

Max $u_1 = c_1 \cdot c_1'$ S_1

sa $c_1 + l_1 + p b_1 = 1$

$c_1' = R l_1 + b_1$

$c_1 + \frac{c_1'}{R} = 1 - p b_1 + \frac{b_1}{R}$

$c_1 + \frac{c_1'}{R} = 1 + b_1 \left[\frac{1}{R} - p \right]$ $Rp=1$

$c_1 = l_1$

$l_1 + p b_1 = \frac{1}{2}$ ①

Max $u_2 = c_2 \cdot h'$

sa $c_2 + l_2 + p b_2 = 2$

$c_2' = 2 + R l_2 + b_2$

$c_2 + \frac{c_2'}{R} = 2 + \frac{2}{R} + b_2 \left[\frac{1}{R} - p \right]$

$c_2 = 2 + \frac{1}{R}$

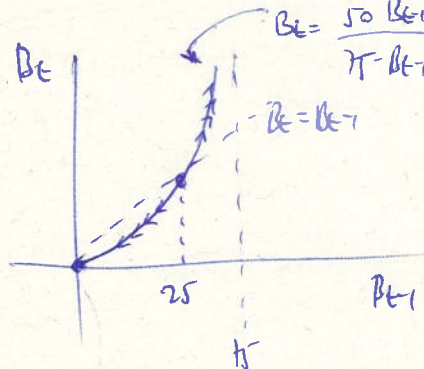
$l_2 + p b_2 = 2 - c_2 = 1 - \frac{1}{R}$ ②

S_2

$\frac{dA}{dB} = \frac{50(75 - B_{t-1}) + 10B_{t-1}}{(75 - B_{t-1})^2} = \frac{3750}{(75 - B_{t-1})^2} > 0$

$\frac{d^2A}{dB^2} = \frac{3750 \cdot 2(75 - B_{t-1})}{(75 - B_{t-1})^3} = \frac{7500}{(75 - B_{t-1})^3} > 0$

$4 \text{ si } 75 > B_{t-1}$



$B_t = B_{t-1} = B \rightarrow 75B - B^2 = 50B$

$B_t = \frac{50 B_{t-1}}{75 - B_{t-1}}$

$25 = B$

$B = 0$

$B = 25 \rightarrow R = \frac{50}{75 - 25} = 1 \rightarrow p = \frac{1}{R} = 1$

3 equations & 4 inequalities

refinancament del deute

$\sum S_i = \sum l_i + p b_i = \sum l_i + p \sum b_i = 0 + p \cdot B = B - 1$

$50(l_1 + l_2) = 25 + 50 - \frac{50}{R} = 75 - \frac{50}{R}$

$75 - \frac{50}{R} = B - 1$

~~$B = 25$~~

$75 - B - 1 = \frac{50}{R}$

$R = \frac{50}{75 - B - 1}$

market clearing

- sup 1 $l_1 + p b_1 = \frac{1}{2} \rightarrow$ ① $l_1 + b_1 = \frac{1}{2}$
- sup 2 $l_2 + p b_2 = 1 - \frac{1}{R} \rightarrow$ ② $l_2 + b_2 = 0$
- eq. market profits $50(l_1 + l_2) = 0 \rightarrow$ ③ $l_1 + l_2 = 0$
- eq. market bonds $50(b_1 + b_2) = B = 25 \rightarrow$ ④ $b_1 + b_2 = \frac{1}{2}$

① + ③ + ④ \Rightarrow ①

④ $\rightarrow b_2 = 25 - b_1$

③ $\rightarrow l_2 = -l_1$

② $\rightarrow l_1 = -b_1$

$-l_1 = b_1$

$l_1 = b_2$

④ $b_1 + b_2 = \frac{1}{2}$

① $b_1 + l_1 = \frac{1}{2}$

$c_1 + c_2 + c_1' + c_2' = 5$ $c_1' = R c_1$ $c_2' = R c_2$

$c_1(1+R) + c_2(1+R) = 5 \rightarrow \left(\frac{1}{2} + 1 + \frac{1}{R}\right)(1+R) = 5$

$(c_1 + c_2)(1+R) = 5 \rightarrow \frac{3}{2} + \frac{1}{R} + \frac{3}{2}R + 1 = 5$

$\frac{1}{2} + \frac{3}{2}R - \frac{5}{2} = 0 \rightarrow 2 + 3R^2 - 5R = 0 \rightarrow \begin{cases} R=1 \\ R=2/3 \end{cases}$