1+r_t)(1+\pi^e_t) = (1+r_t^*)(1+\pi_t^{*e})\frac{E^e_{t+1}}{E_t} \quad [A]$$

We also have:

$$\pi_t^e = \frac{P^e_{t+1} - P_t}{P_t} = \frac{P^e_{t+1}}{P_t} - 1 \Rightarrow 1+\pi_t^e = \frac{P^e_{t+1}}{P_t}$$

Substitute into [A] to get

$$(1+r_t)\frac{P^e_{t+1}}{P_t} = (1+r_t^*)\frac{P^{*e}_{t+1}}{P^*_t}\frac{E^e_{t+1}}{E_t}$$

$$\Rightarrow (1+r_t) = (1+r_t^*)\, E^e_{t+1}\left(\frac{P^{*e}_{t+1}}{P^e_{t+1}}\right) \Big/ E_t\left(\frac{P^*_t}{P_t}\right)$$

Since $\epsilon_t = E_t\dfrac{P^*_t}{P_t}$ and $\epsilon^e_{t+1} = E_{t+1}\dfrac{P^{*e}_{t+1}}{P^e_{t+1}}$

we get

$$1+r_t = (1+r_t^*)\,\epsilon^e_{t+1}\big/\epsilon_t .$$

✓

8) a) Real depreciation:

Interest parity implies:

$$(1+r_{10,0})^{10} = (1+r^*_{10,0})^{10} \frac{\mathcal{E}^e_{10}}{\mathcal{E}_0}$$

We also have:

$$1+r = \frac{1+i}{1+\pi}$$

Hence:

$$\left(\frac{1.1}{1.06}\right)^{10} = \left(\frac{1.06}{1.03}\right)^{10} \frac{\mathcal{E}^e_{10}}{\mathcal{E}_0}$$

$$\Rightarrow \frac{\mathcal{E}^e_{10}}{\mathcal{E}_0} = 1.087$$

Total depreciation over the 10 years is expected to be 8.7%.

This corresponds to an annual real depreciation of <u>approximately</u>:

$$\frac{8.7\%}{10} = 0.87\%$$

The <u>exact</u> annual depreciation is

$$(1+d)^{10} = 1.087 \Rightarrow d = 0.84\%.$$

8.b) Nominal Depreciation:

Nominal interest parity implies:

$$(1+i_{10,0})^{10} = (1+i^*_{10,0})^{10}\,\frac{E^e_{10}}{E_0}$$

$$\Rightarrow (1.1)^{10} = (1.06)^{10}\,\frac{E^e_{10}}{E_0}$$

$$\Rightarrow \frac{E^e_{10}}{E_0} = 1.448$$

Total nominal depreciation = 44.%.

Annual nominal depreciation is thus:

$$(1.448)^{1/10} - 1 = 3.77\%$$

8.c) Nominal appreciation implies

$$\frac{E^e_{10}}{E_0} < 1$$

$$\Rightarrow (1.1)^{10} > (1.06)^{10}\,\frac{E^e_{10}}{E_0}$$

⇒ nominal return from CDN bonds in CDN \$ > nominal return from US bonds in CDN \$

It is thus better to buy Canadian bonds.