

# Intangibles, Inequality and Stagnation

NOBUHIRO KIYOTAKI & SHENGXING ZHANG

Discussion by Franck Portier  
University College London

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# 0. Introduction

- ▶ Observations :
  - × Rising inequalities
  - × Slower productivity growth
  - × Worsening of young workers labor market outcomes
- ▶ Possible link : accumulation of intangible (human) capital

# Roadmap

1. A Simple Model
2. Comments

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# 1. A Simple Model

## Environment

- ▶ 2 periods, 0 and 1
- ▶ Continuum of agents of measure 1
- ▶  $U(c_{0i}, c_{1i})$
- ▶ Good endowment :  $e_i$  in period 0
- ▶ Time endowment : 1 unit per agent per period
- ▶ Small open economy, fixed interest factor  $R$ .

# 1. A Simple Model

## Technology

- ▶ Final good production  $Y = F(L, K)$ 
  - ×  $L$  : routine worker total time
  - ×  $K$  : total managerial skill
- ▶ Managerial skill production :
  - × put 1 unit of time and  $\bar{e}$  in period 0
  - × Obtain  $k_i$  (cdf  $\Phi$ ) in period 1, that is operated with one's unit of time (cannot be manager *and* routine worker)
- ▶ Note : no  $K$  in period 0 (or some endowed amount)
- ▶ No uncertainty

# 1. A Simple Model

## Markets

- ▶ Competitive markets for final good and for inputs
- ▶ Final good :  $p = 1$
- ▶ Routine worker wage :  $w_0, w_1$
- ▶ Managerial skills return :  $z$

# 1. A Simple Model

## Agents decisions

- ▶ Agents make two decisions in period 0
  - × Occupation decision : Routine worker the two periods *or* trainee in period 0 and manager in period 1
  - × Consumption/Saving decision: how to allocate wealth over the two periods
- ▶ Frictions on the credit market
  - × Routine worker wage is fully pledgable
  - × Managerial skills are only up to a fraction  $(1 - \theta)$

$$c_{0i} \leq e_i - \bar{e} + (1 - \theta)zk_i$$



# 1. A Simple Model

Even simpler

- ▶  $U = \ln c_0 + c_1$
- ▶  $R = 1$
- ▶  $e_i = \bar{e}$
- ▶  $F(L, K) = L + \alpha_k K$

# 1. A Simple Model

Consumption/saving problem

- ▶ Routine workers :

$$\begin{aligned} \max \quad & \ln c_0 + c_1 \\ \text{s.t.} \quad & c_0 + c_1 = W \end{aligned}$$

- ▶ Solution

$$\begin{cases} c_0 = 1 \\ c_1 = W - 1 \end{cases}$$

- ▶  $W = \bar{e} + \underbrace{w_0}_1 + \underbrace{w_1}_1$

# 1. A Simple Model

Consumption/saving problem

- ▶ Trainees/Managers :

$$\begin{aligned} \max \quad & \ln c_0 + c_1 \\ \text{s.t.} \quad & c_{0i} \leq (1 - \theta)z k_i \\ & c_{0i} + c_{1i} = \underbrace{z}_{\alpha_k} k_i \end{aligned}$$

- ▶ Unconstrained solution :

$$\begin{cases} c_{0i} = 1 \\ c_{1i} = \alpha_k k_i - 1 \end{cases}$$

(assume  $k_{\min} = 1/\alpha_k$ )

- ▶ Constrained solution :

$$\begin{cases} c_{0i} = (1 - \theta)\alpha_k k_i \\ c_{1i} = \theta\alpha_k k_i \end{cases}$$

(assume  $k_{\max} = 1/(1 - \theta)\alpha_k \rightsquigarrow$  all trainees are constrained)

# 1. A Simple Model

## Consumption/saving problem

- ▶ Trainees/Managers : When constrained, we have

$$\frac{c_{0i}}{c_{1i}} = \frac{1 - \theta}{\theta} < \frac{1}{\alpha_k k_i - 1}$$

- ▶ Lack of consumption smoothing :  $\frac{c_{0i}}{c_{1i}}$  too low.
- ▶ An increase in  $\theta$  decreases  $\frac{c_{0i}}{c_{1i}}$  even further

