Exam Fall 2020

IIA

$m^D = Y/4i$ $Y = 100$ $i^* = 0,1$ $P^* = 1$

a) $M^S = 250$

a1) $i = i^* = 0,1$ $m^D = Y/4i = \frac{100}{4 \times 0,1} = 250$ $M/P = m^D \Leftrightarrow P = M/m^D = \frac{250}{250} = 1$

PPP: $E^e = P/P^* = 1/1 = 1$ UIP: $i = i^* + \frac{E^e}{e} - 1 \Leftrightarrow e = \frac{E^e}{i - i^* + 1} = \frac{1}{0,1 - 0,1 + 1} = 1$

b) $M^{s'} = 80$ (permanent)

b1) In the LR $e = E^e$, such that $i = i^* = 0,1$.

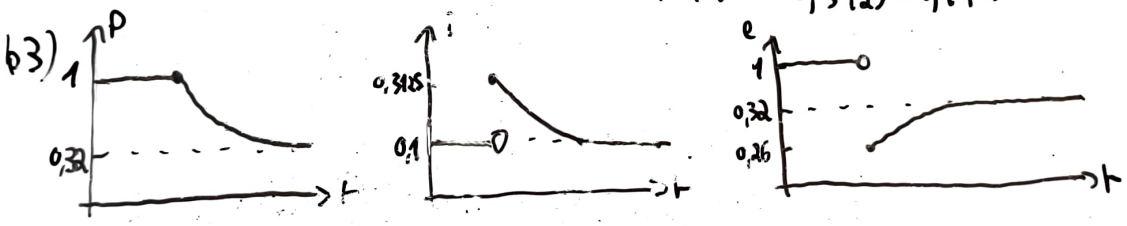
SR: $\bar{P} = 1 \wedge Y = 100$: $m^D = M'/\bar{P} \Leftrightarrow Y/4i = \frac{80}{1} \Leftrightarrow \frac{100}{4i} = 80 \Leftrightarrow 4i = \frac{100}{80}$

$\Rightarrow i = 0,3125$

b2) LR: $m^D = 250 \Rightarrow P = M/m^D = \frac{80}{250} = 0,32$ $E^e = P/P^* = 0,32$

SR: UIP $i = i^* + \frac{E^e}{e} - 1 \Leftrightarrow e = \frac{E^e}{i - i^* + 1} = \frac{0,32}{0,3125 - 0,1 + 1} \simeq 0,264$

b3)



IIB $P = 1$ $i^* = 0,1$ $m^D = 0,1Y - 10i$ $M = 18$ $Y_F = 190$ $Y = S(\bar{A} + TB)$ $\bar{A} = 40$

$TB = 4(e/P - 3,5)$ $Y' = 180$

a)

a1) $Y = S(\bar{A} + TB) \Leftrightarrow Y = S(40 + 4(e/P - 3,5)) = S(40 + 4(e/1 - 3,5))$

$\Leftrightarrow Y = S(40 + 4e - 14) = 130 + 20e$

a2) $Y = 180$: $m^D = M/P \Leftrightarrow 0,1Y - 10i = 18/1 \Leftrightarrow 0,1 \times 18 - 10i = 18 \Rightarrow i = 0$

a3) Using the DD curve: $180 = 130 + 20e \Leftrightarrow 20e = 50 \Rightarrow e = 2,5$

a4) UIP: $i = i^* + E^e/e - 1 \Leftrightarrow E^e/e = i - i^* + 1 \Leftrightarrow E^e = (i - i^* + 1)e = 2,25$

a5) $m^D = M/P \Leftrightarrow 0,1Y - 10i = 18 \Leftrightarrow 10i = 0,1Y - 18 \Leftrightarrow i = 0,01Y - 1,8$

$i = 0 \Leftrightarrow 0,01Y - 1,8 = 0 \Leftrightarrow 0,01Y = 1,8 \Leftrightarrow Y = 180$

$0{,}1Y - 10i = 18 \Leftrightarrow 0{,}1Y = 18 + 10i \Leftrightarrow Y = 180 + 100i$

q) $\begin{cases} Y = 180 + 100i, & \text{for } i > 0 \\ Y \leq 180, & \text{for } i = 0 \end{cases}$

$Y = 180 + 100\left(i^* + \frac{E^e}{e} - 1\right) = 180 + 100\left(0{,}1 + \frac{2{,}25}{e} - 1\right) = 90 + \frac{225}{e}$

$Y = 90 + \frac{225}{e} \Leftrightarrow \frac{225}{e} = Y - 90 \Leftrightarrow \frac{e}{225} = \frac{1}{Y-90} \Leftrightarrow e = \frac{225}{Y-90}$

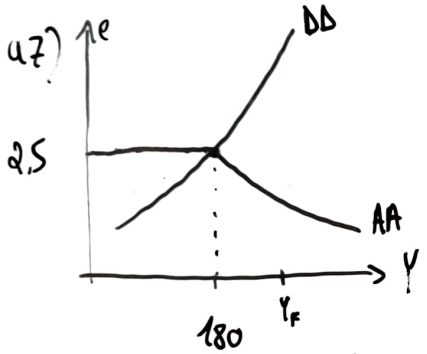
If $Y = 180$: $e = \frac{225}{180-90} = 2{,}5$

u6) $TB = 4\left(\frac{e}{P} - 3{,}5\right) = 4\left(\frac{2{,}5}{1} - 3{,}5\right) = -4$

We have a trade balance deficit.

