A Positive Theory of Dynamic Development Policies

Diego Huerta

June 30, 2022

Motivation

- **Development policies:** intervention in product and factor markets.

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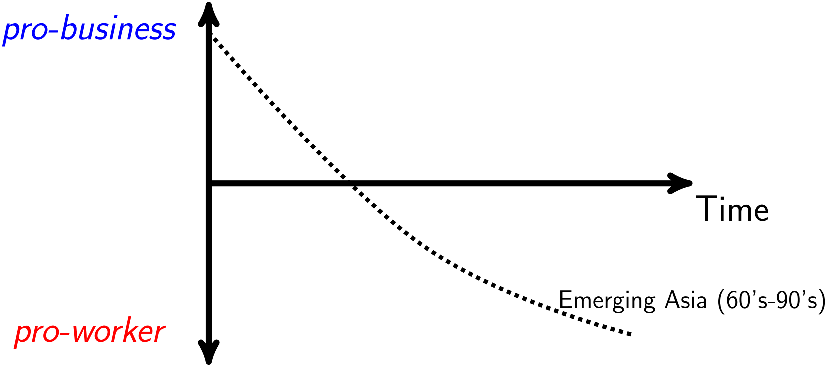

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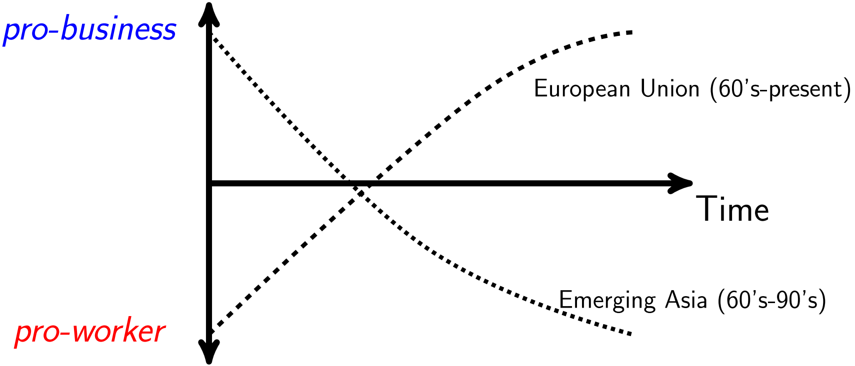

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$\boxed{\text{Inequality}_t} \longrightarrow \boxed{\textbf{Interest groups}_t}$

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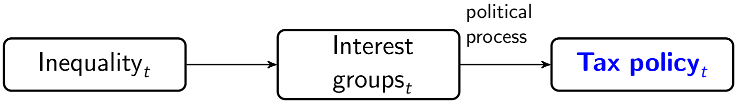

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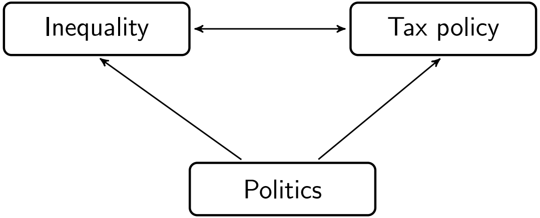

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2. Transition dynamics of the policy platform?

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1. Economic interests towards tax policies?
    - Distributional conflict.
2. Transition dynamics of the policy platform?
    - Depend on initial inequality and capital constraints.

Related Literature

Macro

- Ramsey-policies: Itskhoki and Moll (2019, ECMA), Straub and Werning (2020, AER)

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Political Economy

- Government debt and fiscal policies: Song et al. (2012, ECMA).
- Capital taxation: Farhi et al. (2012, REStud).
- Social security: Gonzalez-Eiras and Niepelt (2008, JME), Sleet and Yeltekin (2008, JME).
- Income redistribution: Hassler et al. (2005, JME).
- Financial and labor policies: Pagano and Volpin (2005, AER), Fischer and Huerta (2021, JPubE)

Contribution

1. Tractable model with heterogeneous agents and political process.
   - Latest tools in macro models with continuous-time (Achdou et al., 2022, REStud).
   - Probabilistic voting (Song et al., 2012, ECMA).
2. Transition dynamics of the equilibrium policy platform.
   - Rationale for the international differences in development policies.
   - Joint evolution of inequality and policies.

Comparison to standard heterogeneous agents model

Base Model: Moll (2014, AER); Buera and Moll (2015, AEJ); Itskhoki and Moll (2019, ECMA)

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Simplifications:

1. Fixed investment (homogeneous firms)
2. No stochastic shocks

Model

- Continuum of agents heterogeneous in wealth a_t.

$$\max_{\{c_t\}_{t=0}^{+\infty}} \left\{ \int_0^\infty e^{-\rho t} \frac{c_t^{1-\gamma}}{1-\gamma} dt \right\}$$

$$\begin{aligned} s.t \qquad & \dot{a}_t = r(1-\tau_t)a_t + w_t \bar{l} + \Pi_t + T_t - c_t, \\ & a_t \geq \underline{a}. \end{aligned}$$

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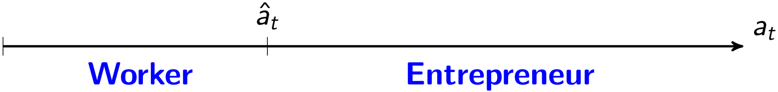

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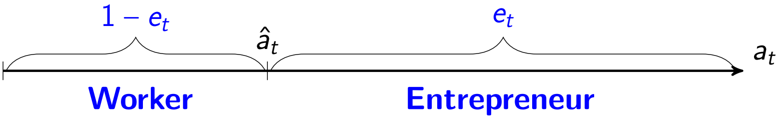

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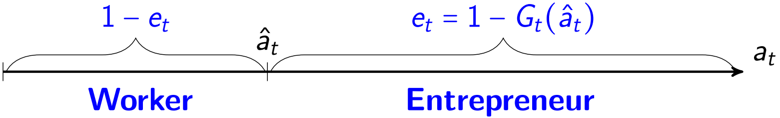

Political Preferences

$$\tau(a_t, G_t)$$

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- $\tau(a_t, G_t)$ maximizes disposable income y_t.

$$\tau(a_t, G_t) = argmax_{\tau \in [\underline{\tau}, 1)} \; y_t(\tau, G_t) = \begin{cases} y_t^W & \text{if } a_t < \hat{a}(\tau, G_t) \\ \Pi_t + y_t^W & \text{if } a_t \geq \hat{a}(\tau, G_t) \end{cases}$$

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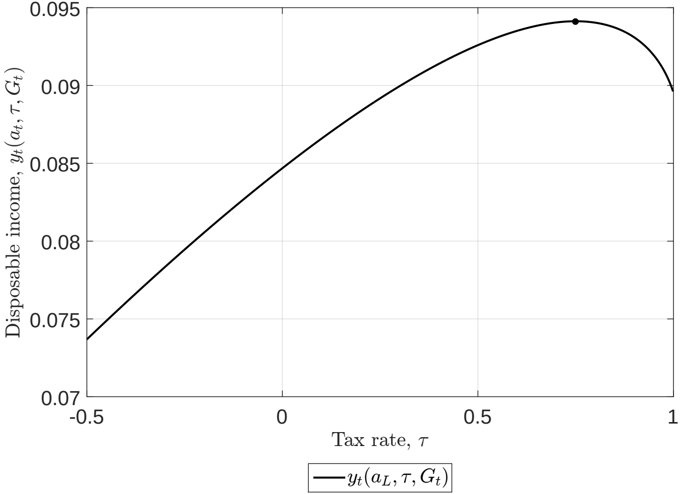
- $\uparrow \tau \Rightarrow \uparrow \hat{a} \Rightarrow \uparrow p$ and $\downarrow w$.

