

Problems for Lecture Notes (4): Dynamic models of real-financial interactions
 Sketch of solutions

(1) (a) Considering a risk premium on shares the no-arbitrage condition becomes

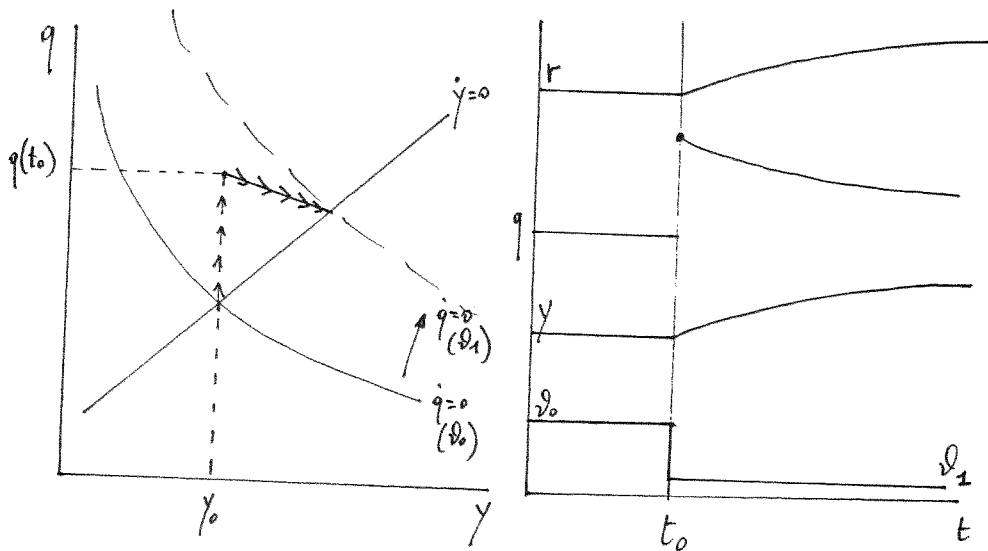
$$\frac{\pi(t)}{q(t)} + \frac{\dot{q}(t)}{q(t)} = r(t) + \vartheta$$

and the stationary curve for q becomes:

$$\dot{q}=0 \Rightarrow q = \frac{\pi}{r+\vartheta} = \frac{a_0 + a_1 Y}{\left(\frac{h_0}{h_2} + \frac{h_1}{h_2} - \frac{1}{h_2} \frac{w}{P}\right) + \vartheta}$$

$$\Rightarrow \frac{\partial q}{\partial \vartheta} \Big|_{\dot{q}=0} < 0 \quad (\text{when } \vartheta \text{ increases the } \dot{q}=0 \text{ locus shifts down})$$

(b) unexpected permanent reduction from ϑ_0 to $\vartheta_1 < \vartheta_0$



(2) (a) $\frac{dq}{dy} \Big|_{\dot{q}=0} = \frac{a_1 r - (a_0 + a_1 Y) \frac{h_1}{h_2}}{r^2} > 0 \Leftrightarrow a_1 > q \frac{h_1}{h_2}$

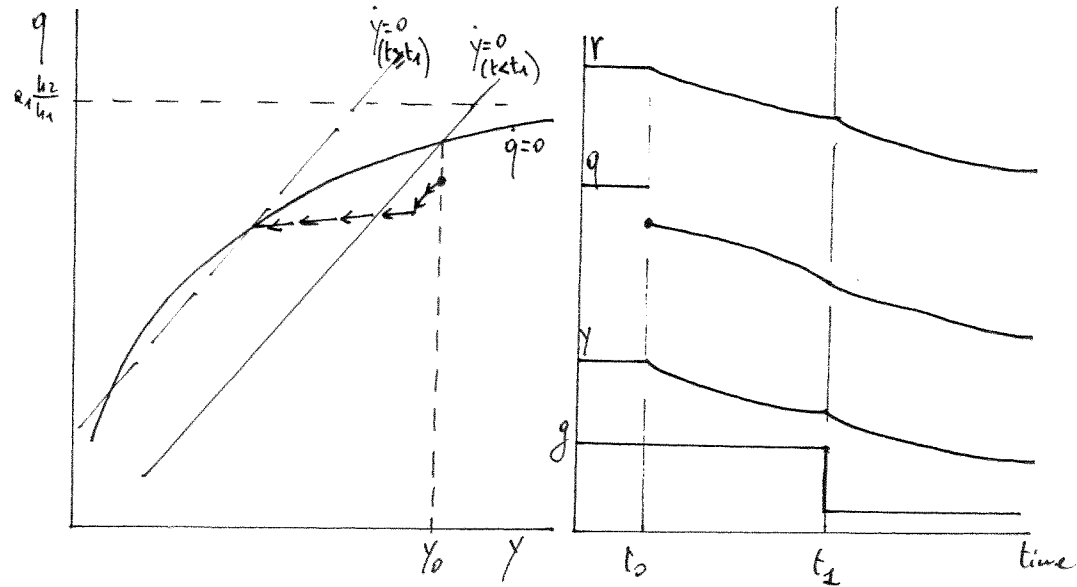
the $\dot{q}=0$ curve crosses the $\dot{y}=0$ locus "from above" (as in the picture below)

