Discussion of "Consumption-led Industrial Upgrading"

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THIS PAPER

- **Goal**: a macro-development growth model for understanding the drivers of technology progress and industrial upgrading in a catching-up economy
  - catching-up: innovation is cost reduction instead of new variety creation
- **Key contributions**

1. a dynamic model with capital accumulation $\{N(t), J(t)\} \rightarrow \{K(t), N(t), J(t)\}$
   - new insights: capital constraint & technology constraint
   - hump-shaped saving function
2. crucial difference between CE and SP
   - time-varying effects of externality
   - important policy implications

Key Model Elements

- **consumption frontier**

$$c_t = \frac{s^2}{2}\left[\frac{1}{1-\gamma} - \alpha\left(\frac{n_t}{J_t}\right)\right] n_t^{1-\gamma}$$

- **technology frontier**

$$\varphi\left(j|J_t\right) = \begin{cases} j^{\theta} & \text{if } j \geq J_t \\ j^{\theta}\left[1 - \lambda\left(1 - \frac{j}{J_t}\right)^{1+\nu}\right] & \text{if } j < J_t \end{cases}$$

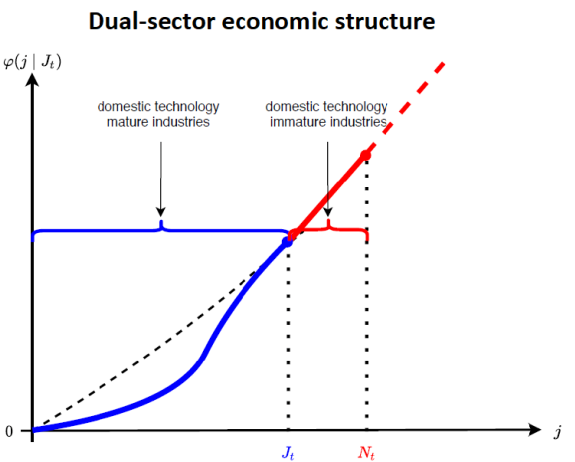
- **innovation process**

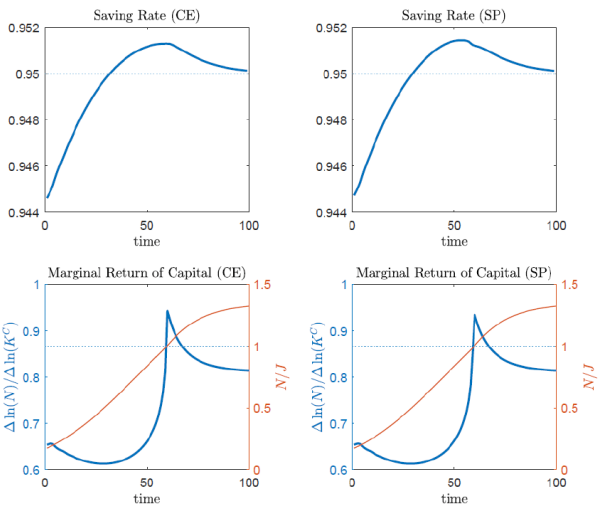
$$J_{t+1} = (1-\delta)\, J_t + z N_t^{\epsilon} J_t^{1-\epsilon}$$

- **tradeoff in allocation between consumption and saving**

$$s\omega\left(\frac{n_t}{J_t}\right) J_t^{1+\theta} + \frac{s_{t+1}}{R_t} \leq s_t$$

Key Mechanism





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3. cost-reduction → market concentration (Kwon, Ma, and Zimmermann, 2023)

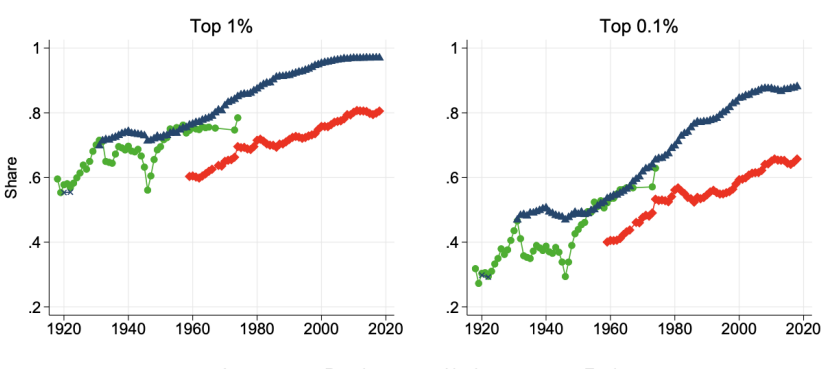

Figure 1. Top 1% and 0.1% Shares: All Corporations

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- **In reality**: also common in advanced economies
- **Key innovation dilemma**: (inappropriate) foreign technology adoption v.s. self innovation
  - **inappropriate technology hypothesis**: frontier innovators focus on developing technology that matches their own local conditions and characteristics (Stewart, 1978; Basu and Weil, 1998; Acemoglu and Zilibotti, 2001)