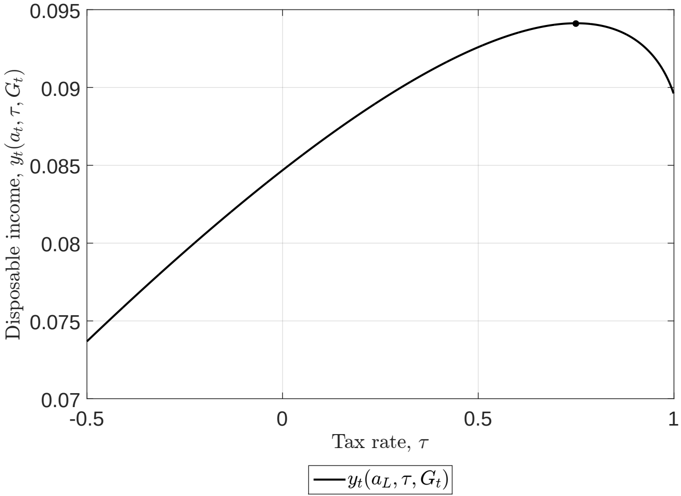
Income as a function of a and τ

$$y_t = r(1-\tau)a_L + w_t\bar{l} + T_t$$



Income as a function of a and τ

$$y_t = r(1-\tau)a_L + w_t\bar{l} + r\tau A_t$$



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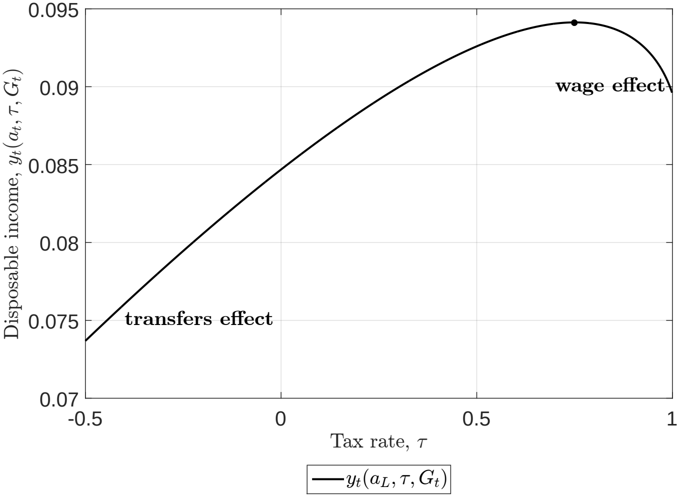
$$y_t = ra_L + r\tau(A_t - a_L) + w_t\bar{l}$$



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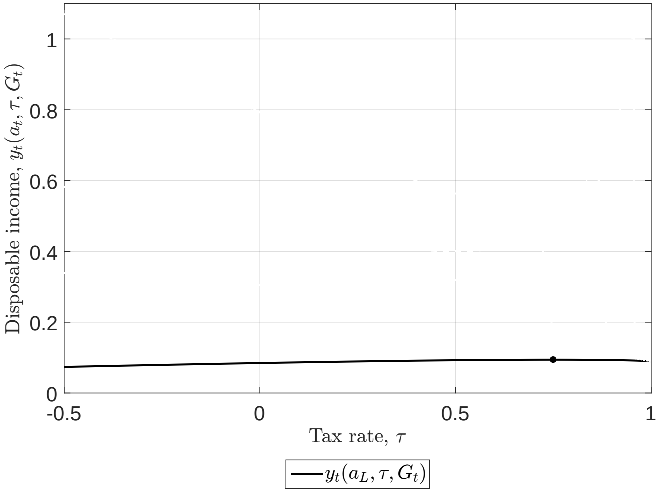

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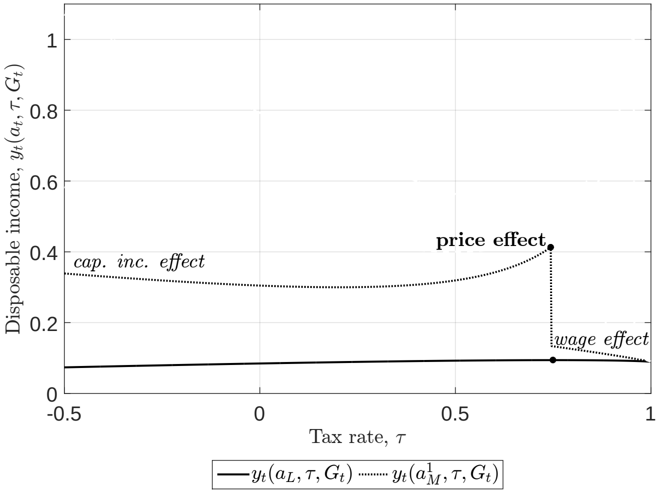
$$y_t = r(1-\tau)a_M^1 + w_t\bar{l} + T_t + \boldsymbol{\Pi_t}$$



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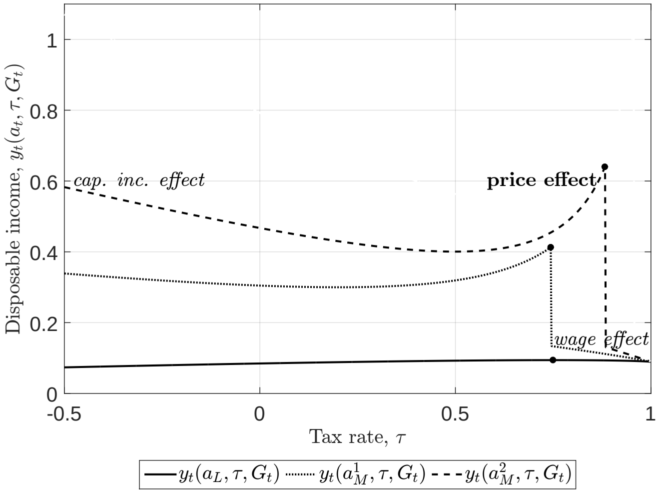

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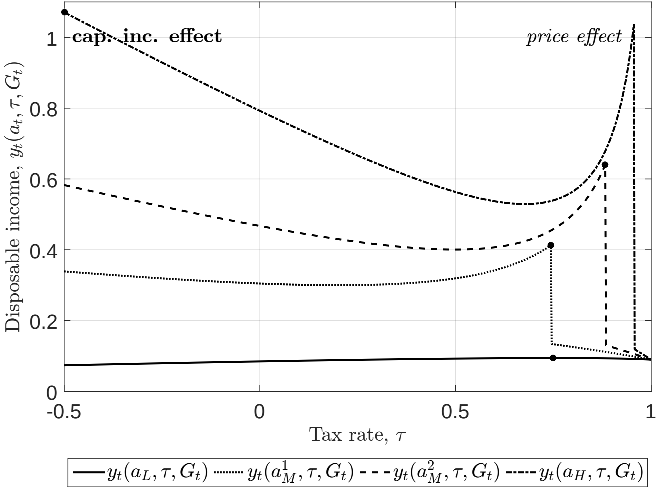

