$r = i - \pi$

Dalton Rothenberger ECON HW 1

$r_{a-t} = (1-t)i - \pi^e$

1 $r_{a-t} = (1-.3)5 - 2 = \boxed{1.5\%}$

2 $r_{a-t} = (1-.2)5 - 2 = \boxed{2\%}$

Gross & Net Investment

3 $K_{t+1} = \$15$ million $K_t = \$10$ million $d = .2$

$K_{t+1} - K_t = I_t - dK_t$

$15 - 10 = I_t - (.2)(10)$

$5 = I_t - 2$

$\boxed{\$7 \text{ million} = I_t}$

4 a) $K_t = 5{,}000$ billion, $I_t = 1{,}250$ billion, $d = 10\%$ b) $K_t = 5{,}000$ billion, $I_t = 750$ billion, $d = 5\%$

$I_t - dK_t = 1250 - (0.1 \cdot 5000)$ $I_t - dK_t = 750 - (0.05 \cdot 5000)$

$\boxed{= \$750 \text{ billion}}$ $\boxed{= \$500 \text{ billion}}$

Tobin's q ($q = \frac{V}{P_K K}$)

5 $V = \$8$ million $P_K K = \$12$ million

$q = \frac{8}{12} = \frac{2}{3} = 0.666$

Should not invest because $0.75 < 1$ so Tobin's q tells us not to invest.

Means $V < P_K K$

Investment & Stock market ($uc = (r+d)P_K$)

6 $P_K = \$10{,}000$ $d = 10\%$ $i = 6\%$ $\pi = 3\%$ $r = 6-3$

$uc = (0.03 + 0.1)\,10{,}000$ $r = 3\%$

$\boxed{uc = \$1{,}300}$

7 $P_K = \$5{,}000$ $d = 25\%$ $r = 5\%$ tax $= 25\%$

$uc = (0.25 + 0.05)5000 \,/\, (1 - 0.25)$

$\boxed{uc = \$2{,}000}$

Present & future value

8 FV = $10,000 $i = 5\%$ $n = 30$

$PV = \frac{FV}{(1+i)^n} = \frac{10000}{(1+0.05)^{30}}$ $= \$2,313.77$

9 $PV = 1,000,000$ $i = 10\%$ $n = 10$

$PV = \frac{FV}{(1+i)^n} \rightarrow PV(1+i)^n = FV$

$1,000,000(1+0.1)^{10} = FV$

$\$2,593,742.46 = FV$

Present Value & Budget Constraint ($PVLC = C + \frac{C^f}{1+r}$)

10 $C = 140$ $C^f = 210$ $r = 5\%$

$PVLC = 140 + \frac{210}{(1+0.05)}$

$= 140 + 200$

$= 340$

11 $C = 140$ $C^f = 220$ $PVLC = 340$

$PVLC = C + \frac{C^f}{1+r}$

$340 = 140 + \frac{220}{1+r}$

$200 = \frac{220}{1+r}$

$1+r = \frac{220}{200}$

$r = 1.1 - 1$

$r = 0.1$ $r = 10\%$