

Structural Transformation Across Organizations

Tommaso Porzio

Columbia Business School

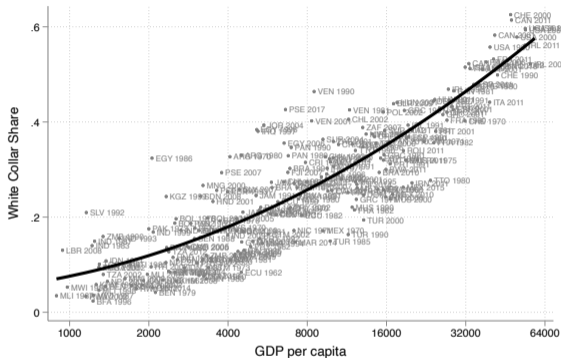
STEG-PEDL Virtual Course on “Private Enterprises, Productivity, and Economic Growth”

Introduction

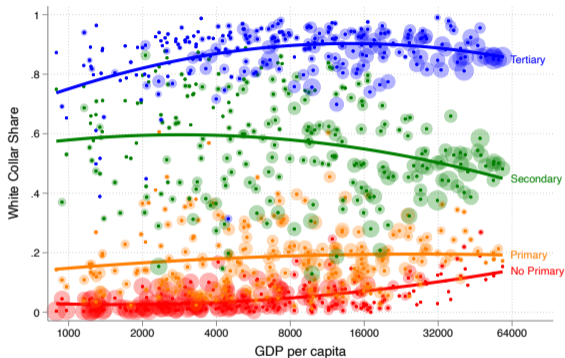
- ▶ Typical view of structural change: movement from **agriculture** to **manufacturing** to **services**
- ▶ Today: structural transformation **across organizations**
 - ▶ From self-employment into firms
 - ▶ From simple production units to organizations with managers, professionals, and workers
- ▶ Quick overview of two projects:
 - 1 **Self-employment within the firm**: there is even more self-employment than we thought
 - 2 **Economic development according to Chandler**: one reason LICs have few big firms is lack of skills

1. Facts on Structural Transformation Across Organizations

Key Role of Human Capital (Engbom et al., 2025)



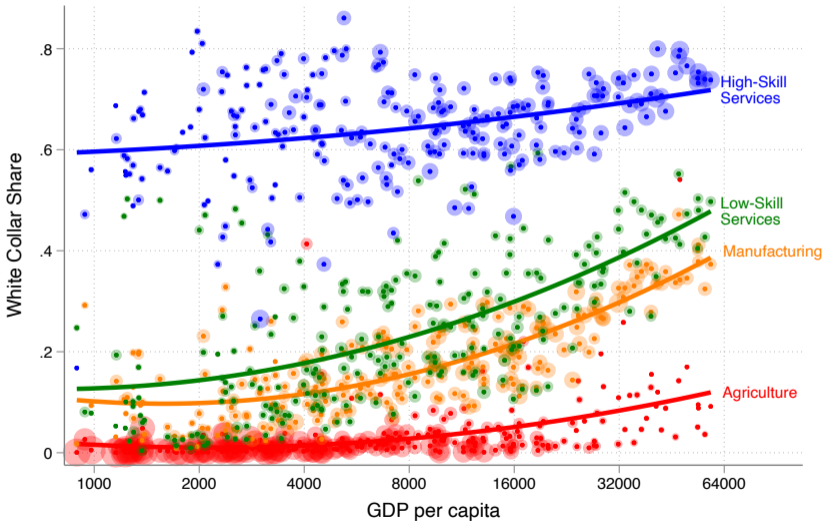
Aggregate white collar share



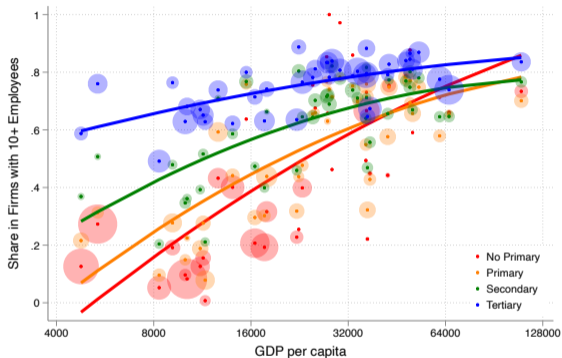
White collar share by education

- ▷ The white-collar gap is almost fully accounted for by **human capital**
- ▷ Conditional on education, white-collar employment looks much more similar across countries