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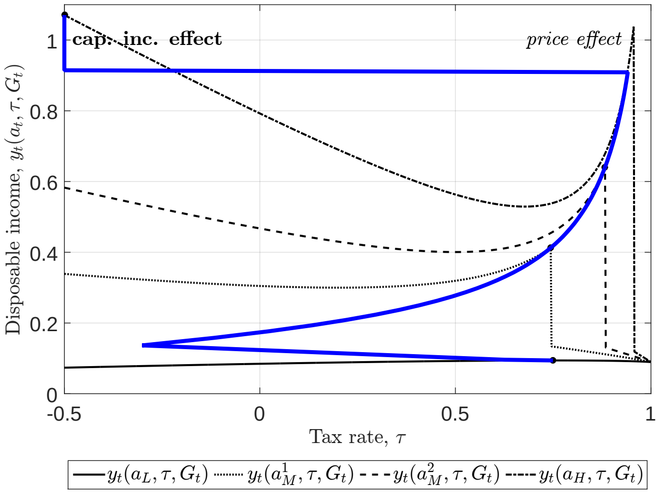
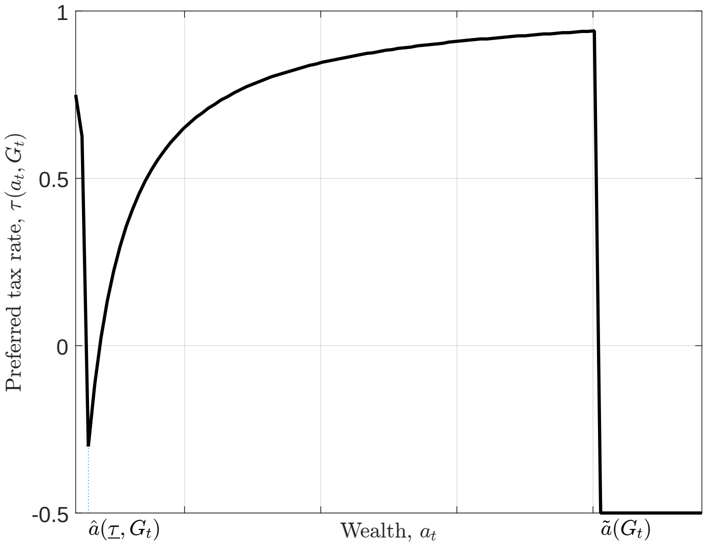


Preferred tax rate



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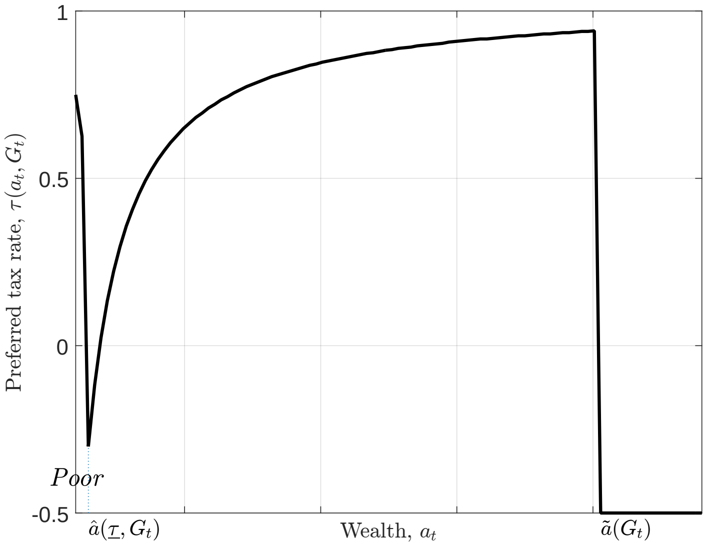

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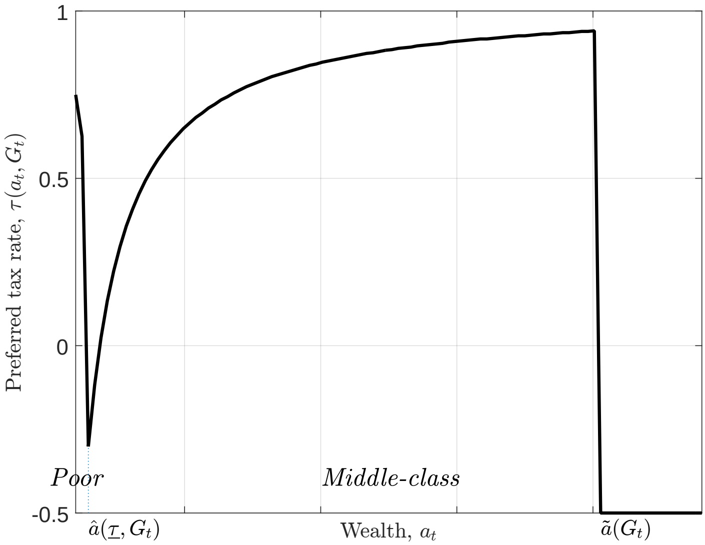

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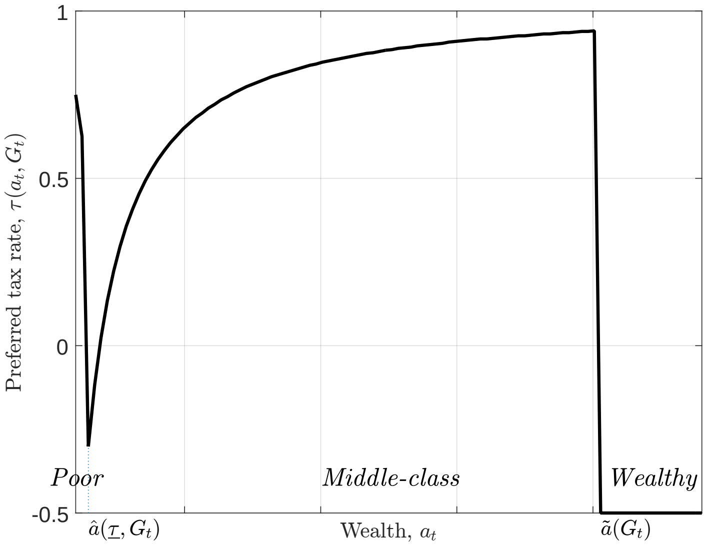

Political Mechanism

$$\tau_t$$

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- *Political objective function:* weighted measure of y_t.
  - $\uparrow e \Rightarrow \uparrow \tau$ **(pro-business)**
- Repeated elections: *lack of commitment* (e.g. Farhi et al., 2012, REStud).

