Discussion of

"Deficits and Inflation: HANK meets FTPL"

Angeletos, Lian, & Wolf

SF Fed Macro & Monetary Conference

Manuel Amador

Feb 2025

PERPETUAL YOUTH + NK

$$\dot{b} = rb - T_t \quad \text{// } b\text{: real debt, Sequential BC}$$

$$r = i_t - \pi \quad \text{// Fisher Eq.}$$

$$\dot{\pi} = \hat{\rho}\pi + \kappa(C^* - C) \quad \text{// NKPC}$$

$$\dot{C} = (r-\rho)C - \mu b \quad \text{// Blanchard-Yaari perpetual youth "Euler" eqn}$$

$\{i_t, T_t\}$ policy instruments ‖ Eqm also requires transversality conditions

COUPLE OF OBSERVATIONS

- Bonds are net wealth if $\mu > 0$
- (π, c) consistent with same NKPC independent of μ
- RA vs Perpetual Youth

  Only "Euler" equation is different

NO INFLATION CASE

- NKPC: $\kappa = 0$; $\pi = 0$ // Prices are fixed
- Fiscal Policy:

$$\dot{b} = rb - \tau \cdot c$$

proportional tax

- Monetary Policy:

Controls real rate

RA

Monetary Policy: Sets $r = \rho$

$$\dot{c} = \cancel{(r-\rho)}^{\,0}\, c = 0$$

$$\dot{b} = rb - \tau c$$

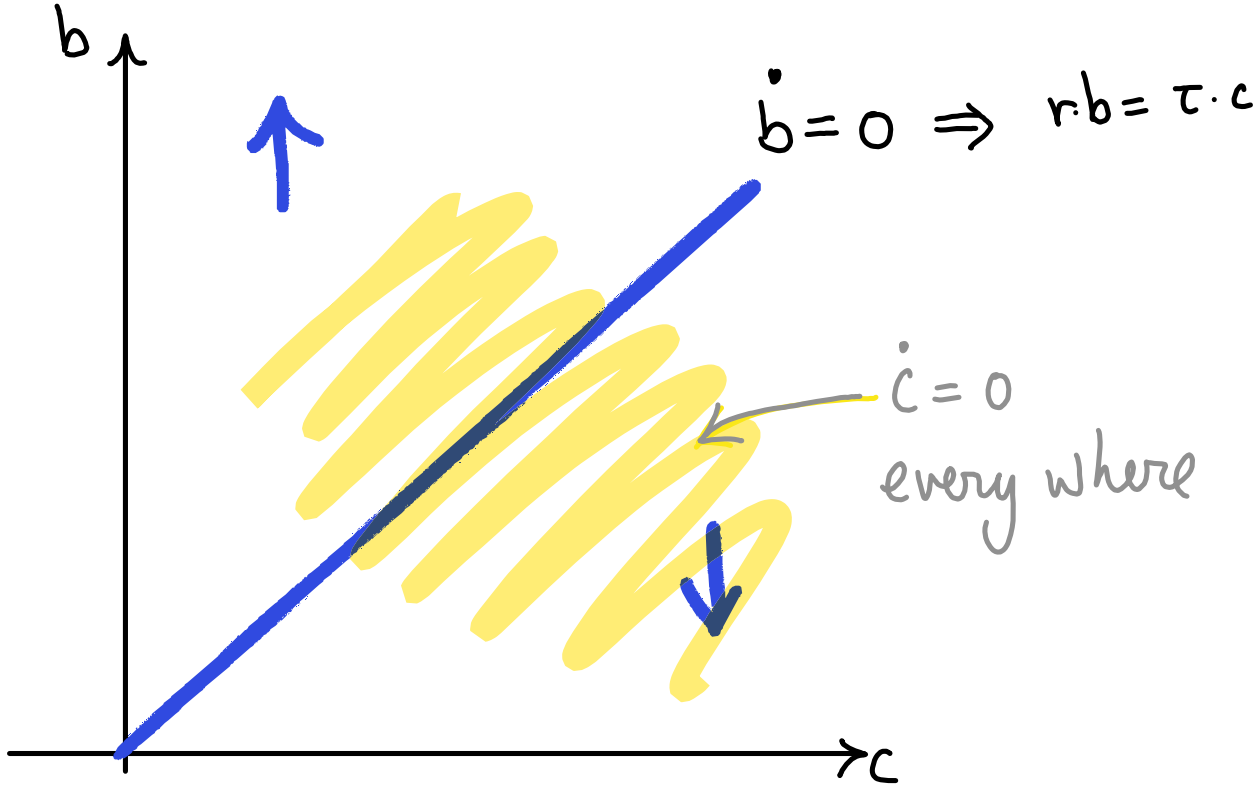
} System in (c, b)

RA

Monetary Policy : sets $r = \rho$

$$\dot{c} = \cancel{(r-\rho)}^{0} c = 0$$
$$\dot{b} = rb - \tau c$$

} System in (c, b)

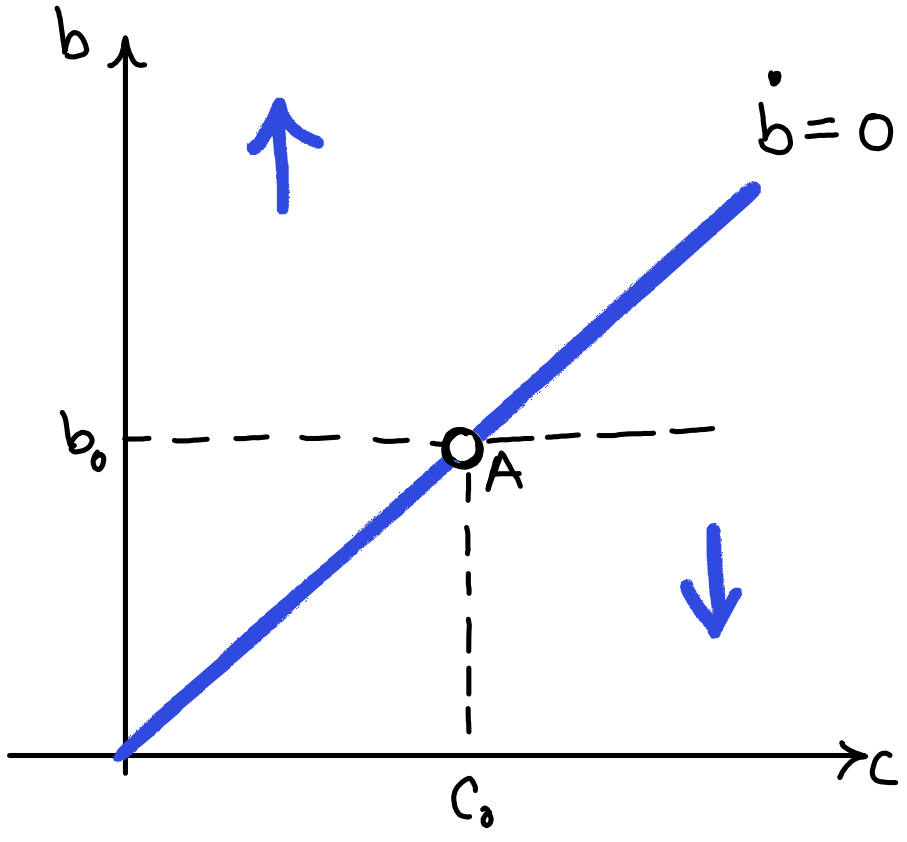


RA

Monetary Policy: Sets $r = \rho$

$$\dot{c} = (r - \rho)\, c = 0 \quad \text{(} r - \rho \to 0 \text{)}$$
$$\dot{b} = r\, b - \tau\, c$$

} System in (c, b)



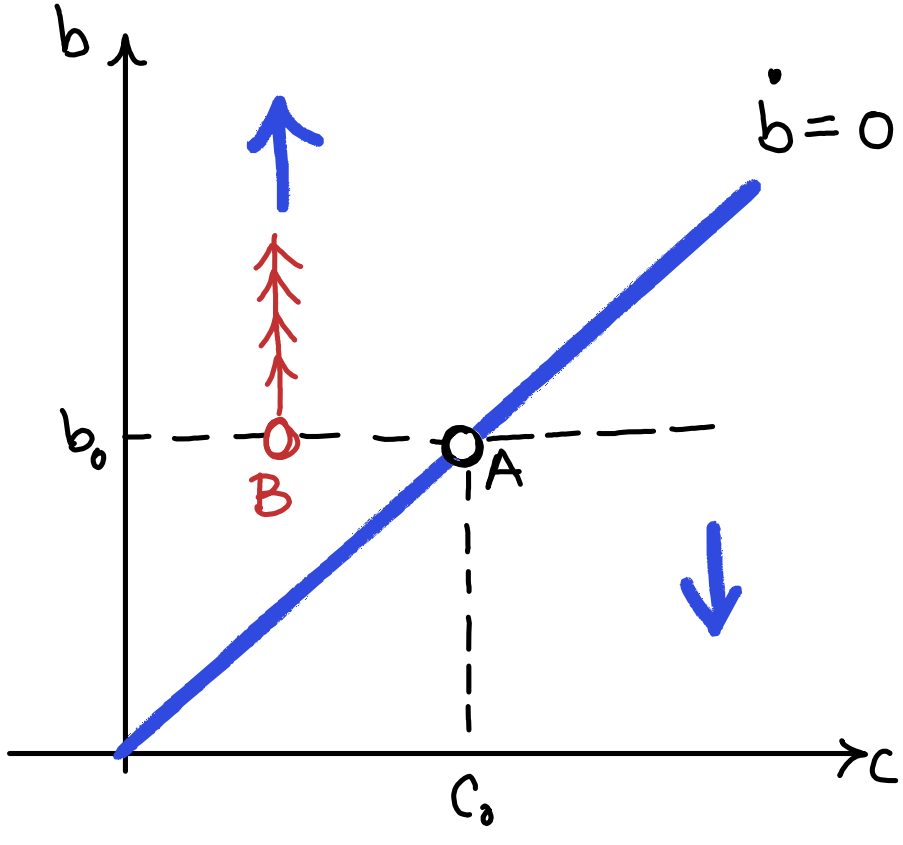
"A" is a valid eqm.

