

Assignment1 - Answer Key

1. There was a typo in this question. It was intended that: $Y = 1000$. If you did the question with $Y = 100$, you should get the answers that appear in parentheses.

a) $S = Y + NFP + -C - G$. $S = 250$. ($S = -650$).

b) $S_p = Y + NFP + TR + INT - T - C = PDI - C = 100$.

c) $NGI = T - TR - INT$. $Y + NFP + TR + INT - T - C = PDI$. $T = 5$. ($T = 905$). $NGI = 250$. ($NGI = 1150$).

d) $NX + Y - C - I - G$. $NX = 120$. ($NX = -780$).

2. a) Expected after-tax real-interest rate = $i(1 - t) - \pi^e = 1\%$.

b) Expected after-tax real-interest rate = $(r + \pi^e)(1 - t) - \pi^e = 1\%$.

c) The nominal bond's return was: $i(1 - t) - \pi = 2\%$. The real return bond's return was: $(r + \pi)(1 - t) - \pi = 1.5\%$.

3. a) $Y_m = 64N_m^{0.5}$. We equate $MPN = w$: $\frac{\partial Y}{\partial N_m} = \frac{32}{N_m^{0.5}} = w$. $w = 4$.

$Y_a = 40N_a^{0.5}$. We equate $MPN = w$: $\frac{\partial Y}{\partial N_a} = \frac{20}{N_a^{0.5}} = w$. $w = 2$.

b) In equilibrium $MPN = w$. Workers will stop switching sectors when: $MPN_a = MPN_m$ (i.e. the wage in both sectors will be the same). We can then get rid of one unknown (either N_a or N_m) with the total labour supply equation: $N_a + N_m = 164$. Solving we get: $N_m = 117.93$. $N_a = 46.06$. $w = 2.95$.

c) The solution concept is the same but we need to equate after-tax wages this time: $w_a = (1 - t)w_m$. Hence: $MPN_a = 0.75MPN_m$. $N_a + N_m = 164$. $N_m = 96.79$. $N_a = 67.21$. $w_m = 3.25$. $w_a = 2.44$.

4. a) The government budget constraint is: $D + G_1 + \frac{G_2}{1+r} = 500 = T_1 + \frac{T_2}{1+r}$. The individuals budget constraint is: $C + \frac{C}{1+r} = Y_1 - T_1 + \frac{(Y_2 - T_2)}{1+r}$. Substituting $T_1 + \frac{T_2}{1+r} = 500$ and solving we get: $\frac{2.1C}{1.1} = 1600$. $C = 838.10$.

b) The time at which the debt is repaid doesn't matter when Ricardian equivalence holds. Private saving compensate for government saving. $S_1 = Y - C - G = -38.1$. $S_2 = 1.1 \cdot 38.1 = 41.91$.

c) Consumption will decrease as individuals are borrowers.

5. a) $MPK^f = \frac{24}{T} = (0.05 + 0.06 + 0.01)100$. $T = 4$.

b) $3600 = (0.05 + 0.07)p_k$. $p_k = 30000$.

6. a) $S^{USA} = I^{USA}$ and $r^{USA} = 5\%$. $S^{JAP} = I^{JAP}$ and $r^{JAP} = 1.5\%$.

b) $S^{USA} + S^{JAP} = I^{USA} + I^{JAP}$ and $r^w = 3.25$. $CA^{USA} = S^{USA} - I^{USA} = -35$.
 $CA^{JAP} = 35$.

c) $G_US \downarrow \rightarrow S_{us} \uparrow \rightarrow r_W \downarrow \rightarrow I^{US} \uparrow, I_{JAP} \uparrow, S_{JAP} \downarrow$.