Steady-state
(τ^*, G^*)

Steady-state

- Savings: $s_t(a_t) = \theta_t \cdot y(a_t, \tau_t)$, where:

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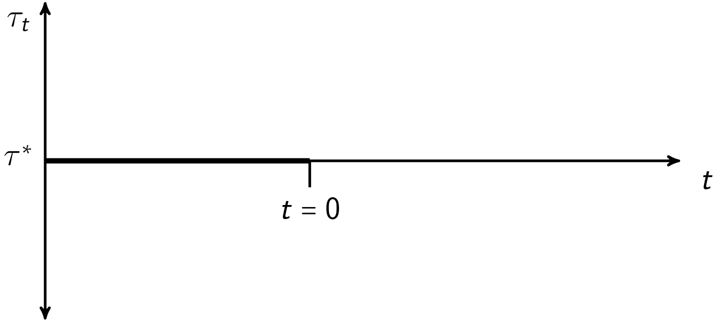
- Stationary wealth distribution (non-unique):
    - $G_0 \rightarrow \boldsymbol{G^*}$

Transition Dynamics

$$\{\tau_t\}_{t=0}^{+\infty}$$

Evolution of τ_t given G_0?

Idea: perturb G^* to obtain G_0 and study $\{\tau_t\}_{t=0}^{+\infty}$.



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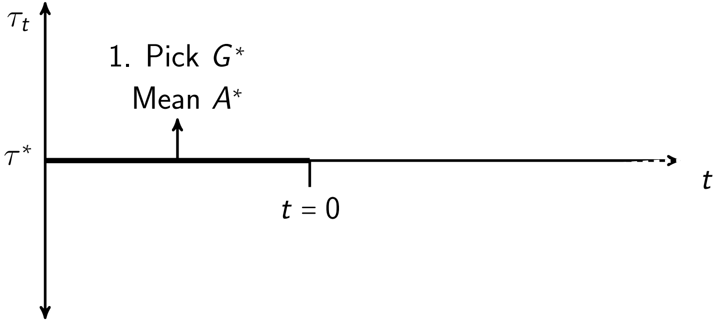

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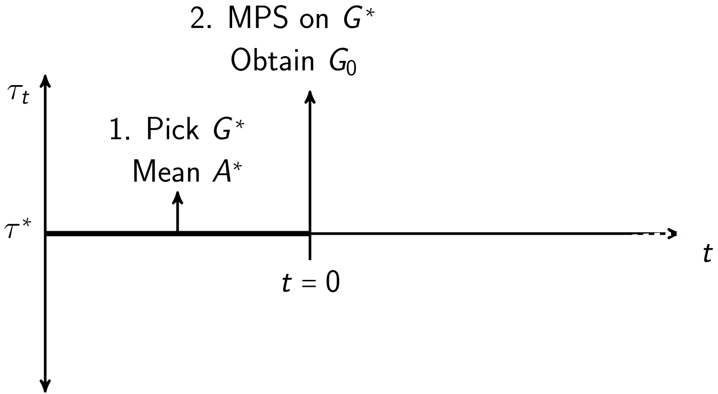

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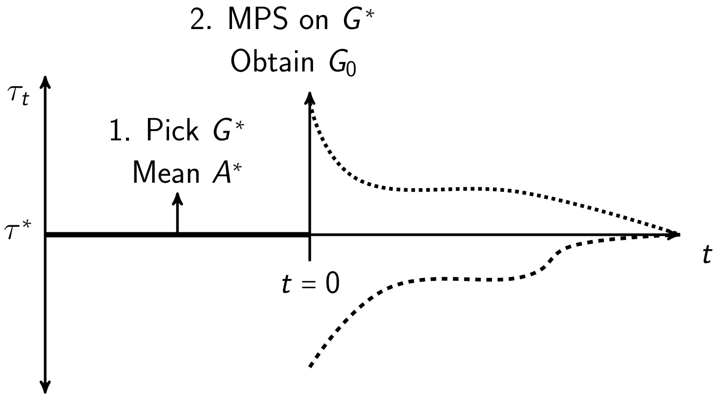

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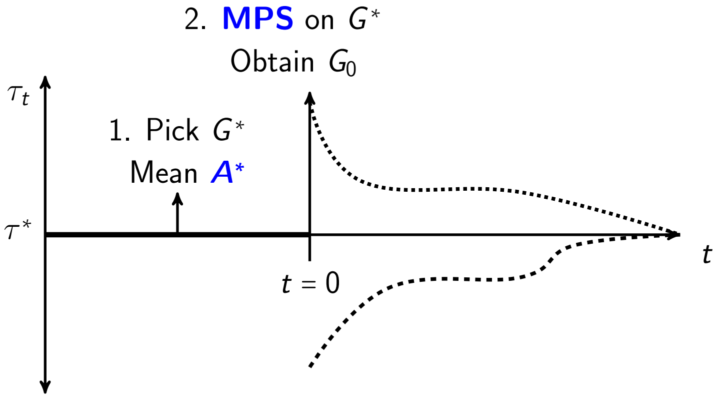

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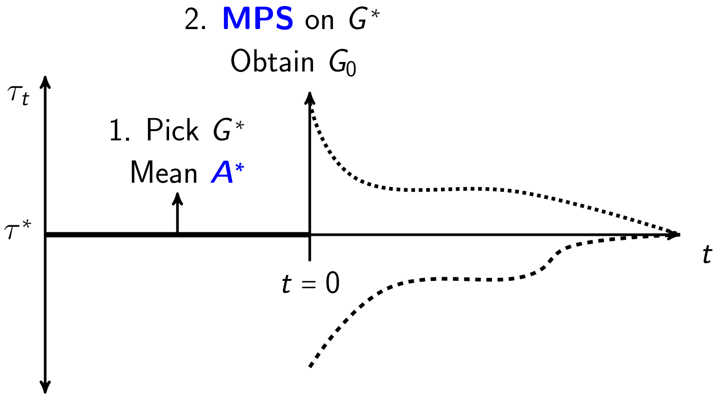

$A^* < \hat{a}^*$: **Capital constrained** MPS: **inequality**

Evolution of τ_t given G_0?

Main Result

	Unequal	Equal
Constrained $(A^* < \hat{a}^*)$		
Unconstrained $(A^* > \hat{a}^*)$		

Evolution of τ_t given G_0?

Main Result

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Constrained $(A^* < \hat{a}^*)$	**PB** $\rightarrow$ **PW**	
Unconstrained $(A^* > \hat{a}^*)$	**PW** $\rightarrow$ **PB**	

Evolution of τ_t given G_0?

Main Result

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Main Result

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Unconstrained $(A^* > \hat{a}^*)$	**PW** $\rightarrow$ **PB**	**PB** $\rightarrow$ **PW**

Evolution of τ_t given G_0?