RA

Monetary Policy: Sets $r = \rho$

$$\dot{c} = (r - \rho)c = 0 \quad \text{(with } r - \rho \to 0\text{)}$$
$$\dot{b} = rb - \tau c$$

} System in (c, b)



"A" is a valid eqm.

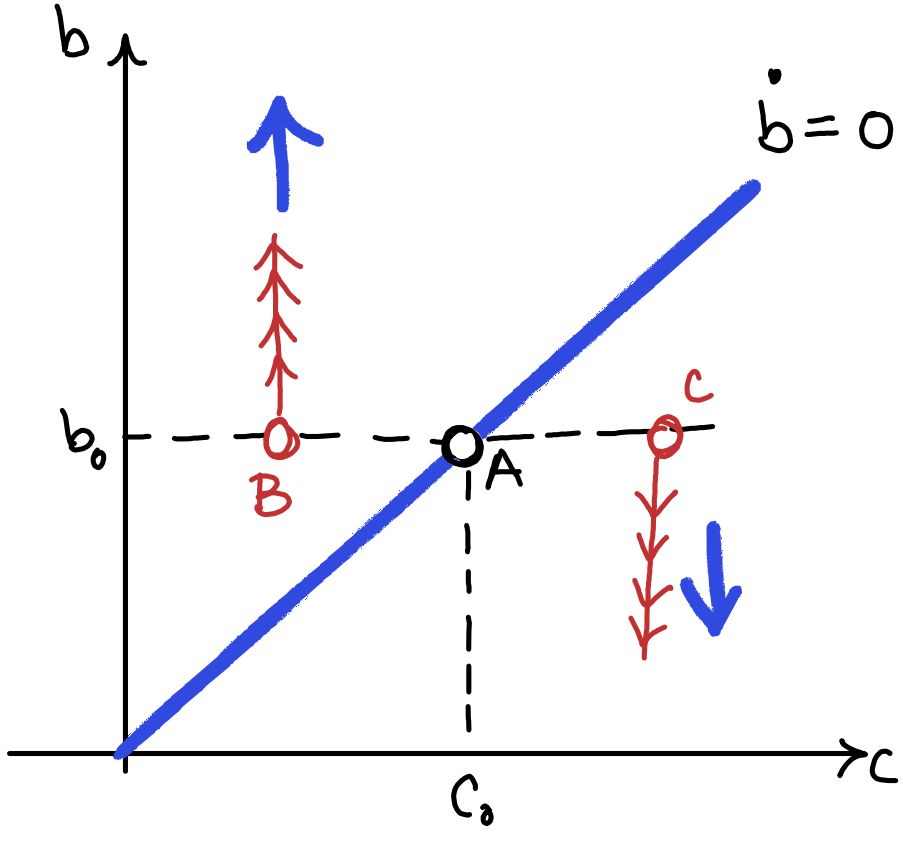
"B" is not: b blows up

RA

Monetary Policy: sets $r = \rho$

$$\dot{c} = (r - \rho)c = 0 \quad (r - \rho \to 0)$$
$$\dot{b} = rb - \tau c$$

} System in (c, b)



"A" is a valid eqm.

"B" is not, b blows up

"C" is not...

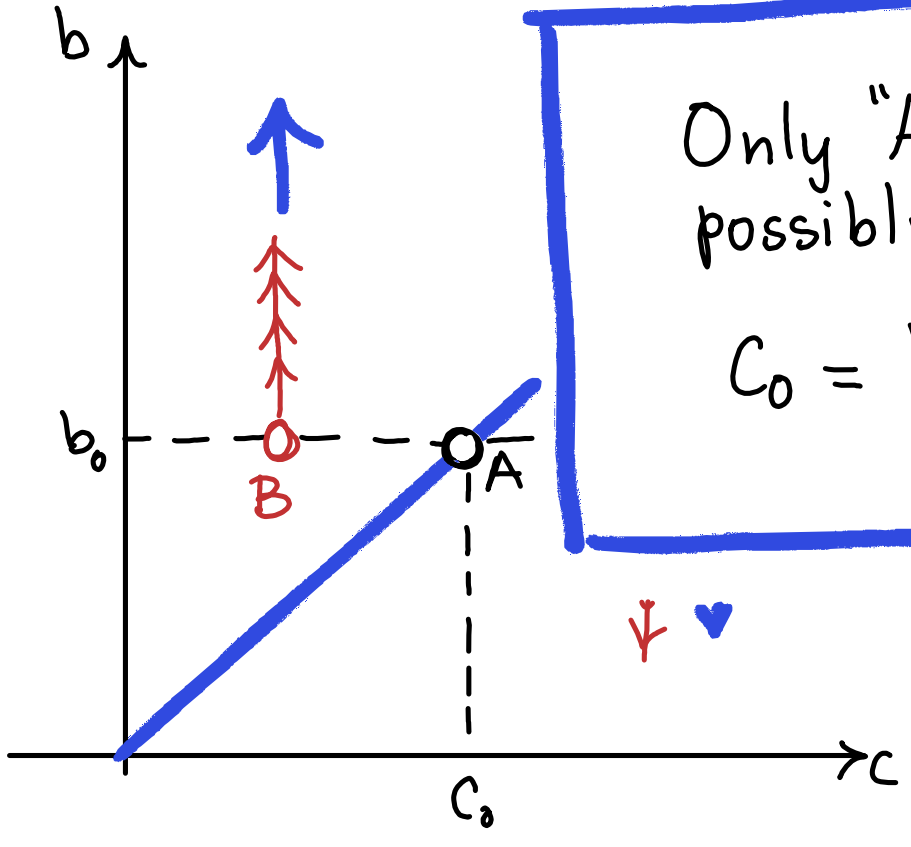
RA

Monetary Policy : sets $r = \rho$

$$\dot{c} = \cancel{(r-\rho)}^{0} c = 0$$

$$\dot{b} = rb - \tau c$$

} System in (c, b)



Only "A" is possible

$$c_0 = \frac{r\, b_0}{\tau}$$

valid

>t,

. up

>t...

Fiscal Policy determines C

PERPETUAL YOUTH

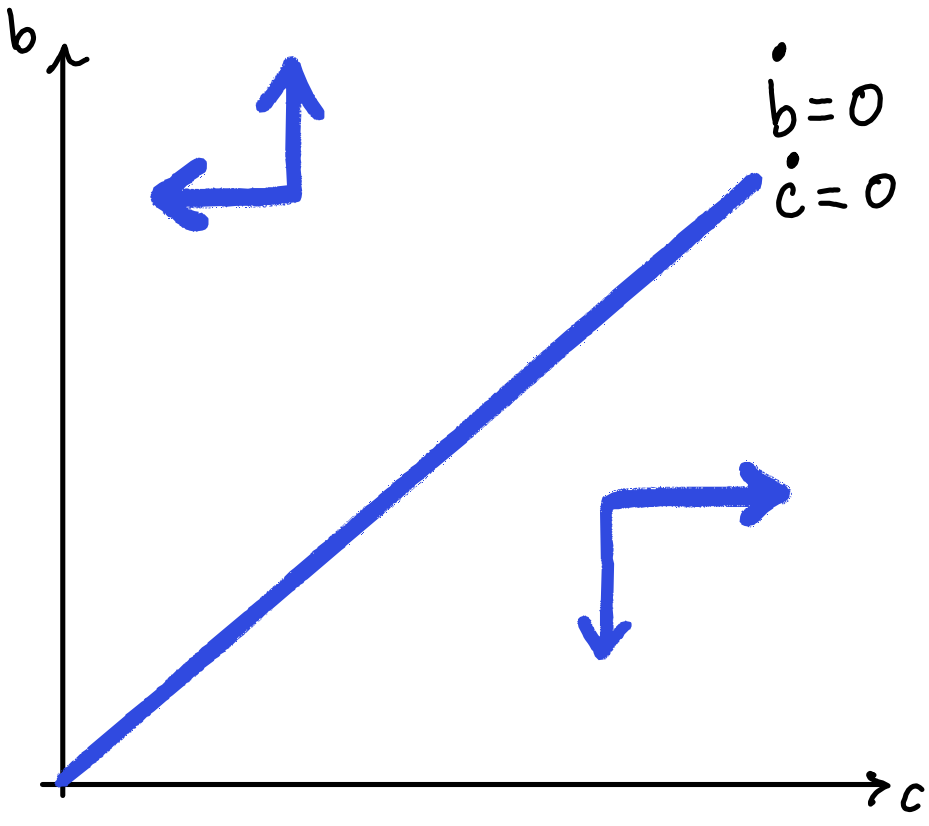
$$\dot{c} = (r-\rho)c - \mu b$$
$$\dot{b} = rb - \tau c$$