Comment #2: Baseline Endowment Economy

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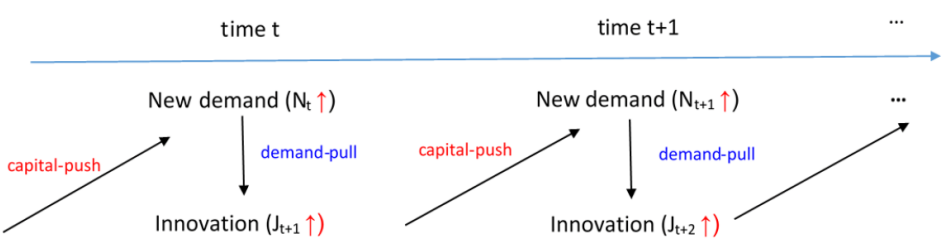

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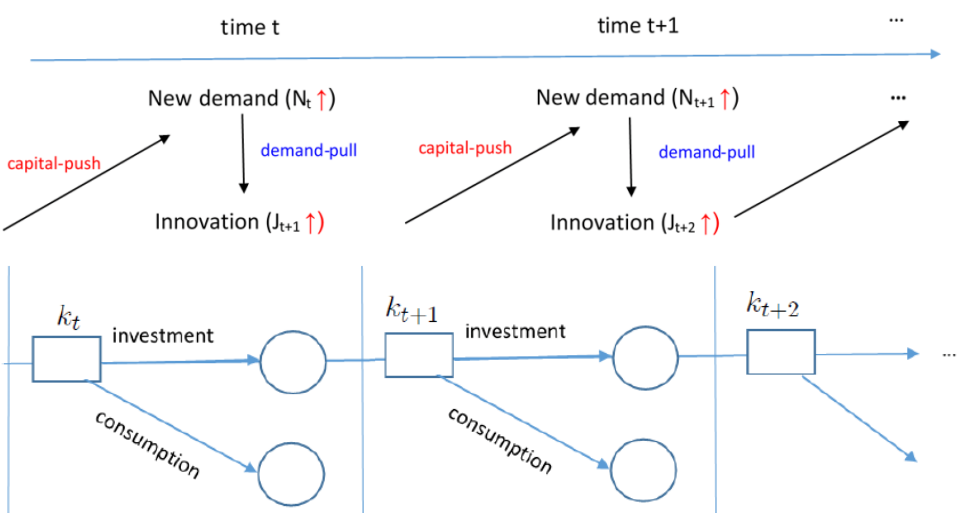

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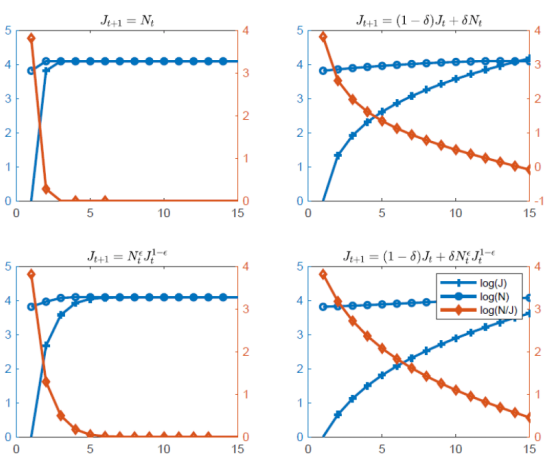
1. endowment economy, but the key new insights come from endogenous capital accumulation
2. a more "confusing" figure on the dynamic feedback
3. one important takeway here is not being discussed later in the full model: income effect v.s. substitution effect



Comment/Question #3: Intertemporal Decision

- **Investment goods producers**

$$\max_{k_{t+1} \geq 0} \{k_{t+1} - \phi_i k_{t+1} R_t\}$$

$\rightarrow$ **constant** intertemporal capital rental rate $R_t = \frac{1}{\phi_i}$

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? but we are interested in **transitional dynamics**

- OK for nonproductive final goods, but capital is a productive factor
- this paper: capital is output

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- **Suggestions**

1. more discussions on the impacts of different $\frac{\phi_i}{\beta}$ values
2. extension with an endogenous intertemporal rental rate: consumption Euler equation

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- **Suggestions**

? Another question:

> **Consumption Goods Producers** The supply of consumption goods is competitive: for every consumption variety j, there is a unit measure of identical firms which rent capital from households as input to produce to maximize profit
>
> $$\max_{y_{jt} \geq 0} \{p_{jt} y_{jt} - \varphi(j|J_t) y_{jt}\}, \tag{4}$$

Comment #4: Parameterization

parameters	symbols	values
discount	β	0.9500
consumption limit	s	1.0000
hierachy utility	γ	0.5000
tech depreciation	δ	0.0500
tech share	ϵ	0.7000
tech learning effi	z	0.0600
tech gap	λ	0.9000
mc increasing	θ	0.0010
elas sub	σ	1.0000
mc investment	φ_i	0.9000

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- **More discussions on the choice of these parameter values**

We numerically solve the model by using the endogenous grid method (Caroll (2006)). Specifically, we iterate the Euler equation and the detailed solution method is described in the appendix. The following table reports the set of parameter values used to solve the model. The set of parameter values implies that the model has a steady state $\tilde{N}$ of 1.08.