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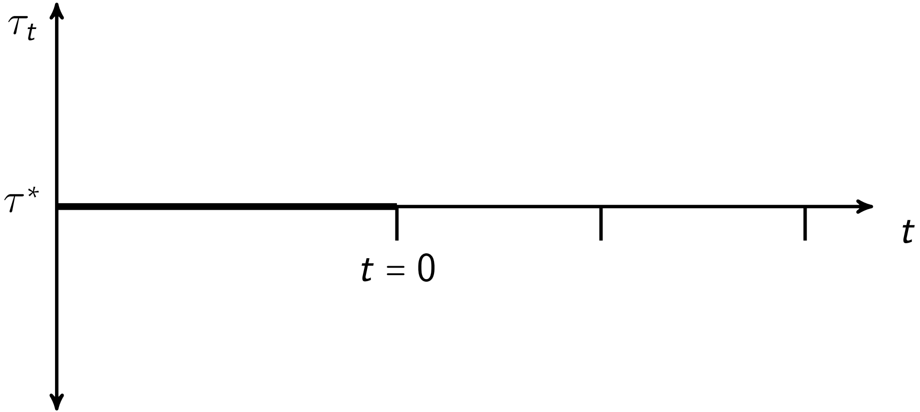
Unconstrained $(A^* > \hat{a}^*)$	**PW $\rightarrow$ PB**	**PB $\rightarrow$ PW**

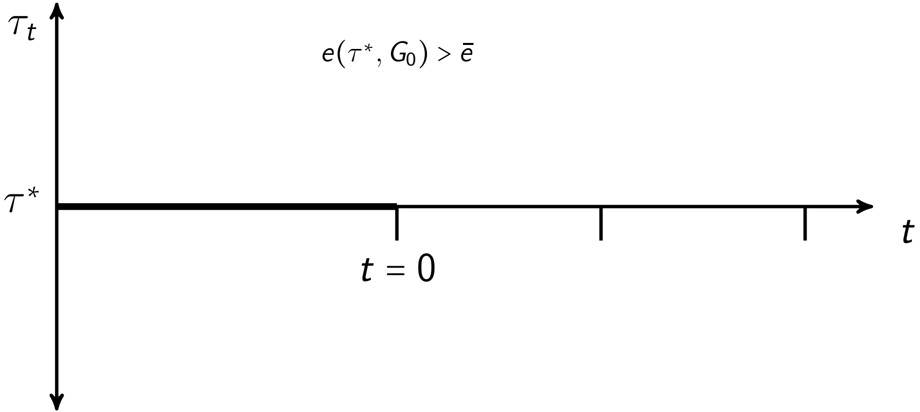
Intuition:
Constrained ($A^* < \hat{a}^*$)
Unequal

Transition dynamics of unequal countries



- G_0: constrained ($A^* < \hat{a}^*$) and unequal

Transition dynamics of unequal countries



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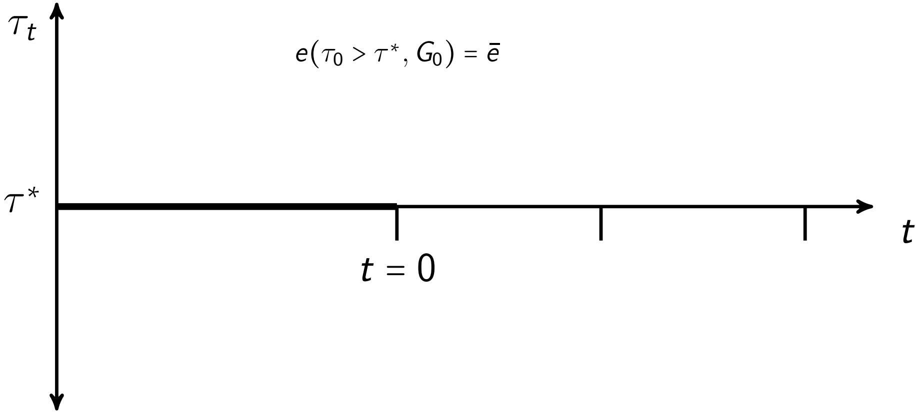
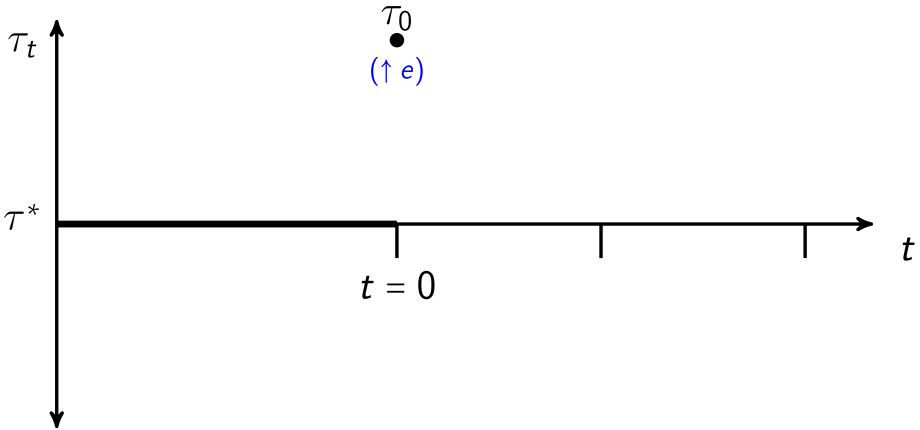
Transition dynamics of unequal countries



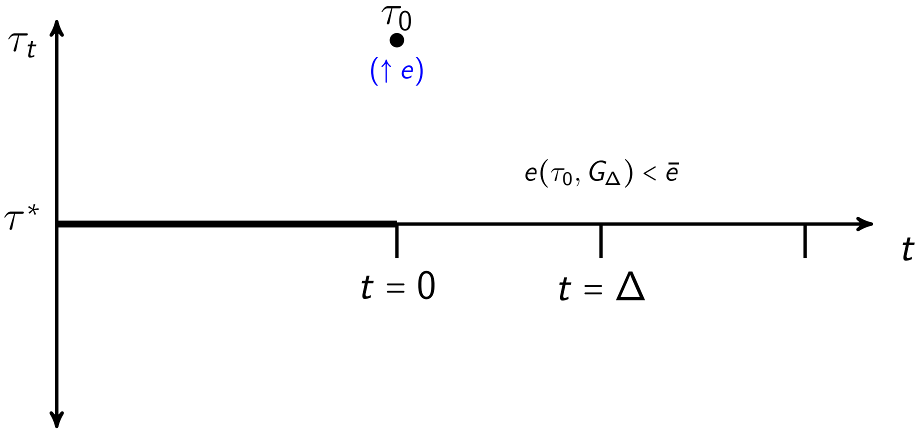
- G_0: constrained $(A^* < \hat{a}^*)$ and unequal