Monetary Policy: $\frac{r-\rho}{\mu} = \frac{\tau}{r}$

PERPETUAL YOUTH

$$\dot{c} = (r-\rho)c - \mu b \quad \| \quad \text{Monetary Policy}: \quad \frac{r-\rho}{\mu} = \frac{\tau}{r}$$

$$\dot{b} = rb - \tau c$$

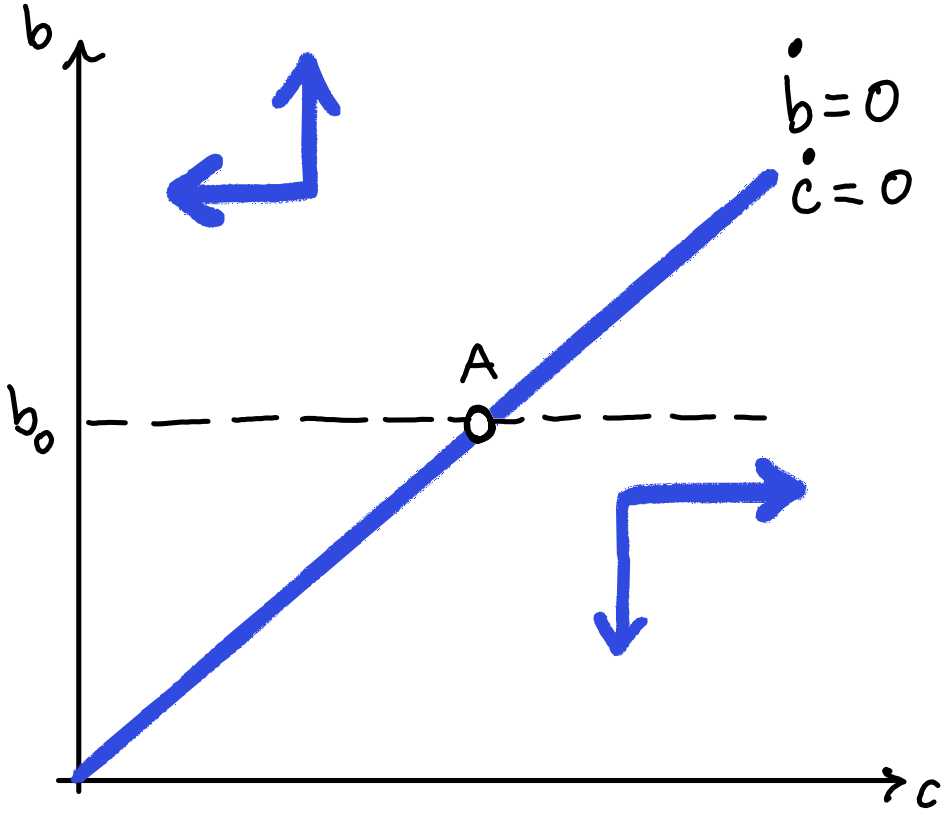


PERPETUAL YOUTH

$\dot{c} = (r-\rho)c - \mu b$

$\dot{b} = rb - \tau c$

Monetary Policy : $\frac{r-\rho}{\mu} = \frac{\tau}{r}$

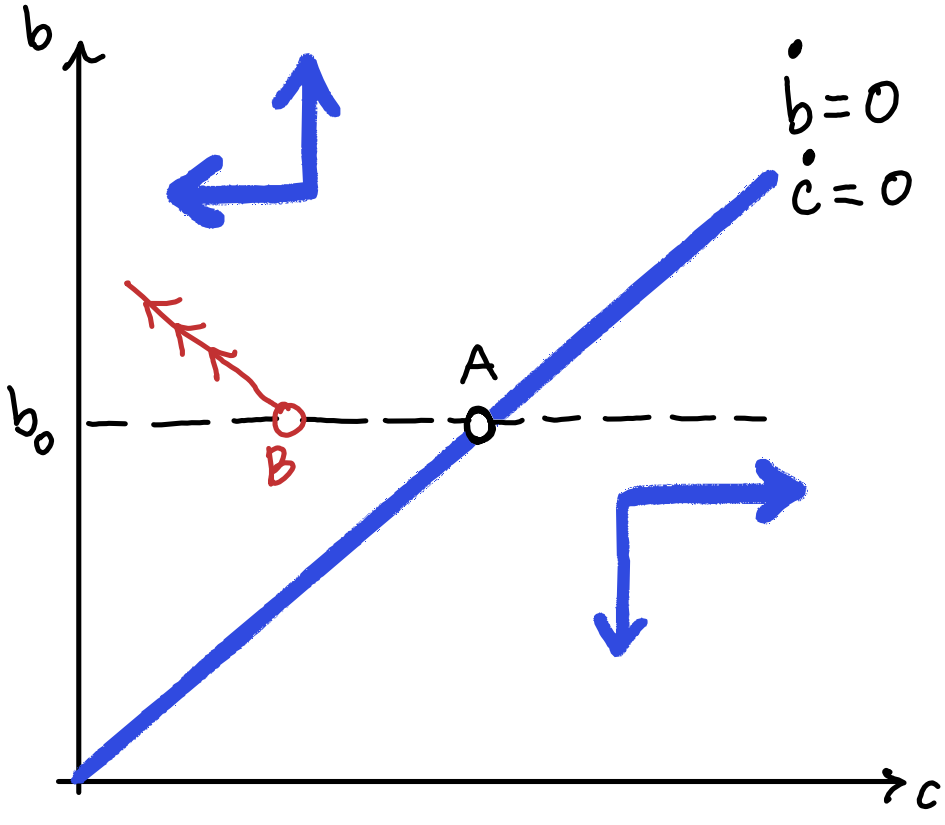


"A" is an eqm.

PERPETUAL YOUTH

$$\dot{c} = (r-\rho)c - \mu b \quad \| \quad \dot{b} = rb - \tau c$$

Monetary Policy: $\frac{r-\rho}{\mu} = \frac{\tau}{r}$



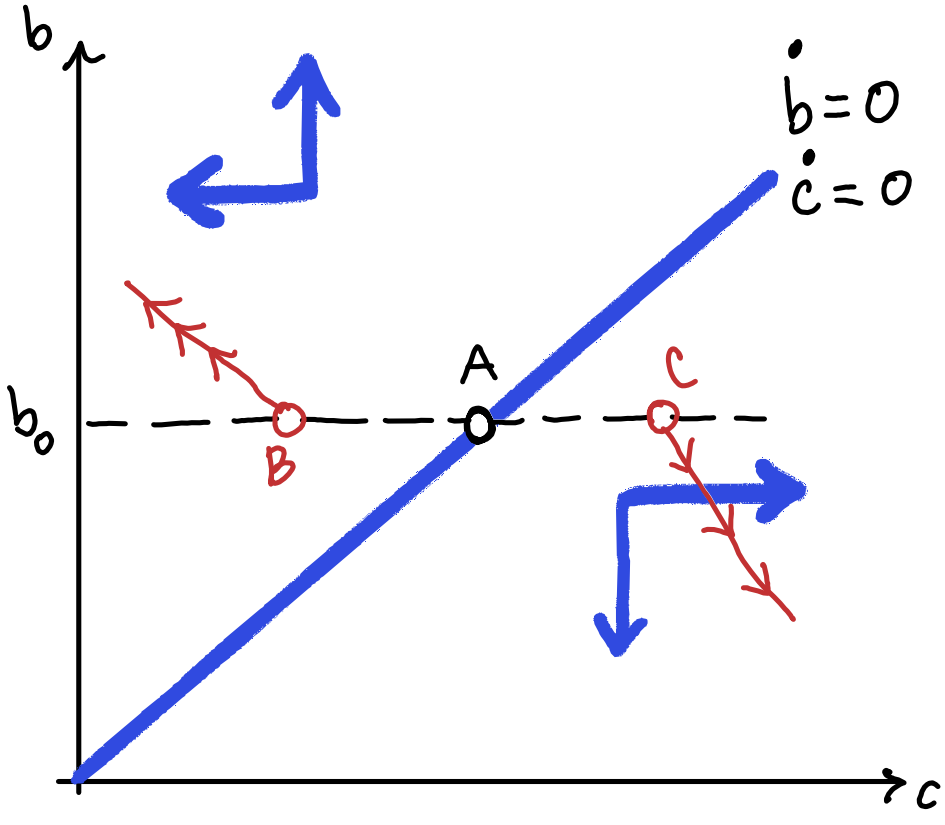
"A" is an eqm.

"B" is not
b & c blow up

PERPETUAL YOUTH

$$\dot{c} = (r-\rho)c - \mu b \quad \| \quad \text{Monetary Policy}: \quad \frac{r-\rho}{\mu} = \frac{\tau}{r}$$

$$\dot{b} = rb - \tau c$$



"A" is an eqm.

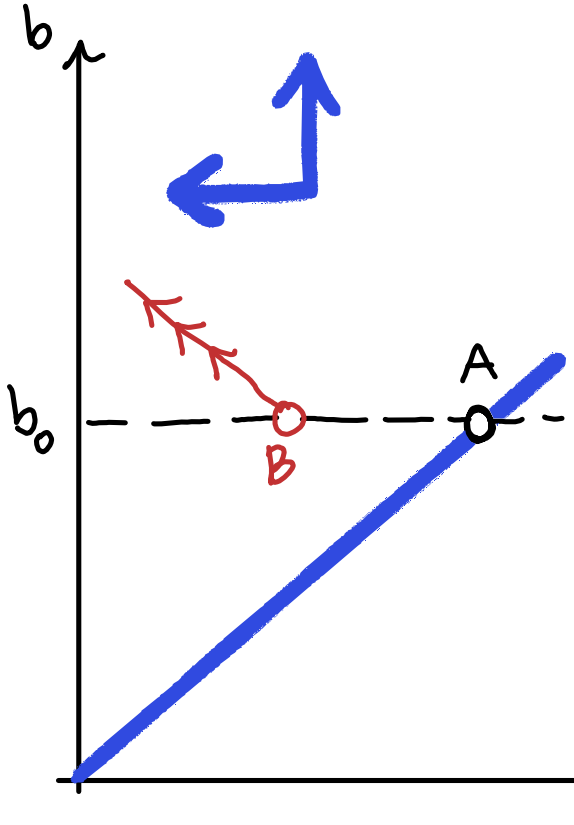
"B" is not
b & c blow up

"C" is not...