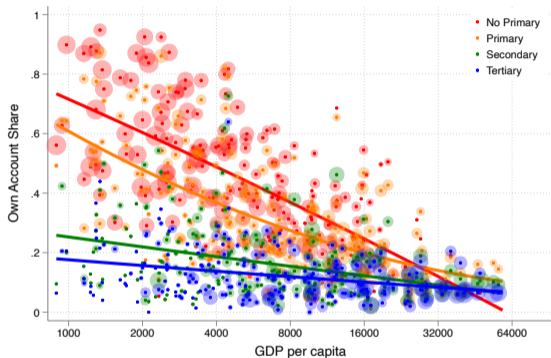
The White-Collar Shift Happens Within Sectors (Engbom et al., 2025)



Development Pulls Low-Skilled Workers into Firms (Engbom et al., 2025)



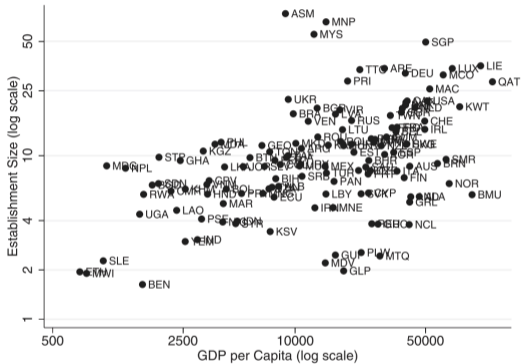
Share in large firms



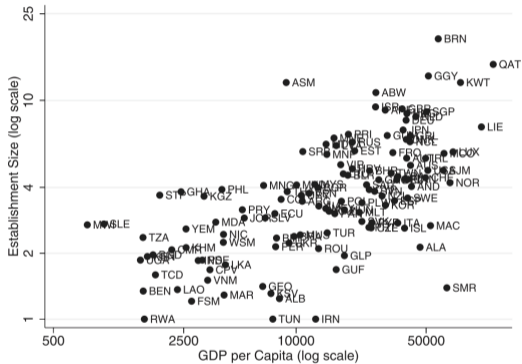
Share in own account

- ▷ High-skilled workers are in firms in almost every country
- ▷ Low-skilled workers move from self-employment to blue-collar work in larger firms

Firms Are Small in Low-Income Countries (Bento and Restuccia, 2021)



(a) Manufacturing



(b) Services

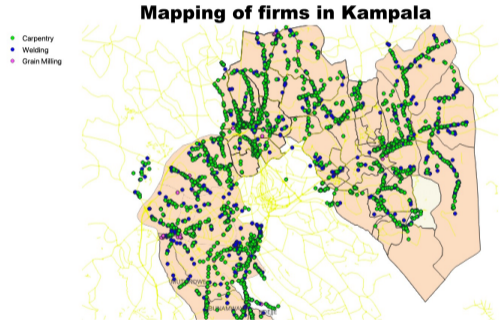
2. Self-Employment Within the Firm

How Are Small Firms Internally Organized?

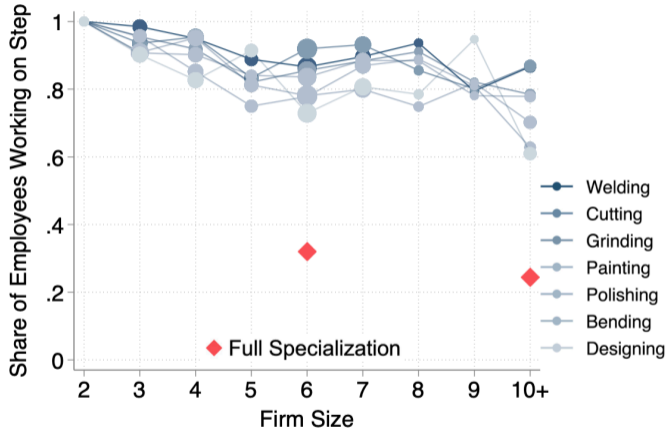
Vittorio Bassi, Jung H. Lee, Alessandra Peter, Tommaso Porzio, Ritwika Sen, Esau Tugume