Transition dynamics of unequal countries



G_0: constrained $(A^* < \hat{a}^*)$ and unequal

Transition dynamics of unequal countries



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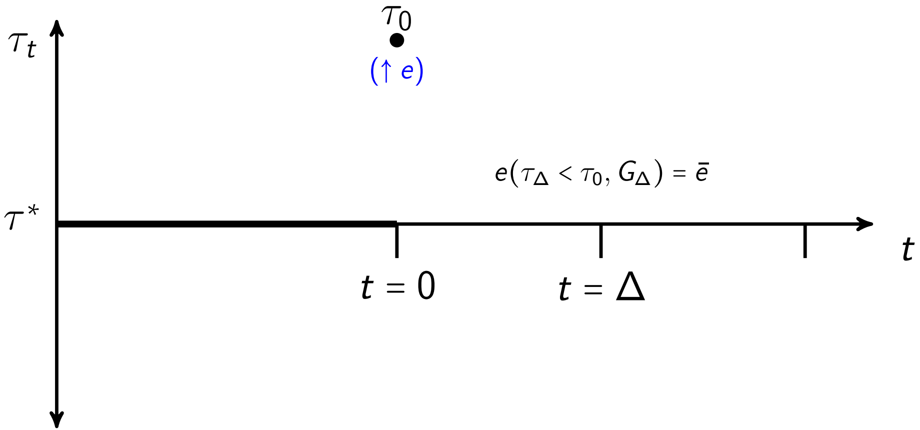
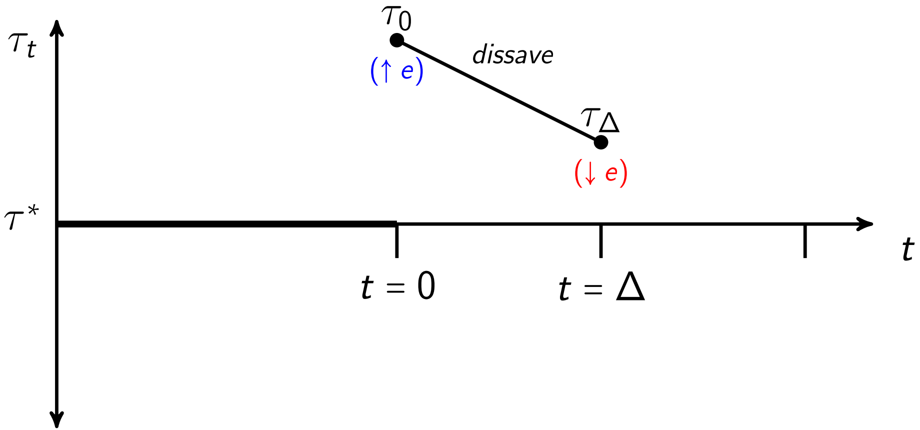
Transition dynamics of unequal countries



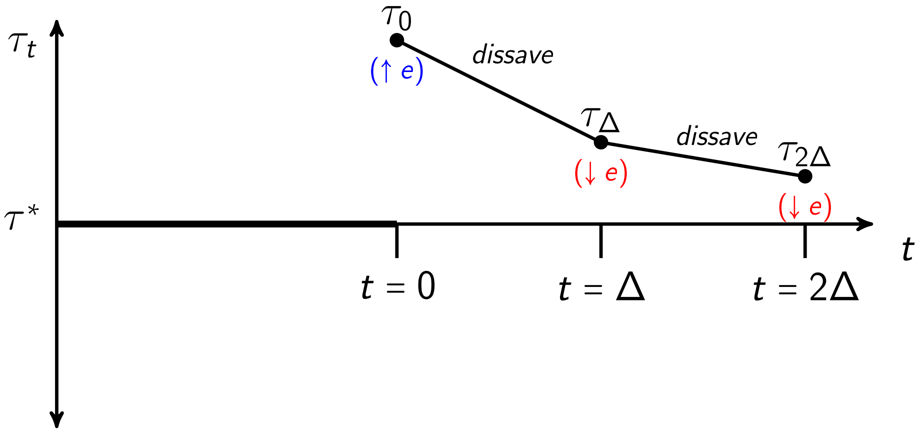
- G_0: constrained $(A^* < \hat{a}^*)$ and unequal

Transition dynamics of unequal countries



- G_0: constrained $(A^* < \hat{a}^*)$ and unequal

Transition dynamics of unequal countries



- G_0: constrained $(A^* < \hat{a}^*)$ and unequal

Future Work

Extensions

1. Different policy instruments (as Itskhoki and Moll, 2019, ECMA)
    - Closed economy
2. Individual preferences $\rightarrow$ value function at t
3. Alternative institutions: democracy vs. dictatorship

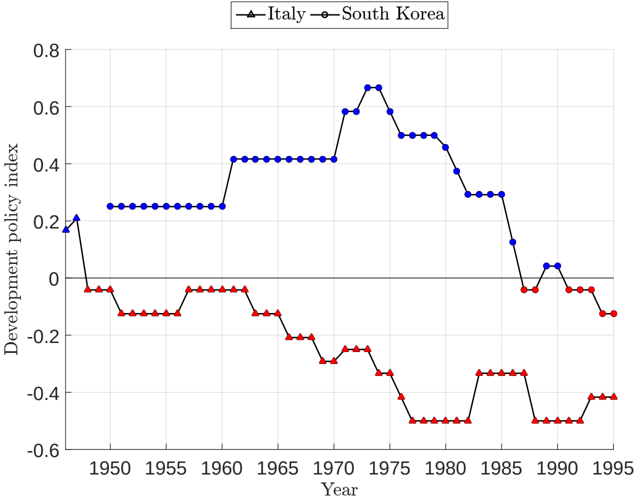
Organizing historical accounts

- **Step 1:** Classify development policies.

Pro-business	Pro-labor
Export subsidies	*Union rights*
Credit subsidies	*Wage regulation*
Input subsidies	*Health and safety*
Innovation subsidies	*Working hours*
Tax exemptions	*Dismissal protection*

- **Step 2:** Review historical accounts (papers, books, official documents).
- **Step 3:** Compute a development policy index.

Organizing historical accounts



THANKS!

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Main Principle

"Laws result from the political process, however, which in turn responds to economic interests. In this sense, legal rules and economic outcomes are **jointly determined**, *politics being the link between them."*
(Pagano and Volpin, 2005, AER)

back to main

Incentive compatibility

Budget constraint

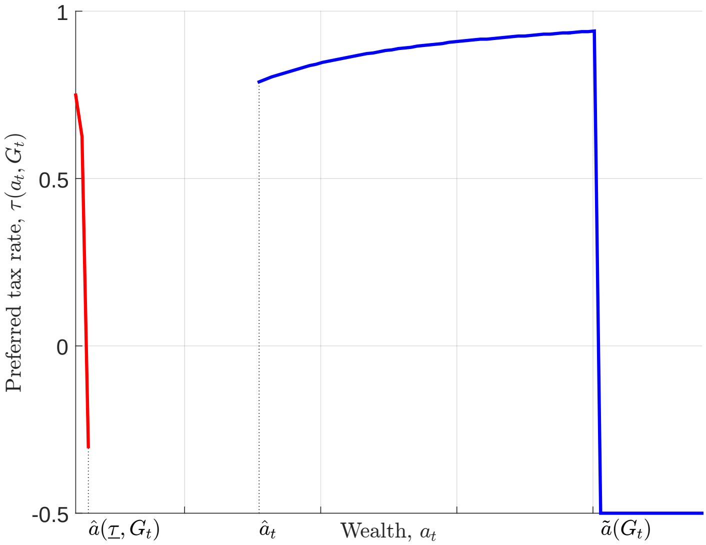
$$
\begin{aligned}
\dot{a}_t &= p_t R - rI + r(1-\tau_t)a_t + w_t\bar{l} + T_t \\
&= p_t R - \underbrace{r(I-(1-\tau_t)a_t)}_{\equiv d_t} + w_t\bar{l} + T_t \\
&= p_t R - rd_t + w_t\bar{l} + T_t
\end{aligned}
$$