PERPETUAL YOUTH

$$\dot{c} = (r-\rho)c - \mu b \quad \| \quad \dot{b} = rb - \tau c$$

Monetary Policy: $\frac{r-\rho}{\mu} = \frac{\tau}{r}$



Only "A" is eqm

$$c_0 = \frac{r\,b_0}{\tau}$$

Same as RA

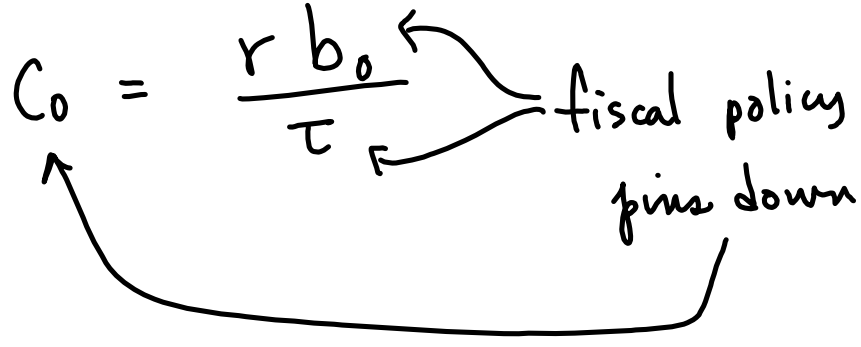
eqm.
t
v up
..

↓

Fiscal Policy determines c.

THE "HOW"

- RA & Perpetual Youth → Same determinacy



THE "HOW"

- RA & Perpetual Youth → Same determinacy
- But the "how" is different

In my view, major insight
it bypasses discussions
about determinacy

THE "HOW"

- RA & Perpetual Youth → Same determinacy
- But the "how" is different

- Consider alternative fiscal policy

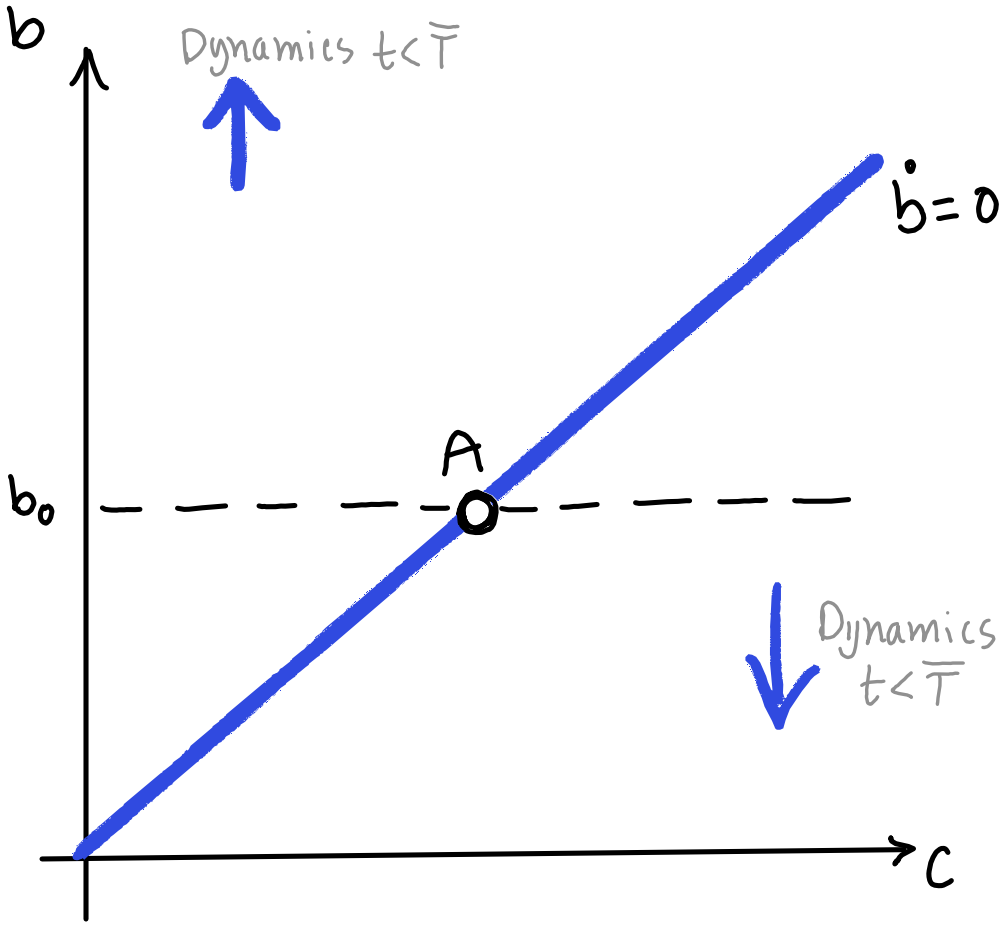
$$T_t = \begin{cases} \tau \cdot C & \text{for } t < \bar{T} \\ r \cdot b & \text{for } t \geq \bar{T} \end{cases}$$

After $\bar{T}$, debt is stabilized.