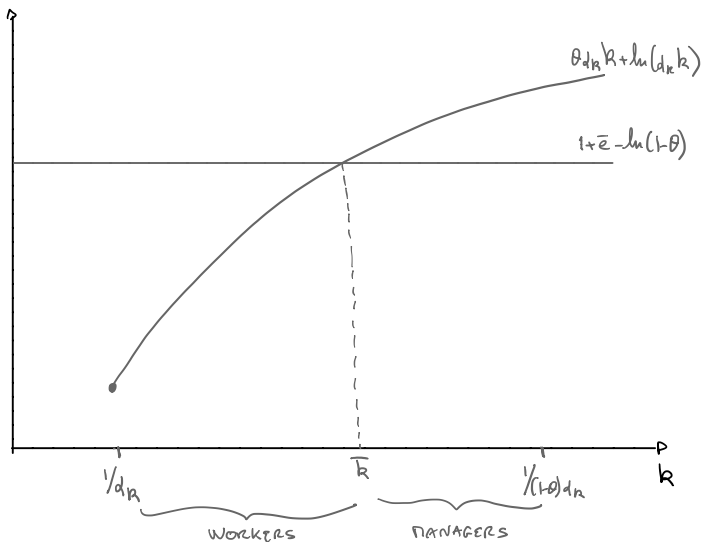
# 1. A Simple Model

Occupation decision

- ▶  $U_R = \ln 1 + 1 + \bar{e} = 1 + \bar{e}$
- ▶  $U^M = \ln((1 - \theta)\alpha_k k_i) + \theta\alpha_k k_i$
- ▶  $i$  decides to be a manager if  $U^M(k_i) \geq U_R \rightsquigarrow$  threshold  $\bar{k}$

# 1. A Simple Model

Occupation decision



# 1. A Simple Model

Threshold  $\bar{k}$  with technological "slowdown"

- ▶  $\bar{k}$  implicitly defined by

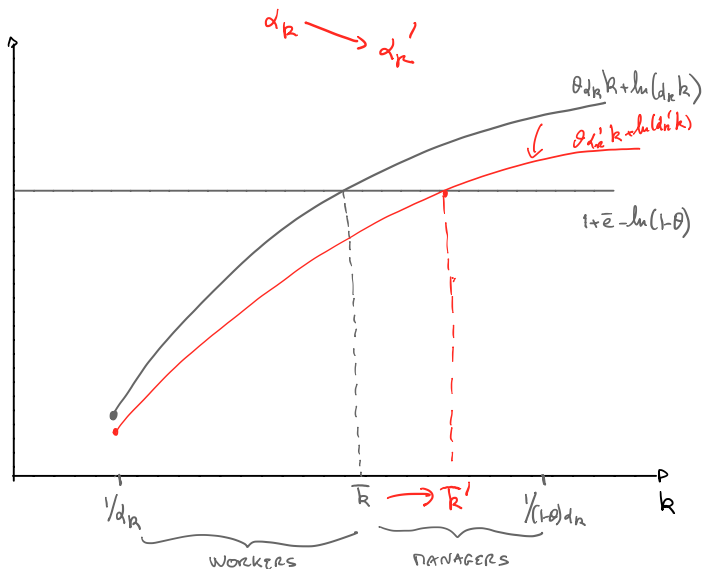
$$\theta \alpha_k \bar{k} + \ln(\alpha_k \bar{k}) = 1 + \bar{e} - \ln(1 - \theta)$$

- ▶ from which we obtain
  - × Technological "slowdown":

$$\frac{\partial \bar{k}}{\partial \alpha_k} = -\frac{\bar{k}}{\alpha_k} < 0$$

# 1. A Simple Model

Threshold  $\bar{k}$  with technological "slowdown"





# 1. A Simple Model

Threshold  $\bar{k}$  comparative statics with a decrease in Managerial skills specificity