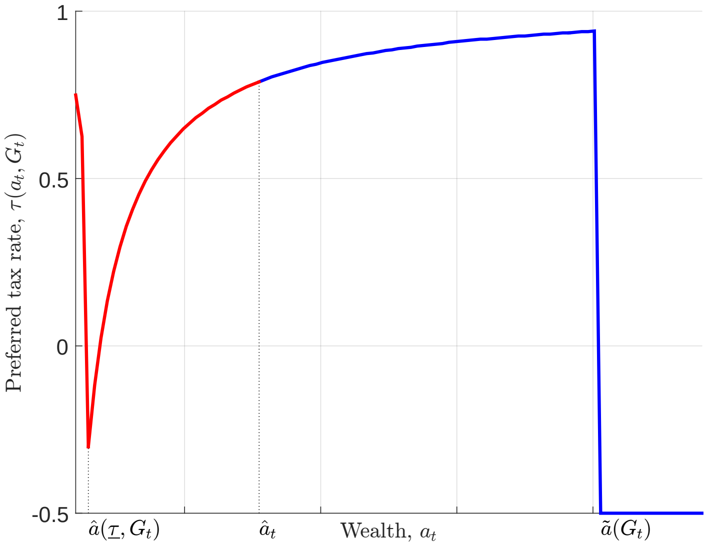
Incentive compatibility

$$
p_t R - rd_t \geq d_t \Leftrightarrow p_t R - r(I-(1-\tau_t)a_t) \geq I-(1-\tau_t)a_t
$$

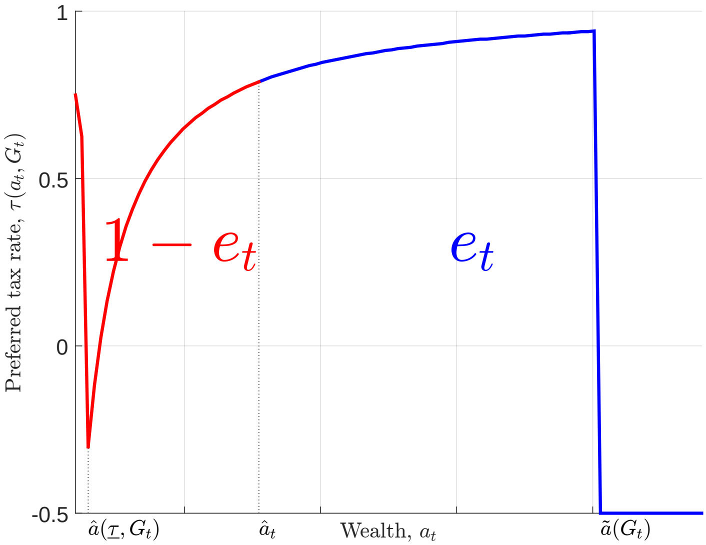
$$
\Rightarrow \hat{a}(\tau_t, G_t) = \left(I - \frac{p(k_t)R}{1+r}\right)\frac{1}{1-\tau_t}
$$

back to main


1
0.5
0
-0.5
Preferred tax rate, $\tau(a_t, G_t)$
$\hat{a}(\underline{\tau}, G_t)$
$\hat{a}_t$
Wealth, a_t
$\tilde{a}(G_t)$



1
0.5
0
-0.5
Preferred tax rate, $\tau(a_t, G_t)$
$\hat{a}(\underline{\tau}, G_t)$
$\hat{a}_t$
Wealth, a_t
$\tilde{a}(G_t)$


1
0.5
0
-0.5
Preferred tax rate, $\tau(a_t, G_t)$
$1 - e_t$
e_t
$\hat{a}(\underline{\tau}, G_t)$
$\hat{a}_t$
Wealth, a_t
$\tilde{a}(G_t)$

back to main

Political equilibrium

$$\rho v(a_t) = \max_{c_t} \left\{ u(c_t) + d_a v(a_t)(y(a_t,\tau_t) - c_t) \right\},$$

$$\begin{aligned} s.t \qquad & \dot{a}_t = y(a_t,\tau_t) - c_t, \\ & a_t \geq \underline{a}. \end{aligned} \tag{HJB}$$

$$d_t G_t(a) = -[G_t(\hat{a}_t) \cdot s_t^W(a,\tau_t) + (1 - G_t(\hat{a}_t)) \cdot s_t^E(a,\tau_t)] d_a G_t(a) \tag{KF}$$

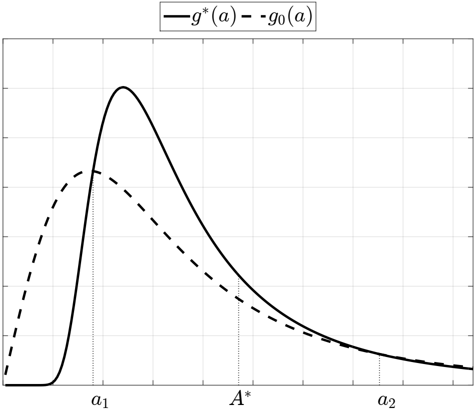
$$\boldsymbol{\hat{a}(\tau_t, G_t) = \left(I - \frac{p(k_t)R}{1+r} \right) \frac{1}{1-\tau_t}} \tag{CC}$$

$$\boldsymbol{1 - G_t(\hat{a}(\tau_t, G_t)) = \bar{e}} \tag{PE}$$

back to main

$t = 0$

- MPS: cdf satisfies *single-crossing* (Rothschild and Stiglitz, 1971, JET).



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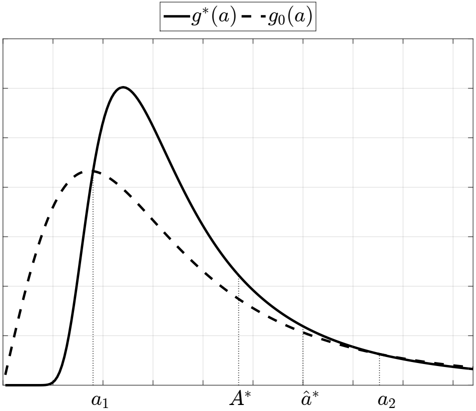
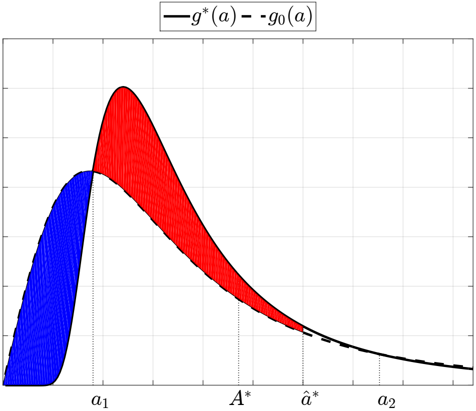


$t = 0$

- MPS: cdf satisfies *single-crossing* (Rothschild and Stiglitz, 1971, JET). go back



1. More entrepreneurs: $e(\tau^*, G_0) > e(\tau^*, G^*)$

$t = 0$

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$t = 0$

1. More entrepreneurs: $e(\tau^*, G_0) > e(\tau^*, G^*)$
2. Higher collateral: $\hat{a}(\tau^*, G_0) > \hat{a}(\tau^*, G^*)$

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2. Higher collateral: $\boldsymbol{\hat{a}(\tau^*, G_0) > \hat{a}(\tau^*, G^*)}$

