

Dynamics of the Model

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<https://www.pascalmichailat.org/t5.html>



Dynamics of the model.

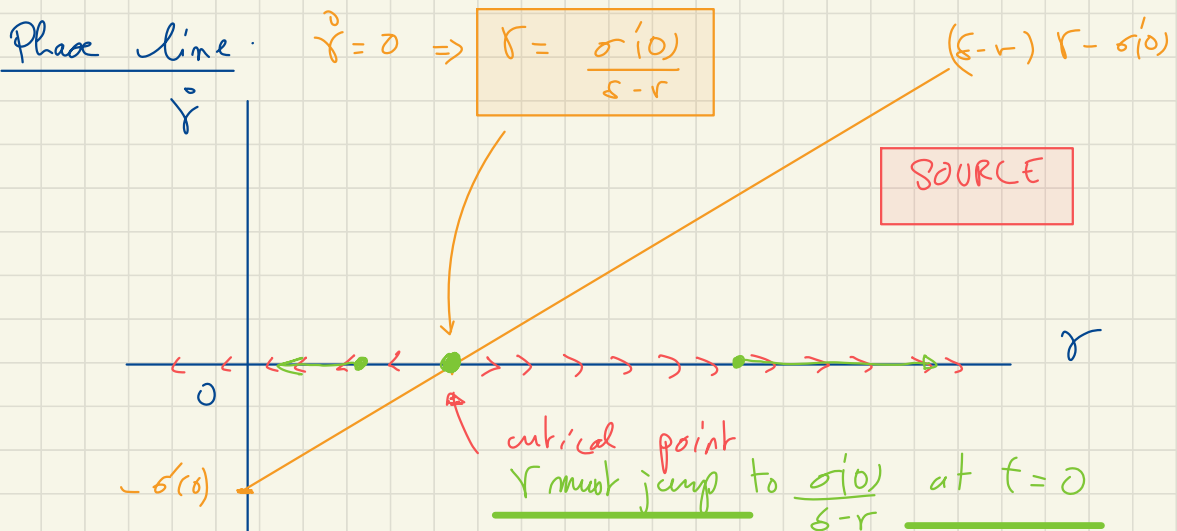
key differential equation: Euler equation describing consumption / saving over time

$$\dot{\gamma}(t) = [s - r(t)] \gamma(t) - \sigma'(w(t) - \bar{w}(t))$$

- $r(t) = r$ (inflation + nominal interest rate are fixed)
- homogeneous households \rightarrow hold same wealth
 $\rightarrow w(t) = \bar{w}(t)$

Euler equation simplifies to,

$$\dot{\gamma}(t) = (s - r) \gamma(t) - \sigma'(0)$$



τ is a costate variable, determined by consumption
↳ non-pre determined variable

(it can jump at t)

Although τ, c are given by a differential equation $\rightarrow \tau, c$ directly jump to critical point of dynamical system at $t=0 \rightarrow$ no transition to critical point. transition is immediate -

At $t=0$, $\tau = \sigma'(0) / [\delta - r]$ and consumption is given by:

$$c = \left[\frac{\delta - r}{\sigma'(0)} \cdot \frac{1}{1 + \tau(0)} \right]^{\frac{1}{\epsilon}}$$

$0 < c < \infty$
↑
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