RA

$$\dot{c} = (r - \rho)\, c = 0 \quad (\rho = r)$$

$$\dot{b} = r\, b - T_t$$

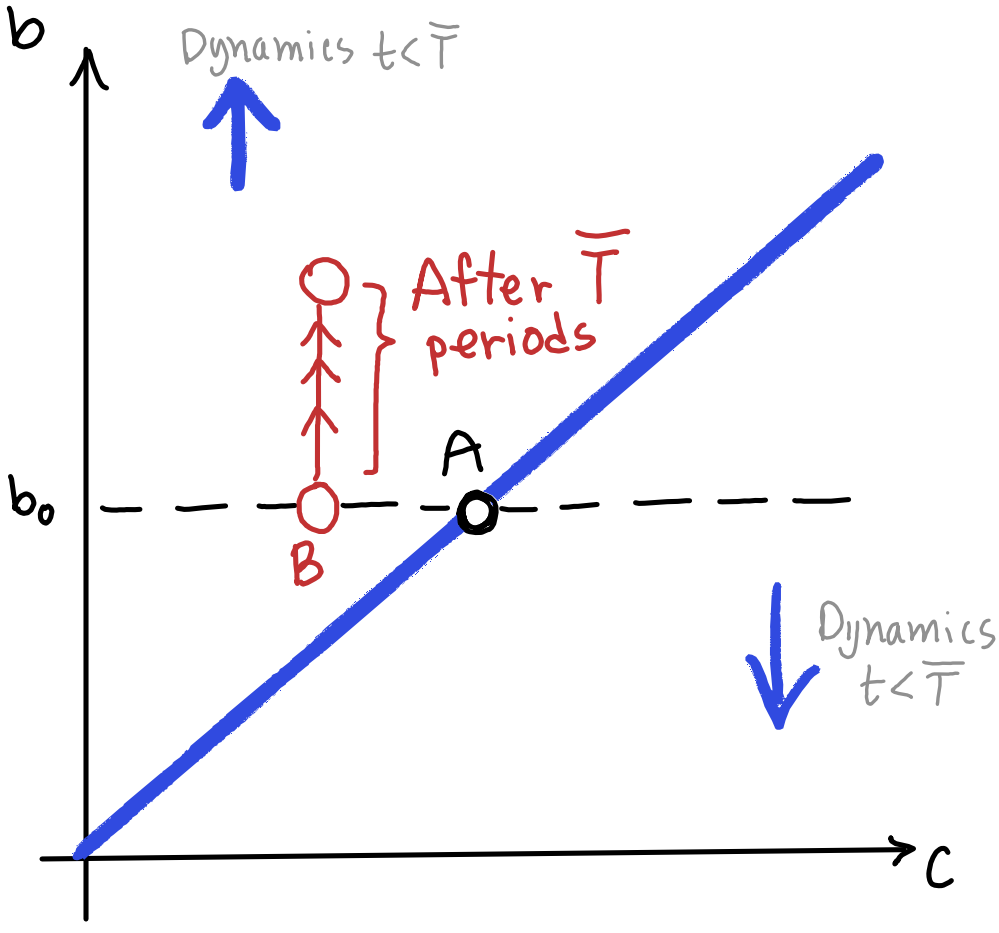


"A" remains eqm

RA

$$\dot{c} = (r - \rho)\, c = 0$$

$$\dot{b} = r\, b - T_t$$



"A" remains eqm

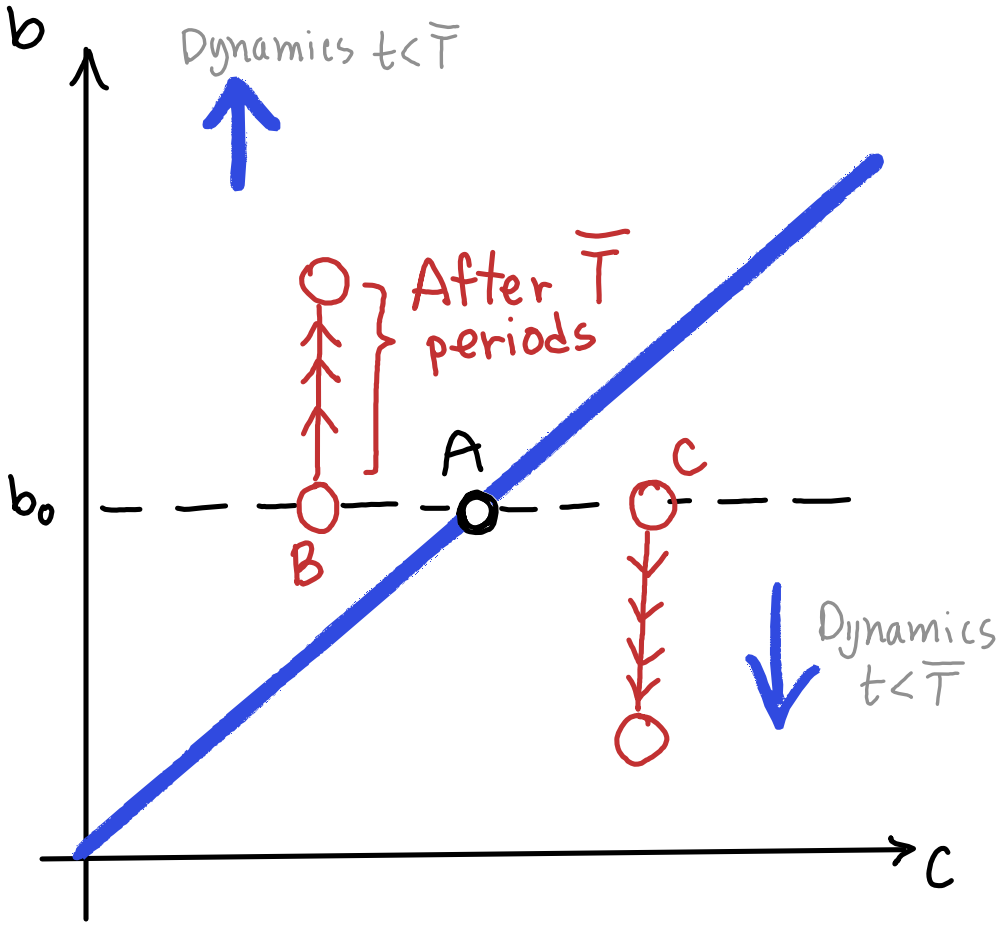
"B" is also a valid eqm.

↳ debt is bounded after $\bar{T}$

RA

$$\dot{c} = (r - \rho)\, c = 0$$

$$\dot{b} = r\, b - T_t$$



"A" remains eqm

"B" is also a valid eqm.

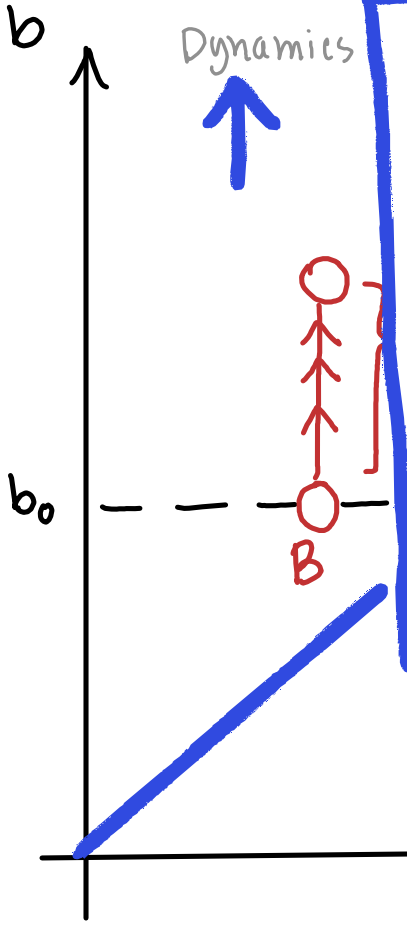
"C" is also valid

Note C is constant over time

RA

$$\dot{c} = (r - \rho)\, c = 0$$

$$\dot{b} = r\, b - T_t$$



For b_0, any c_0 is consistent with eqm.

Fiscal Policy became "Ricardian"

∞ ins eqm

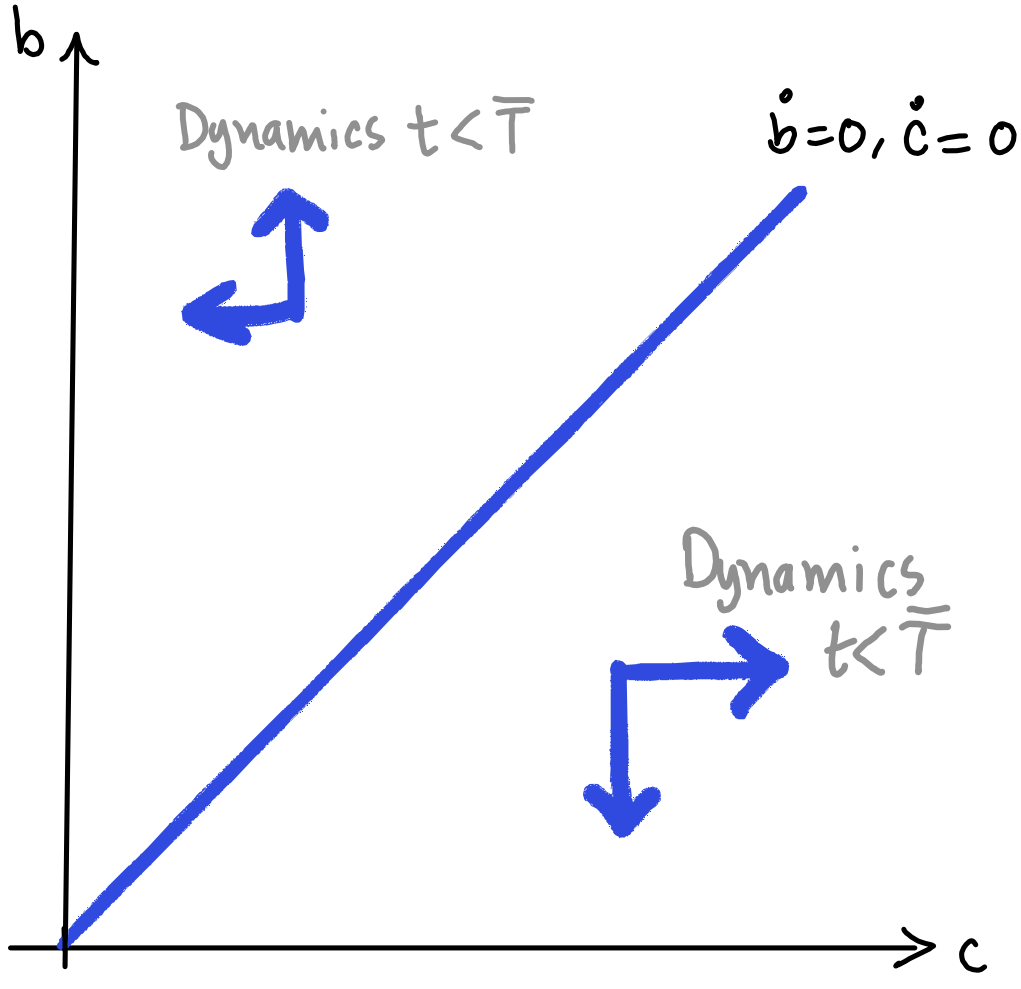
so a valid

bt is bounded

so valid

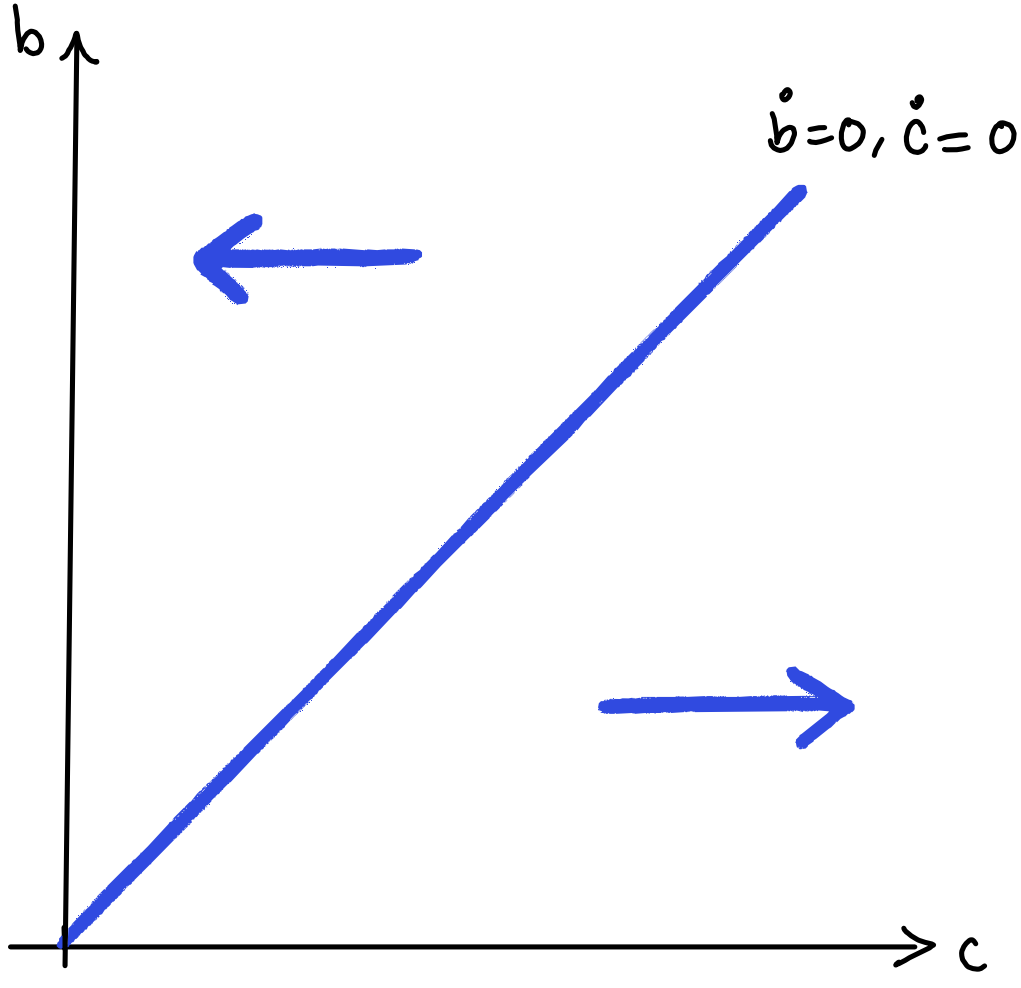
↳ Determinacy is gone.