since $\lim_{y \rightarrow \infty} \frac{dq}{dy} \Big|_{\dot{q}=0} = 0$

and has an upper asymptote at $\frac{a_1 h_2}{h_1}$ for $y \rightarrow \infty$

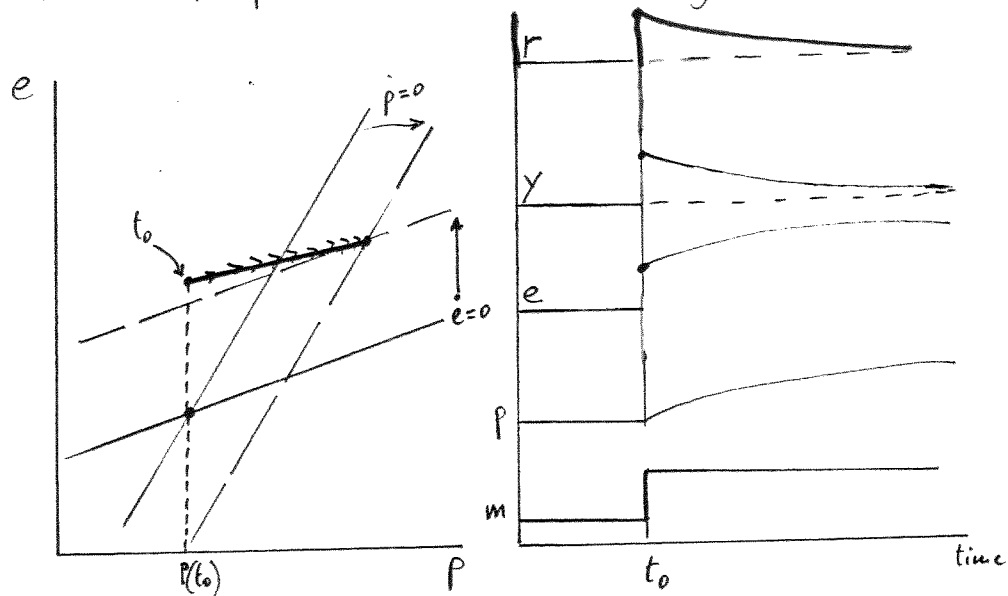
The "saddlepoint" properties of the model are preserved but the saddlepath is now upward-sloping.

(b) Future (announced at t_0) fiscal restriction (see Blanchard p.138 (1981))

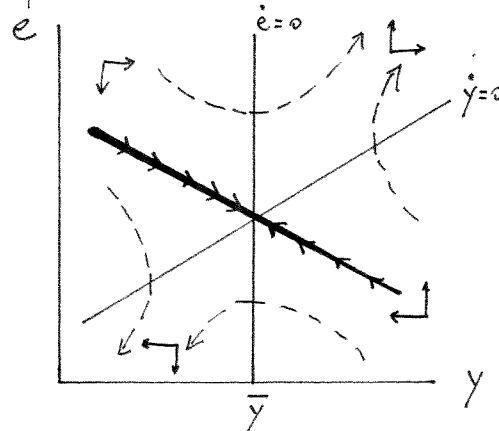


(3) (e) if $\beta > 1 \Rightarrow \frac{de}{dp} \Big|_{\dot{e}=0} > 0$ but < 1 (positively sloped but less steep than $\dot{p}=0$)