- ▶  $\bar{k}$  implicitly defined by

$$\theta\alpha_k\bar{k} + \ln(\alpha_k\bar{k}) = 1 + \bar{e} - \ln(1 - \theta)$$

- ▶ from which we obtain

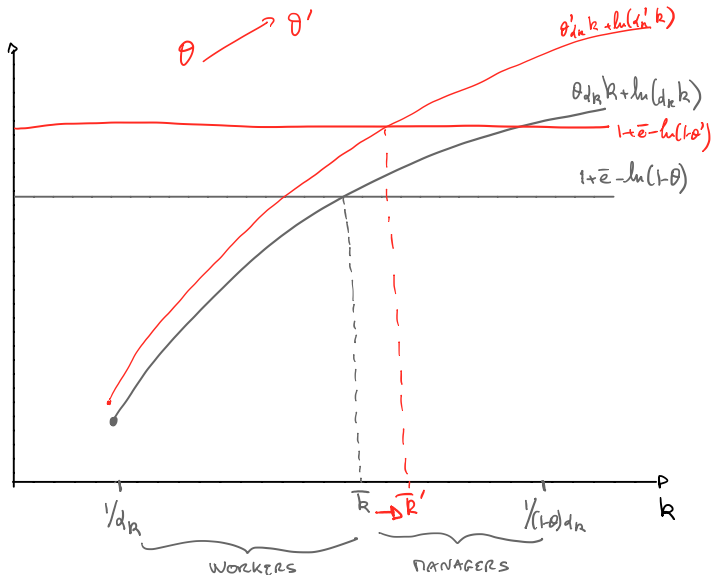
- × Decrease in Managerial skills specificity:

$$\frac{\partial \bar{k}}{\partial \theta} = \left[ \alpha_k \theta + \frac{1}{\bar{k}} \right]^{-1} \times \left[ \frac{1 - (1 - \theta)\alpha_k \bar{k}}{1 - \theta} \right] > 0$$

as long as  $(1 - \theta)\alpha_k \bar{k} < 1$ , which is true under our assumption that trainees/managers are always constrained.

# 1. A Simple Model

Threshold  $\bar{k}$  with a decrease in Managerial skills specificity



# 1. A Simple Model

## Comparative statics

- ▶ Following a decrease in  $\alpha_k$  (“secular stagnation”) or an increase in  $\theta$  (less commitment),
  - × Decrease in output (  $\alpha_k, \theta$  )
  - × Less consumption smoothing ( $\theta$ )
  - × More inequalities
  - × Worsening of young agents consumption.

# 1. A Simple Model

Adding heterogeneity in  $e_i$

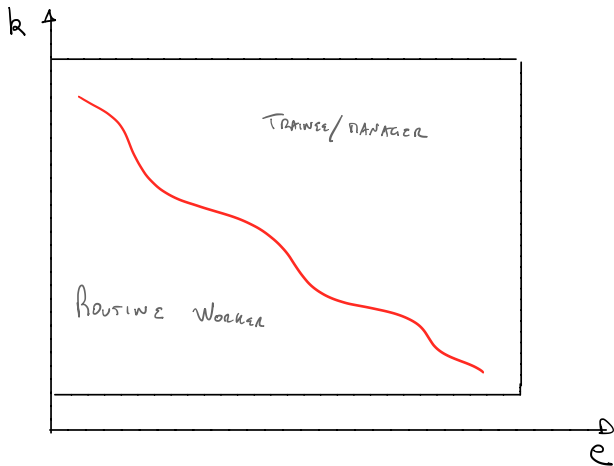
- ▶  $e_i$  has a cdf  $\Psi$
- ▶ Assume  $e_{\max} = \bar{e}$
- ▶ Routine workers :  $W = e_i + 2$
- ▶ Constrained managers :

$$\begin{cases} c_{0i} = (1 - \theta)\alpha_k k_i + (e_i - \bar{e}) \\ c_{1i} = \theta\alpha_k k_i - (e_i - \bar{e}) \end{cases}$$

# 1. A Simple Model

Adding heterogeneity in  $e_i$

- Occupational choice :



# 1. A Simple Model

Adding heterogeneity in  $e_i$

- ▶ A small difference in initial endowment and ability of young workers leads to a large inequality in accumulation of intangibles and lifetime income.

# Roadmap

1. A Simple Model
2. Comments

## 2. Comments

- ▶ Neat and elegant
- ▶ Is the main mechanism (holdup problem) realistic?
  - × Show evidence of non-competition clauses in labor contracts
  - × Contribution to Japan “lost decade”, secular stagnation and rises in inequalities : still an open question.