PERPETUAL YOUTH



Dynamics $t<\bar{T}$

PERPETUAL YOUTH



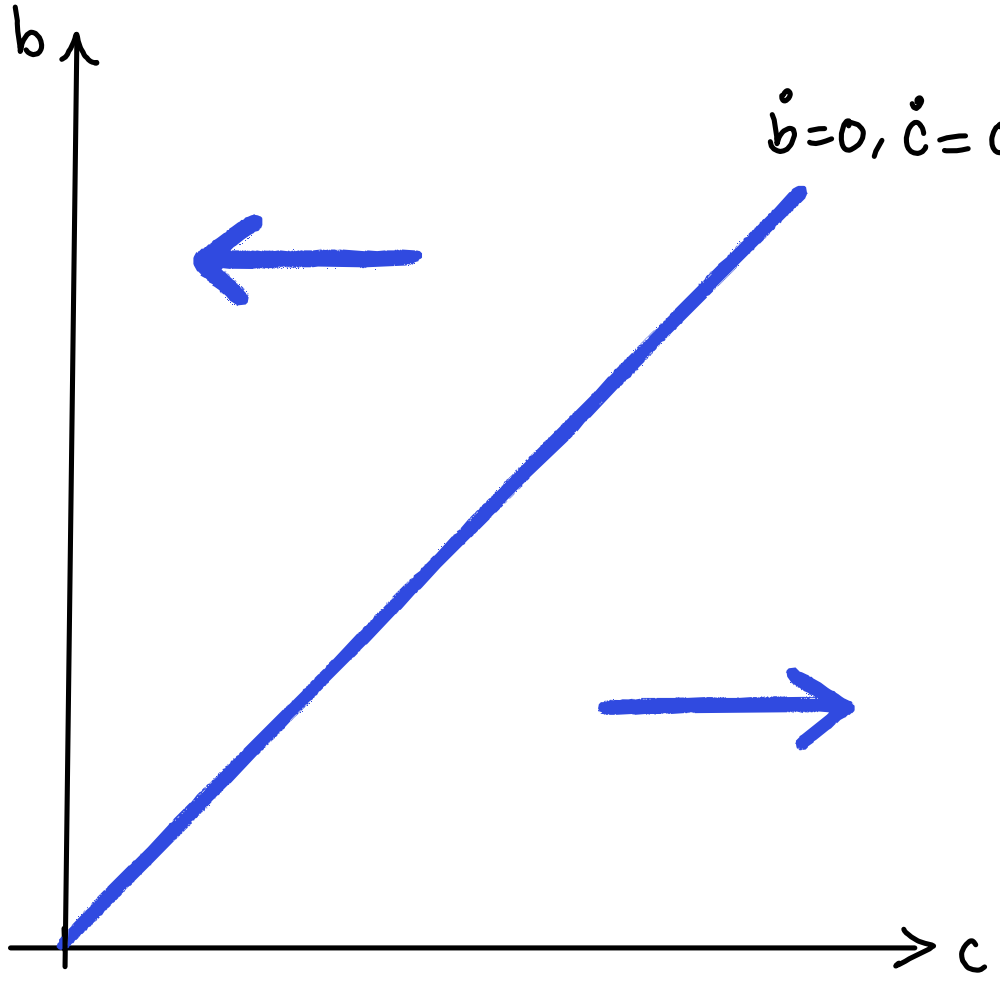
Dynamics
$t \geq \bar{T}$

c keeps drifting, even if b constant

PERPETUAL YOUTH

$$\dot{c} = (r-\rho)c - \mu b$$

need to be in manifold for $\dot{c}=0$



Dynamics

$t \geq \bar{T}$

c keeps drifting, even if b constant

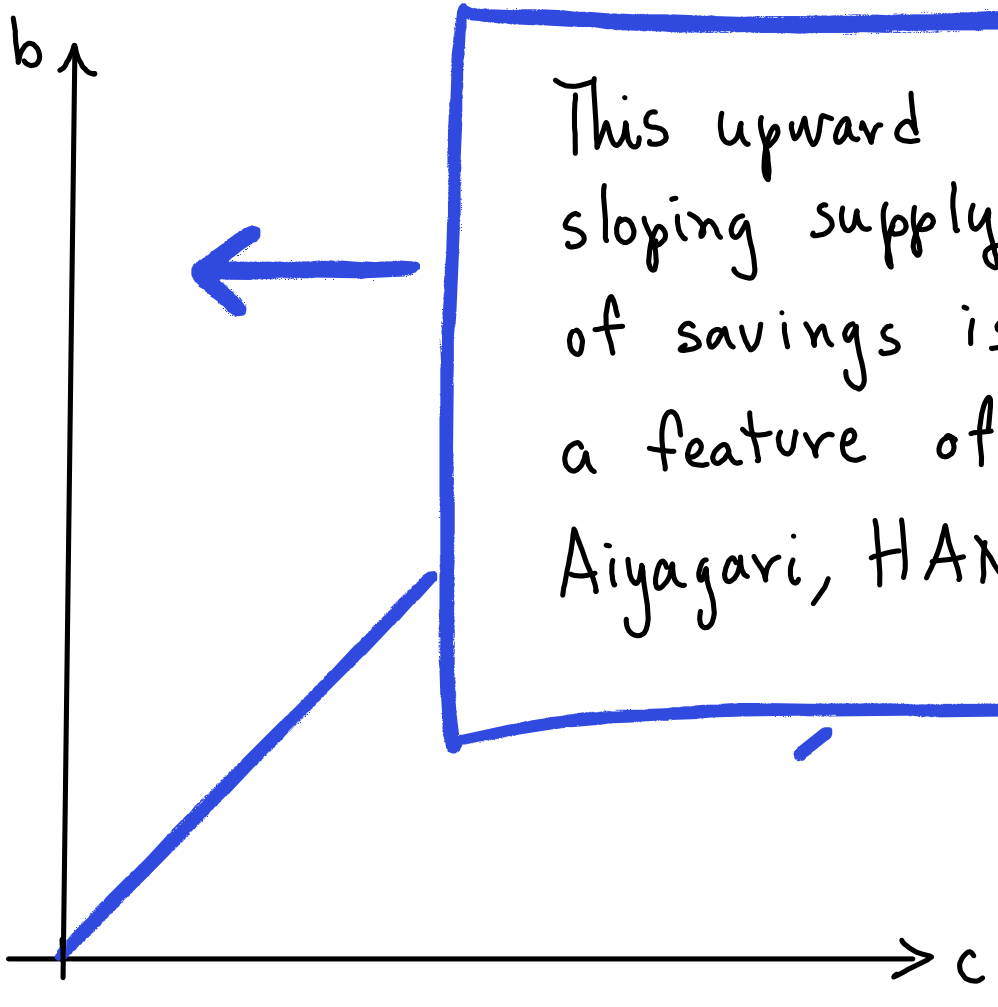
PERPETUAL YOUTH

$\dot{c} = (r-\rho)c - \mu b$

need to be in manifold for $\dot{c}=0$

NOTE

This upward sloping supply of savings is a feature of Aiyagari, HANK...