A Survey Designed to See Inside Firms (Bassi et al., 2025)

- ▶ Representative survey of roughly 1,000 SMEs
- ▶ Furniture, metal products, and grain milling
- ▶ Measure **who does what** inside the firm
 - ▶ time-use diaries for entr. and employees
 - ▶ production steps for core products
 - ▶ non-production and complex tasks

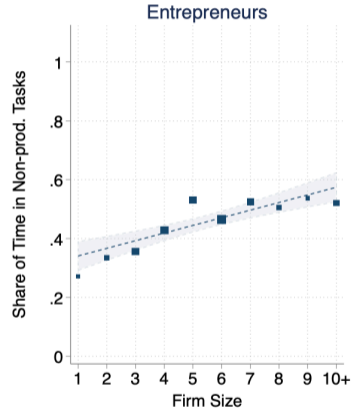
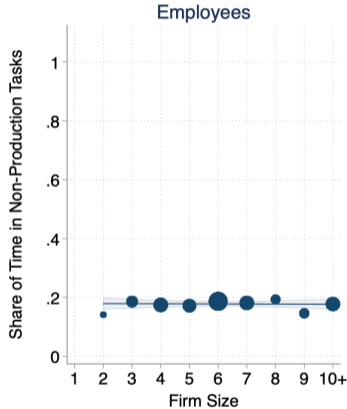


Little Horizontal Specialization Within Firms (Bassi et al., 2025)



- ▶ Workers commonly perform many production steps, even in larger firms

Limited Vertical Specialization Within Firms (Bassi et al., 2025)

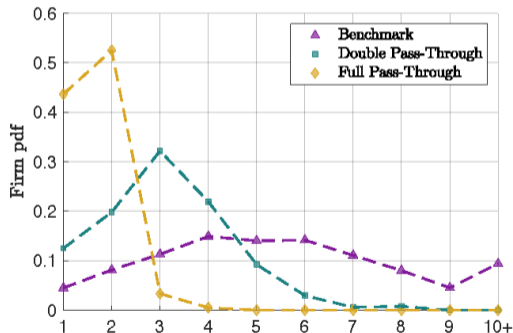


- ▷ Entrepreneurs spend lots of time working, not managing

Takeaway: Firms Are (Even) Smaller than They Seem!

- ▶ Ugandan manufacturing firms look close to collections of self-employed individuals
- ▶ Small gains from aggregating labor in “workshop-style” firms
- ▶ Lack of specialization limits pass-through from entrepreneur talent to worker productivity
- ▶ Development may require **different firms**, not only larger versions of existing ones

(c) Firm Size Distribution (Constant Net Output)



3. Economic Development According to Chandler

Skills and the Rise of Large Firms

Nik Engbom, Hannes Malmberg, Tommaso Porzio, Federico Rossi, Todd Schoellman

Economic Development According to Chandler

- ▶ Chandler: hierarchies of **white-collar workers** allow firms to scale up
- ▶ Development question: why are large firms rare in low-income countries?
- ▶ Answer we explore: lack of skills limits the reorganization of production
- ▶ Framework: **Lucas model with endogenous decreasing returns to scale**

Environment

- ▷ Economy organized into multiple sectors j
- ▷ Within each sector, three occupations: laborer, professional, entrepreneur
- ▷ Workers' endowments: skill z & type-I extreme value tastes for each sector j
- ▷ Three choices
 - 1 Entrepreneur's choice of how to structure firms
 - 2 Occupational choice
 - 3 Sectoral choice

Entrepreneur's Problem

▷ Production inputs:

▷ Entrepreneur's skill z

▷ Total output:

$$y_j =$$

$$A_j z$$

Entrepreneur's Problem

- ▶ Production inputs:
 - ▶ Entrepreneur's skill z
 - ▶ Undifferentiated production tasks, performed by laborers