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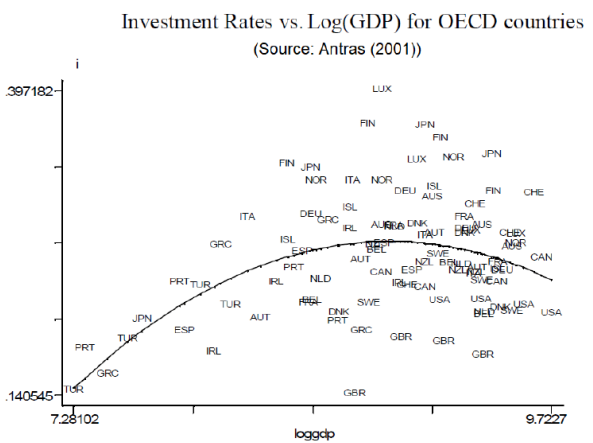
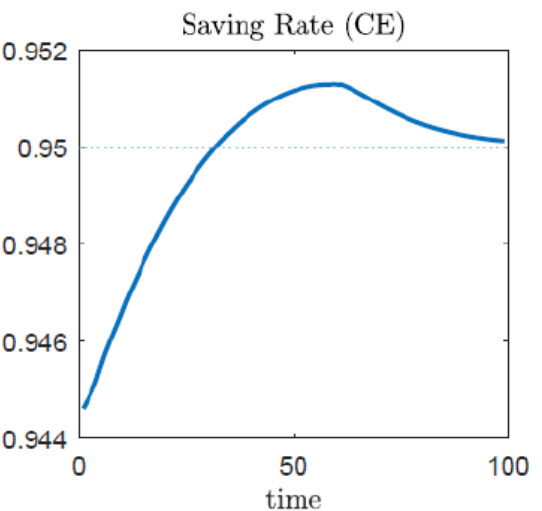
- **More discussions on the choice of these parameter values**
- **Additional sensitivity analysis**
  - σ: incentives of consumption smoothing
  - $\frac{\beta}{\phi_i}$: shrinking economy or booming economy
  - is hierachy utility necessary? ($\gamma = 0$)
  - parameters affecting the relative importance income effect versus substitution effect

COMMENT #5: HUMP-SHAPED SAVING

- **Quantitative importance**





Comment #5: Hump-Shaped Saving

- **Quantitative importance**
- **Policy recommendation**: suppressing consumption and enhancing capital accumulation in the early stage while reversing the sign in a later stage
  - subtle difference: consumption is R&D-like

Comment #5: Hump-Shaped Saving

- **Quantitative importance**
- **Policy recommendation**: suppressing consumption and enhancing capital accumulation in the early stage while reversing the sign in a later stage
- **Timing in terms of economic development level** (e.g., log GDP): a full quantitative exploration

Minor Comments

1. **Growth traps extension**: too ad hoc
   - transitional path matters for its long-run growth

$$\varphi_{it} = \begin{cases} \varphi_i & & \text{for } t \leq t^* \\ \varphi_i & \text{if } J_{t^*} < \bar{J} & \text{for } t > t^* \\ \varphi_i^L & \text{if } J_{t^*} \geq \bar{J} & \end{cases},$$

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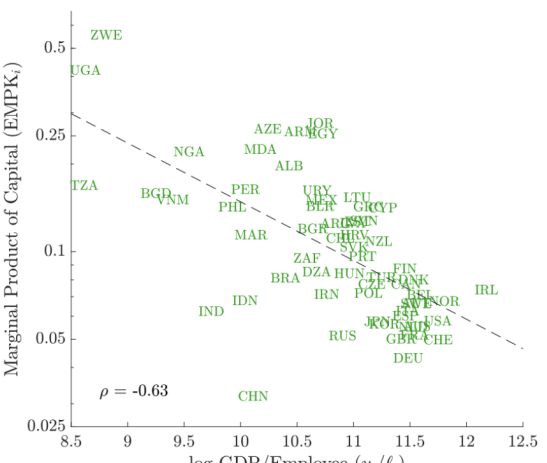

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3. Matsuyama (2002): interesting to explore the role of **wealth distribution**
4. **Title** "consumption-led industrial upgrading" doesn't capture the new insights from this paper

SUMMARY

- **A great paper!**
- Important question, interesting model mechanism, smart model setup, insightful policy recommendations, ...
- **Good luck with the publication!**