mics

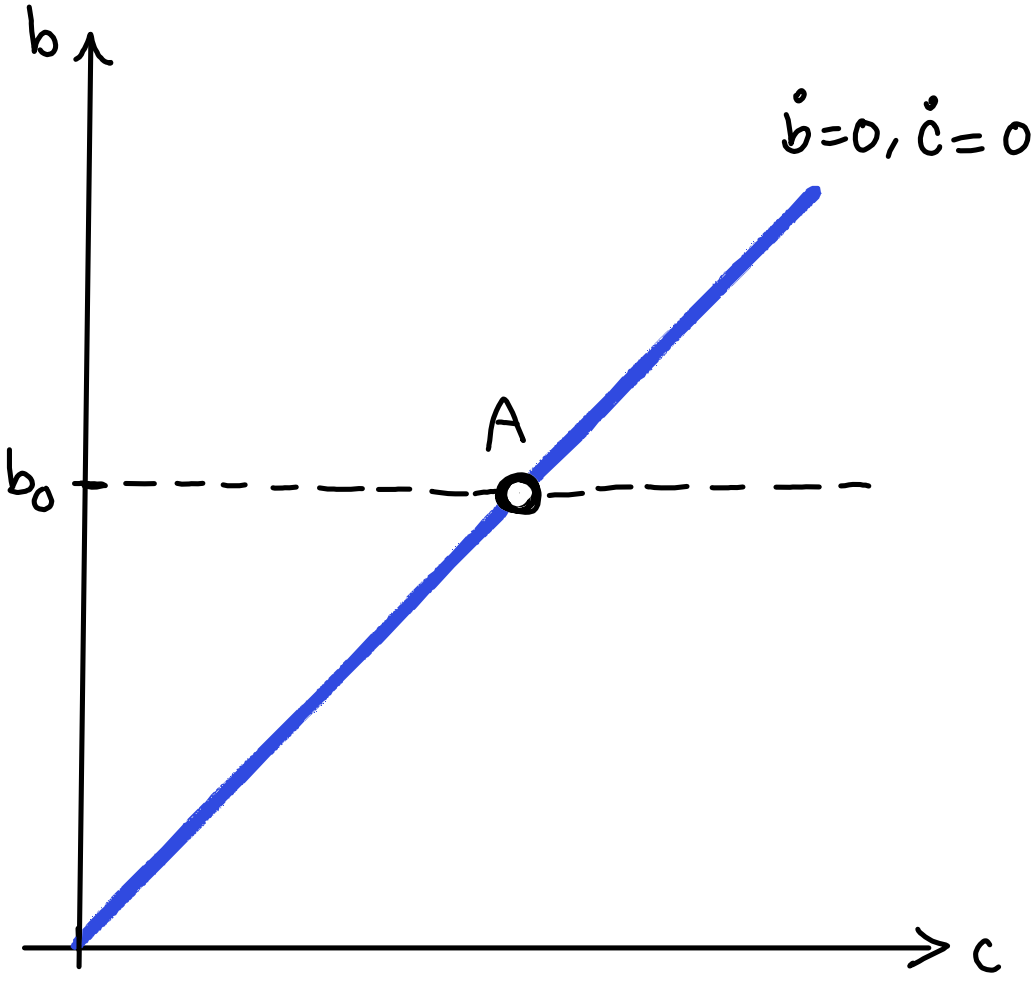
$\geq \bar{T}$

eps

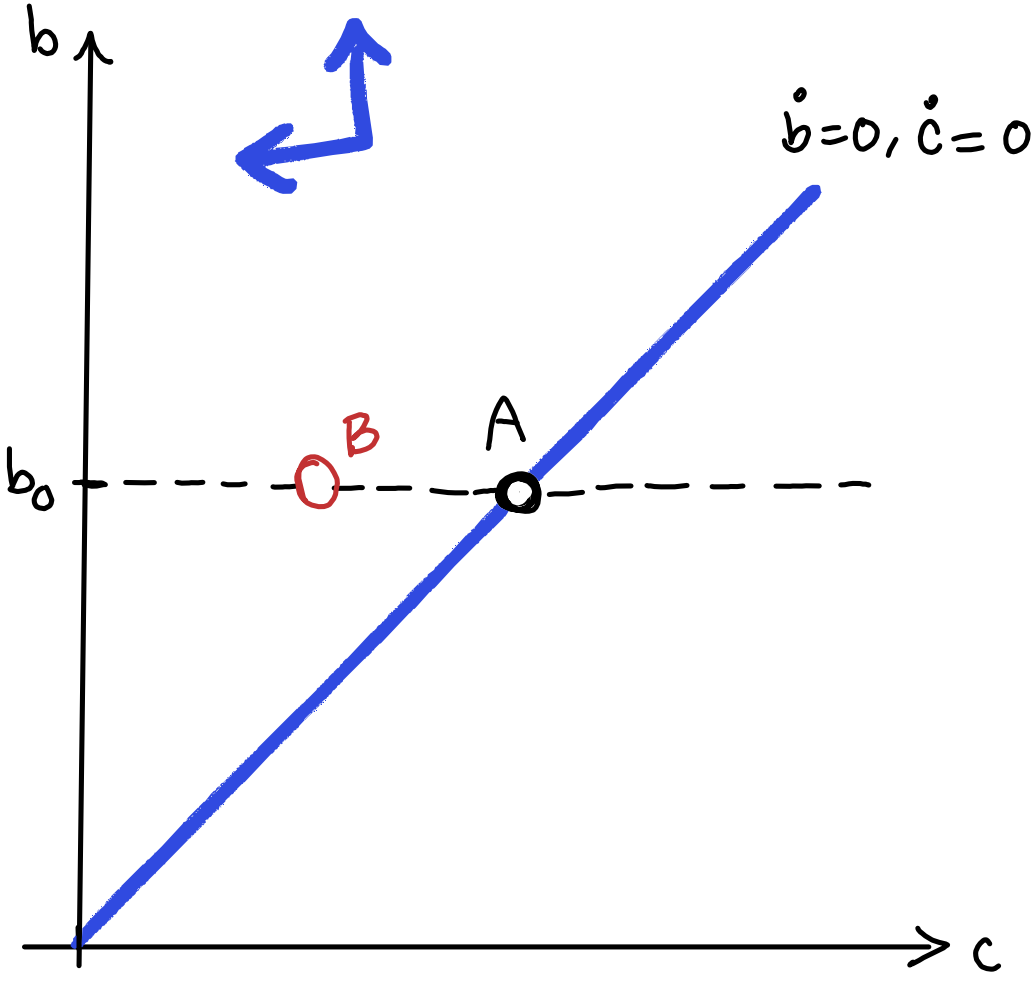
ng, even if b constant

PERPETUAL YOUTH

"A" remains eqm

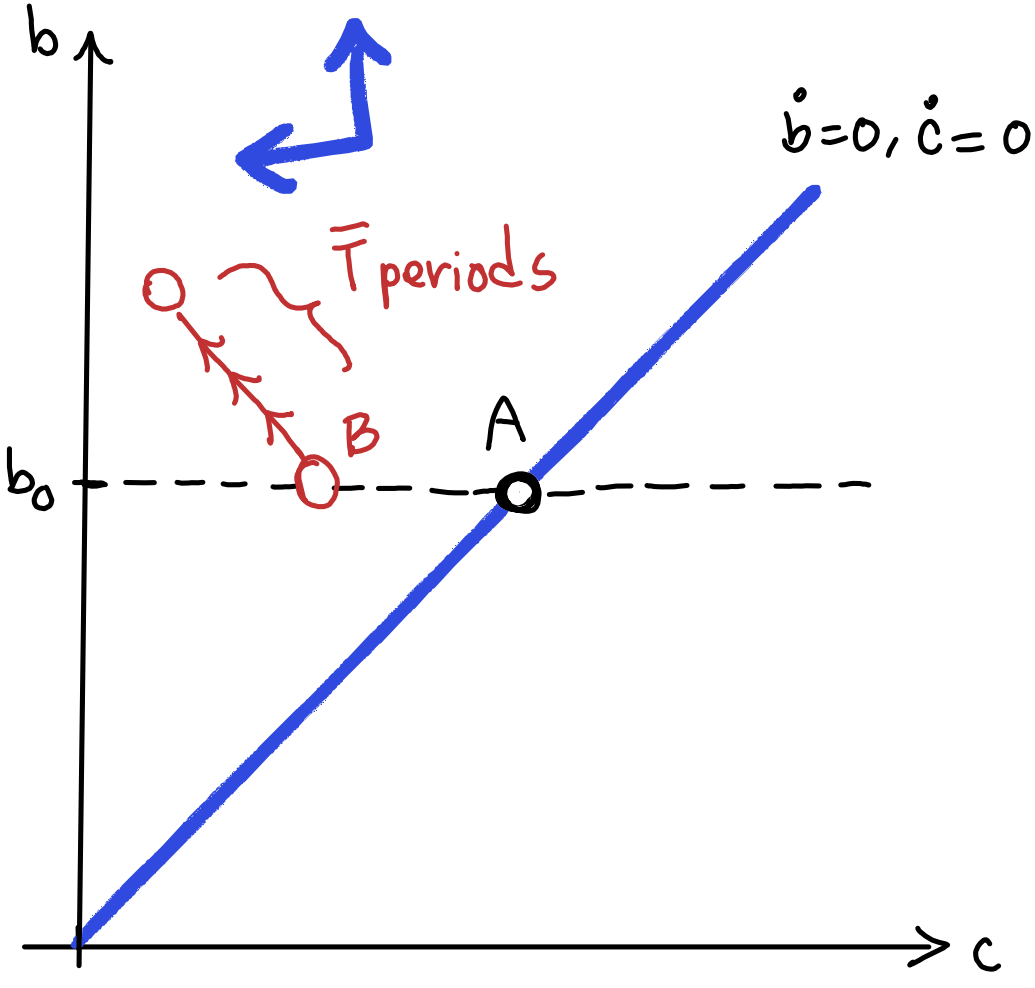


PERPETUAL YOUTH



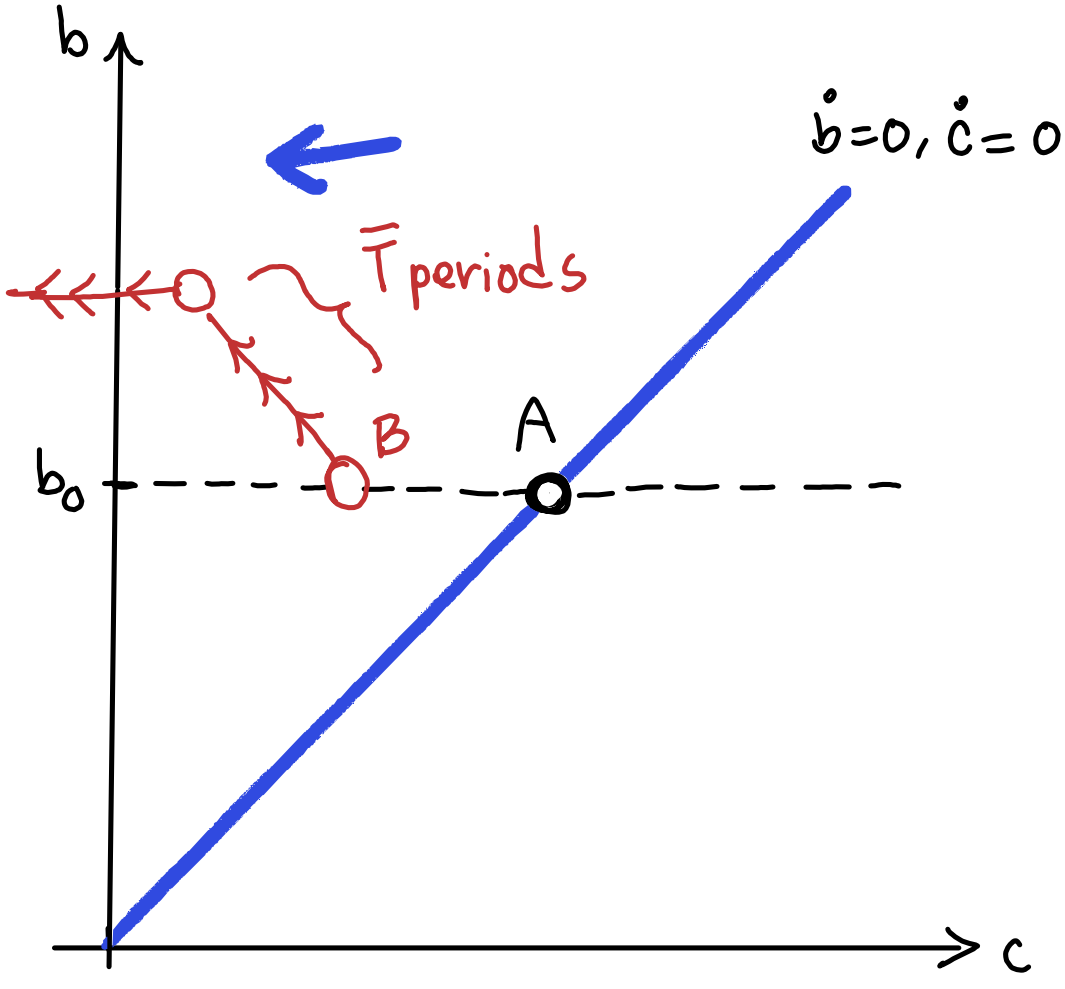
"A" remains eqm

PERPETUAL YOUTH



"A" remains eqm

PERPETUAL YOUTH

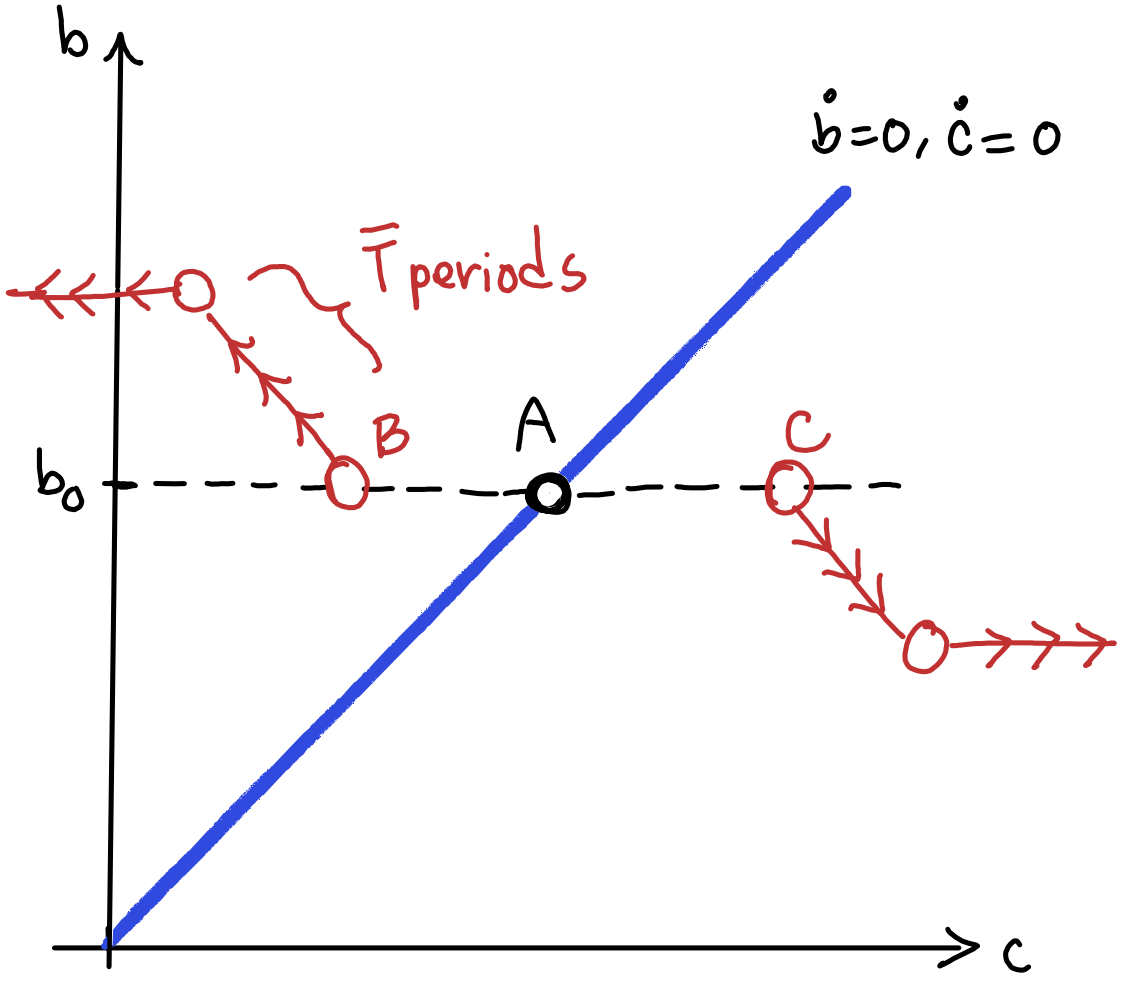


"A" remains eqm

"B" is not

c keeps drifting after $\bar{T}$

PERPETUAL YOUTH



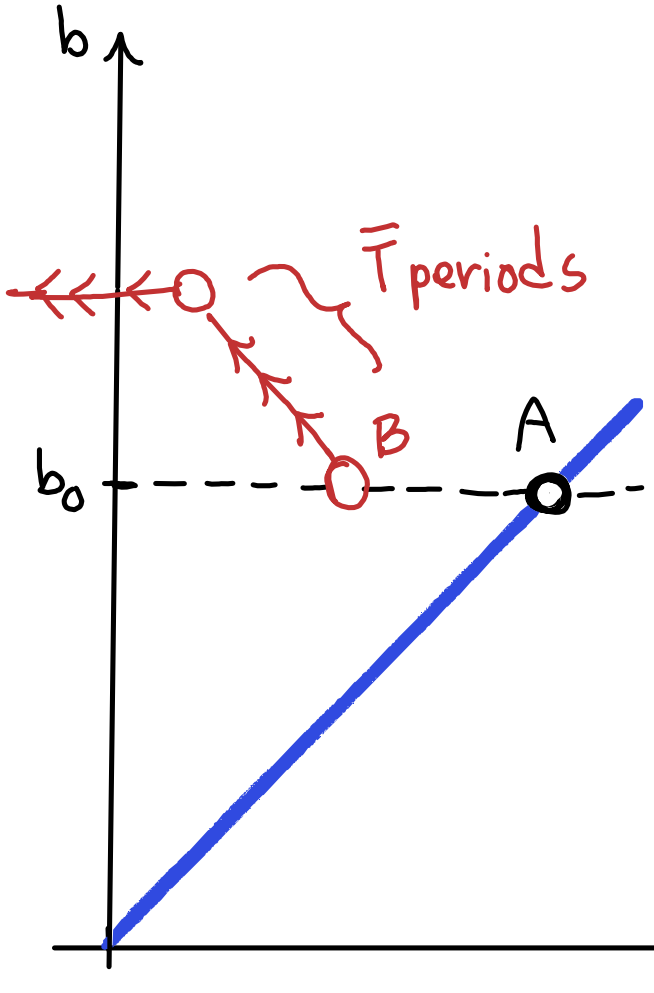
"A" remains eqm

"B" is not

c keeps drifting after $\bar{T}$

"C" is not ...

PERPETUAL YOUTH



Only "A" is eqm

$$C_0 = r\, b_0 / \tau$$

Fiscal policy determines outcomes

→ No need to appeal to Long run budget ...

eqm

fter

...

RA vs Perpetual Youth

- Same implications for determinacy when RA's gov't budget constraint needs to hold

- But these arguments are not necessary for the perpetual youth case
  → Results follow from interest elastic supply of savings

A QUESTION

RA vs Perpetual Youth

- Only Euler Eq is different

RA

$$\dot{c} = (i_t - \rho)\, c$$