AA: $\begin{cases} Y = 90 + \frac{225}{e}, & \text{for } e < 2{,}5 \\ Y \leq 180, & \text{for } e = 2{,}5 \end{cases}$

u7)



b) We want to achieve internal balance, such that: $Y = Y_F = 190$

Using the DD curve: $Y_F = 130 + 20e \Leftrightarrow 190 = 130 + 20e \Leftrightarrow 20e = 60$

$\Rightarrow e = 3$. UIP: $i = i^* + \frac{E^e}{e} - 1 = 0{,}1 + \frac{2{,}25}{3} - 1 = -0{,}15$

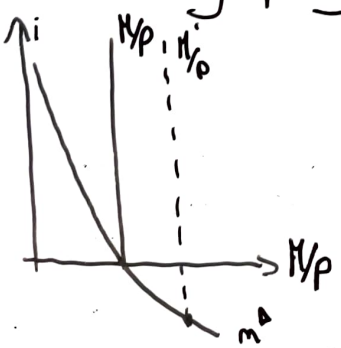
The interest rate cannot fall below 0, we are in a zero-lower bound and monetary policy cannot affect output.

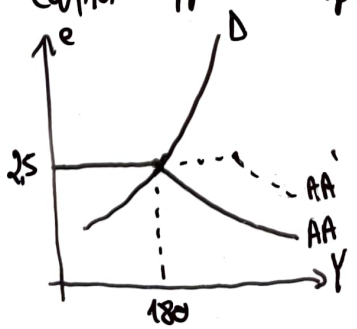
External balance: $TB = 0$

$\Leftrightarrow 4\left(\frac{e}{P} - 3{,}5\right) = 0 \Leftrightarrow 4e = 14$

$\Leftrightarrow e = 3{,}5$

If $e = 3{,}5$: $i \simeq -0{,}26$ Same problem.





c) Using the AA curve: $Y_F = 90 + \frac{225}{e} \Leftrightarrow 190 = 90 + \frac{225}{e} \Leftrightarrow e = 2{,}25$

Output market eq: $Y_F = 5(\bar{A} + TB) \Leftrightarrow 190 = 5(\bar{A} + 4\left(\frac{e}{P} - 3{,}5\right))$

$\Leftrightarrow 190 = 5\bar{A} + 20\left(\frac{2,25}{1} - 3,5\right) \Leftrightarrow 5\bar{A} = 215 \Rightarrow \bar{A}' = 43$

A temporary fiscal expansion that $\uparrow \bar{A}$ to 43 can restore Y_F.

$TB = 4\left(\frac{e}{p} - 3,5\right) = 4\left(\frac{2,25}{1} - 3,5\right) = -5$ However, it worsens the TB deficit.

Our "initial" multiplier is 5, so $5 \times \Delta\bar{A} = 5 \times 3 = 15$, but 5 go to imports, such that output only ↑ by 10. So, we end up with a multiplier of: $\frac{\Delta Y}{\Delta \bar{A}} = \frac{10}{3} \approx 3,33$

d)

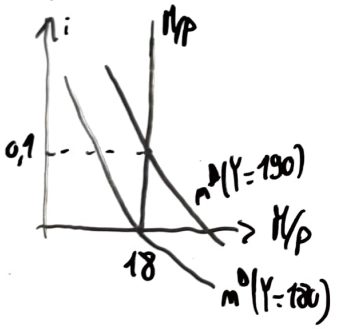
d1) Departing from DD: $Y_F = 130 + 20e \Leftrightarrow 190 = 130 + 20e \Leftrightarrow 20e = 60$

$\Rightarrow e = 3 \quad \bar{e} = E^e = 3$

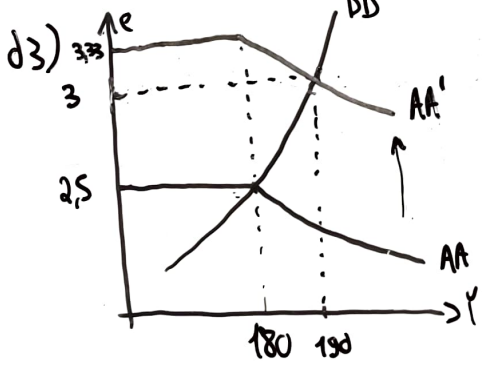
d2) In a fixed regime $E^e = \bar{e} = 3$, such that $i = i^* = 0,1$.

$\Rightarrow m^D = 0,1 Y_F - 10 i^* = 0,1 \times 190 - 10 \times 0,1 = 18$

$M/P = m^D \Leftrightarrow M = m^D \times P = 18 \times 1 = 18.$



d3)



$m^D = M/P \Leftrightarrow 0,1Y - 10i = 18 \Leftrightarrow 10i = 0,1Y - 18 \Rightarrow i = 0,01Y - 1,8$

$i = 0 \Leftrightarrow 0,01Y - 1,8 = 0 \Leftrightarrow 0,01Y = 1,8 \Rightarrow Y = 180$

$0,1Y - 10i = 18 \Leftrightarrow 0,1Y = 18 + 10i \Leftrightarrow Y = 180 + 100i$

$\begin{cases} Y = 180 + 100i, \text{ for } i > 0 \\ Y \leq 180, \text{ for } i = 0 \end{cases}$

$Y = 180 + 100\left(i^* + \frac{E^e}{e} - 1\right) = 180 + 100\left(0,1 + \frac{3}{e} - 1\right)$

$\Rightarrow Y = 90 + \frac{300}{e}$

If $Y = 180$: $180 = 90 + \frac{300}{e} \Leftrightarrow \frac{300}{e} = 90 \Leftrightarrow e \approx 3,33$

$\begin{cases} Y = 90 + \frac{300}{e}, \text{ for } e < 3,33 \\ Y \leq 180, \text{ for } e = 3,33 \end{cases}$ AA