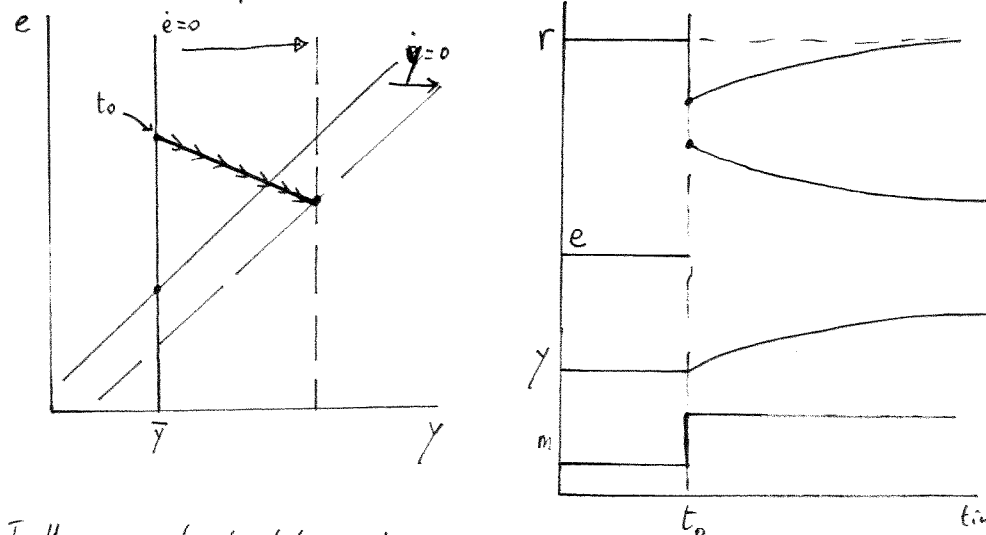
(b) monetary expansion \Rightarrow "no overshooting"



Complete dynamics



(b) monetary expansion

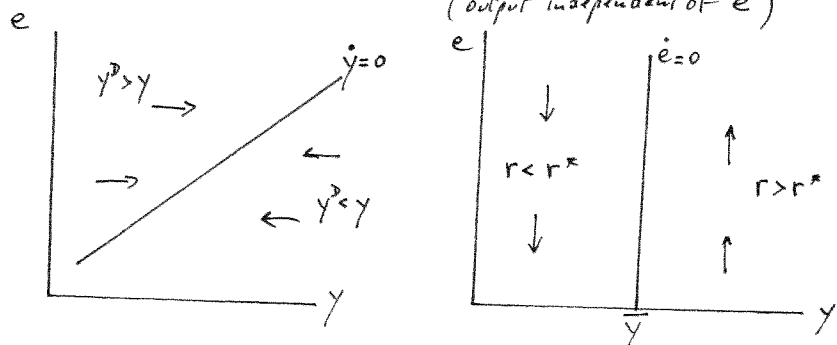


(4) (a) Stationary equations for y and e
 $\dot{y}=0 \Rightarrow y = y^D \Rightarrow y = -\alpha \left(\frac{1}{h} y - \frac{1}{h} (m - \bar{p}) \right) + \beta (e + p^* - \bar{p})$

$$\Rightarrow y = \frac{\beta}{\alpha + h} (e + p^* - \bar{p}) + \frac{\alpha}{\alpha + h} (m - \bar{p}) \Rightarrow \frac{de}{dy} \Big|_{\dot{y}=0} > 0$$

$$\dot{e}=0 \Rightarrow r = r^* \Rightarrow m - \bar{p} = y - h r^* \Rightarrow y = m - \bar{p} + h r^* \equiv \bar{y}$$

(output independent of e)



In the new steady-state equilibrium output and the exchange rate are higher. (e must depreciate to generate the additional aggregate demand for goods needed to match higher output in the steady state).

From t_0 the domestic interest rate is increasing because money demand is increasing (due to the increase in output); the interest rate differential in favor of foreign assets ($r < r^*$) is gradually eliminated.

Along the adjustment an exchange rate appreciation is necessary to restore the no arbitrage (covered interest rate parity) condition with $r = r^*$.