PERPETUAL YOUTH

$$\dot{c} = (i_t - \rho)\, c - \mu b$$

A QUESTION

RA vs Perpetual Youth

- Only Euler Eq is different

RA

$$\dot{c} = (i_t - \rho)\, c$$

Let $i_t = \hat{i}_t - \mu b/c$

$$\dot{c} = (\hat{i}_t - \rho)\, c - \mu b$$

← Monetary Policy Ignoring ZLB

PERPETUAL YOUTH

$$\dot{c} = (i_t - \rho)\, c - \mu b$$

A QUESTION

RA vs Perpetual Youth

- Only Euler Eq is different

RA

$$\dot{c} = (i_t - \rho)\, c$$

Let $i_t = \hat{i}_t - \mu b/c$

$$\dot{c} = (\hat{i}_t - \rho)\, c - \mu b$$

PERPETUAL YOUTH

$$\dot{c} = (i_t - \rho)\, c - \mu b$$

The Same ?

A QUESTION

RA vs Perpetual Youth

- Only Euler Eq is different

RA

$$\dot{c} = (i_t - \rho)\, c$$

Let $i_t = \hat{i}_t - \mu b/c$

$$\dot{c} = (\hat{i}_t - \rho)\, c - \mu b$$

PERPETUAL YOUTH

$$\dot{c} = (i_t - \rho)\, c - \mu b$$

The Same ?

We could do it the other way around.

CONCLUSION

- Really great paper
  - Novel insight
  - Relevant to HANK

- I focused discussion on one aspect

  Paper has lots of other results
  - Inflation
  - Long bonds
  - Baby fund
  - Quantitative results