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2. Higher collateral: $\hat{a}(\tau^*, G_0) > \hat{a}(\tau^*, G^*)$

1. More entrepreneurs: $e(\tau^*, G_0) > e(\tau^*, G^*)$
2. More capital: $K(\tau^*, G_0) > K(\tau^*, G^*)$

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3. Lower price: $p(\tau^*, G_0) < p(\tau^*, G^*)$

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2. More capital:	$K(\tau^*, G_0) > K(\tau^*, G^*)$
3. Lower price:	$p(\tau^*, G_0) < p(\tau^*, G^*)$
4. Lower profits:	$\Pi(\tau^*, G_0) < \Pi(\tau^*, G^*)$

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2.	More capital:	$K(\tau^*, G_0) > K(\tau^*, G^*)$
3.	Lower price:	$p(\tau^*, G_0) < p(\tau^*, G^*)$
4.	Lower profits:	$\Pi(\tau^*, G_0) < \Pi(\tau^*, G^*)$
5.	Higher collateral:	$\boldsymbol{\hat{a}(\tau^*, G_0) > \hat{a}(\tau^*, G^*)}$

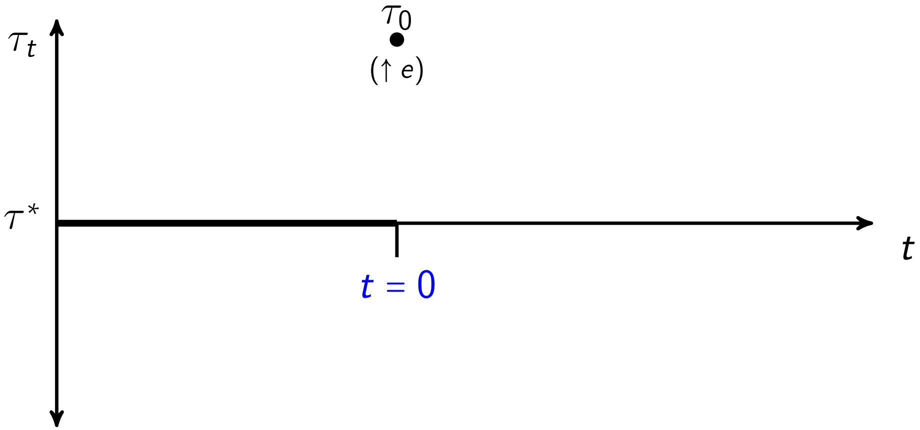
$t = 0$

1. **More entrepreneurs:** $e(\tau^*, G_0) > e(\tau^*, G^*)$
2. Higher collateral: $\hat{a}(\tau^*, G_0) > \hat{a}(\tau^*, G^*)$

Higher pressure for a more **pro-business** policy

$$\tau_0 > \tau^*$$

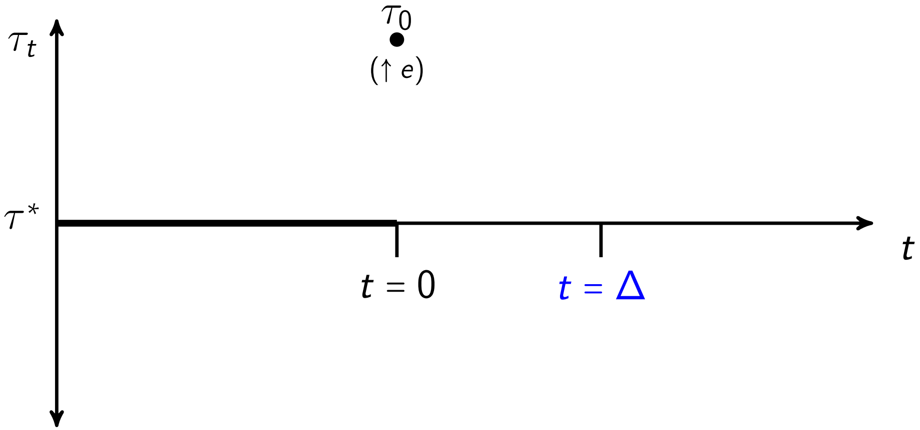
$t = 0$



G_0: constrained $(A^* < \hat{a}^*)$ and unequal.

back to main

$t = \Delta$



G_0: constrained $(A^* < \hat{a}^*)$ and unequal.

$t = \Delta$

1. Less entrepreneurs: $\boldsymbol{e(\tau_0, G_\Delta) < e(\tau_0, G_0)}$

$t = \Delta$

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   1. $\tau_0 > \tau^* \Rightarrow$ agents dissave at $t = 0$

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    2. G shifts to the left. (G_0 FOSD G_Δ)

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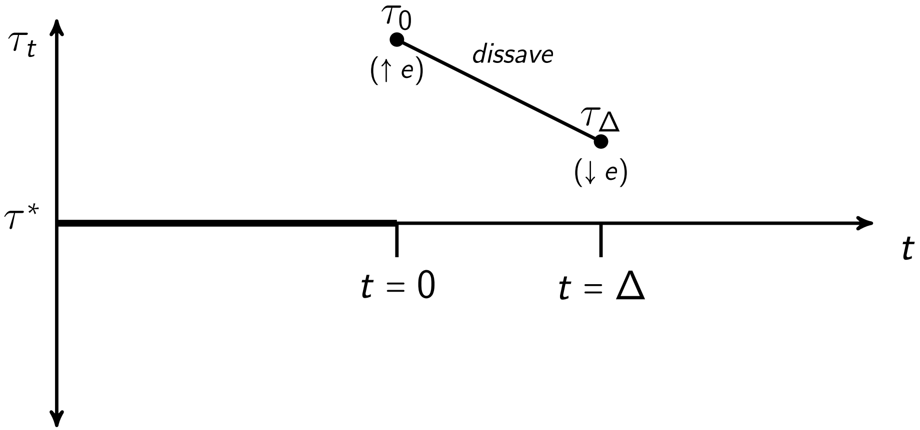
1. **Less entrepreneurs:** $e(\tau_0, G_\Delta) < e(\tau_0, G_0)$
2. Lower collateral: $\hat{a}(\tau_0, G_\Delta) < \hat{a}(\tau_0, G_0)$

Higher pressure for a more **pro-worker** policy

$$\tau_\Delta < \tau_0$$

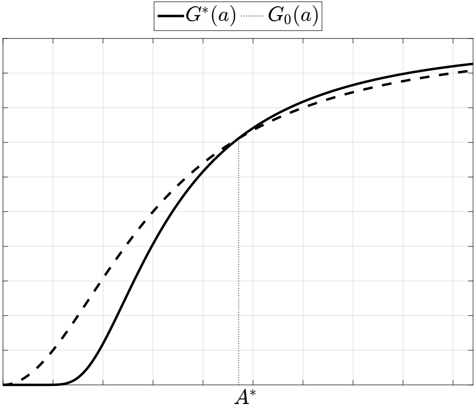
$t = \Delta$



G_0: constrained $(A^* < \hat{a}^*)$ and unequal.

back to main

MPS: cdf



1. *Single-crossing* (Rothschild and Stiglitz, 1971, JET)
2. *Crossing at the mean* (Fischer and Huerta, 2021, JPubE) back to main