## 2. Comments

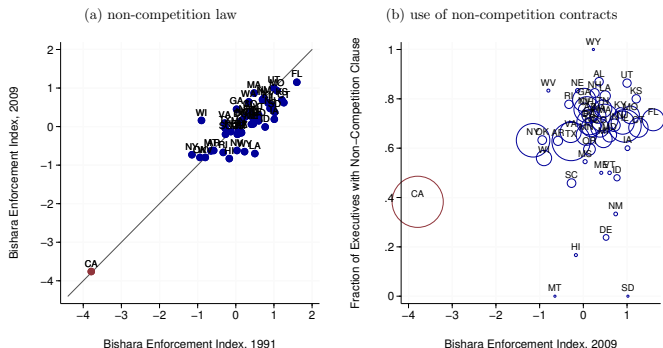
Liyan Shi [2017]

- ▶ JMP: *“Restrictions on Executive Mobility and Reallocation: The Aggregate Effect of Non-Competition Contracts”*
- ▶ Shi scraps non-competitive clauses in labor contracts.
- ▶ Over 60% of executives employed in public firms in the U.S. have signed contracts that include non-competition clauses.
- ▶ Legal disparities cross US states:
  - × Statutory ban in California
  - × Permissive stance in Florida

## 2. Comments

Lyan Shi [2017]

Figure 2: Differences in non-competition law and contracts across states

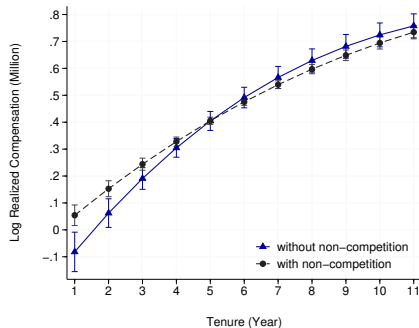


Notes: The figure in Panel (a) plots the Bishara enforcement index for the year 1991 and 2009. The two years roughly cover the beginning and end years of the executive data sample (1992 to 2015). The figure in Panel (b) plots the fraction of executives with non-competition clauses against the Bishara enforcement index in 2009. The size of the circles represents the total number of firm-executive matches in the state where the company headquarter is located.

## 2. Comments

Lyan Shi [2017]

Figure 3: Wage-backloading by whether under non-competition



*Notes: This figure plots wage over tenure by whether the executive is subject to non-competition, based on the marginal effects at means in the baseline regression in column (1) of Table 3. The bars display 95% confidence interval.*

## 2. Comments

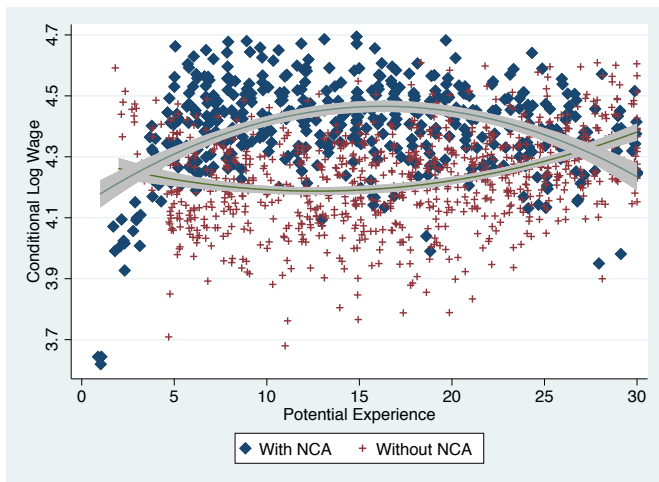
Lavetti, Simon & White [2017]

- ▶ “ *The Impacts of Restricting Mobility of Skilled Service Workers: Evidence from Physicians* ”
- ▶ Survey of physicians linking the use of non-compete agreements to labor market outcomes and firm performance

## 2. Comments

Lavetti, Simon & White [2017]

Figure 1: Cross-Sectional Wage Profiles, by Experience



## 2. Comments

Lavetti, Simon & White [2017]

- ▶ Non-compete agreements deters the poaching of patients
- ▶ Non-compete agreements allow allocate clients to new physicians through intra-firm patient referrals, reducing a form of investment holdup ( $\approx$  reduction in  $\theta$ )
- ▶ NCAs increase the rate of return to job-tenure, with larger effects in states with more enforceable NCA laws.