- ▶ Total output:

$$y_j = A_j z n_j^{\gamma_{l,j}}$$

Entrepreneur's Problem

- ▶ Production inputs:
 - ▶ Entrepreneur's skill z
 - ▶ Undifferentiated production tasks, performed by laborers
 - ▶ Continuum of administrative tasks i performed by entrepreneurs or professionals

$$\tilde{n}(i) = \max \left\{ \underbrace{1}_{\text{Entrepreneur}}, a_j(i) \underbrace{n_p(i)}_{\text{Professionals}} \right\}$$

- ▶ Total output:

$$y_j = A_j z n_l^{\gamma_{l,j}} \exp \left(\int_0^1 \log \tilde{n}(i)^{\gamma_{p,j}} di \right)$$

Entrepreneur's Problem

- ▶ Production inputs:
 - ▶ Entrepreneur's skill z
 - ▶ Undifferentiated production tasks, performed by laborers
 - ▶ Continuum of administrative tasks i performed by entrepreneurs or professionals

$$\tilde{n}(i) = \max \left\{ \underbrace{1}_{\text{Entrepreneur}}, a_j(i) \underbrace{n_p(i)}_{\text{Professionals}} \right\}$$

- ▶ Total output:

$$y_j = \underbrace{\exp \left(\int_0^1 \log \tilde{n}(i)^{-\tau \gamma_{p,j}} di \right)}_{\text{Wedge}} A_j z n_l^{\gamma_{l,j}} \exp \left(\int_0^1 \log \tilde{n}(i)^{\gamma_{p,j}} di \right)$$

Entrepreneur's Problem (Equivalence)

- ▶ **Equivalently**: choose share of admin **tasks** q to professionalize & labor quantities:

$$\pi(q, n_p, n_l) = z\tilde{A}(q) \left[n_p^{\alpha(q)} n_l^{1-\alpha(q)} \right]^{\eta(q)} - qw_p n_p - w_l n_l$$

where q implicitly determines productivity, factor shares and **returns to scale**

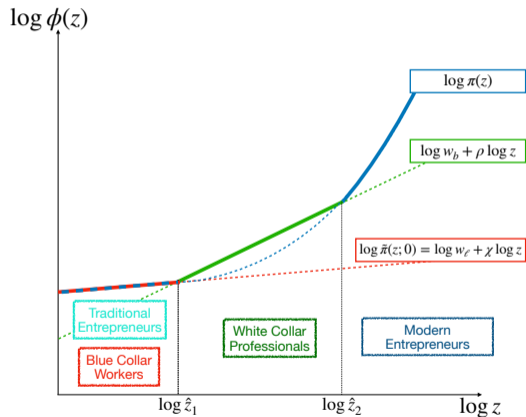
$$\tilde{A}(q) \equiv A \times \left(\exp \frac{1}{q} \int_0^q \log a(i)^{\gamma_p(1-\tau)} di \right)^q$$

$$\alpha(q) \equiv \frac{q\gamma_p(1-\tau)}{\eta(q)}$$

$$\eta(q) \equiv q\gamma_p(1-\tau) + \gamma_l$$

- ▶ **Key result**: skilled entrepreneurs choose high q and structure firms in more skill-intensive ways

Equilibrium Occupational Choice

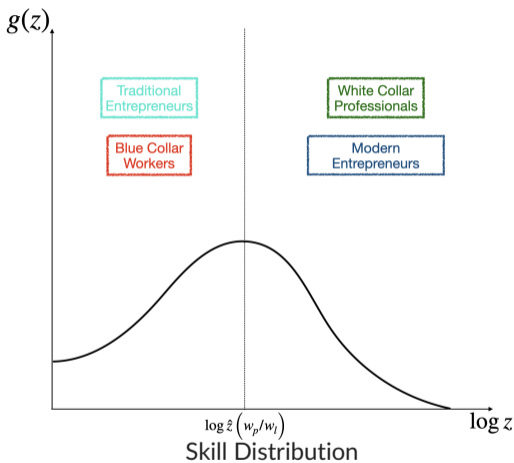
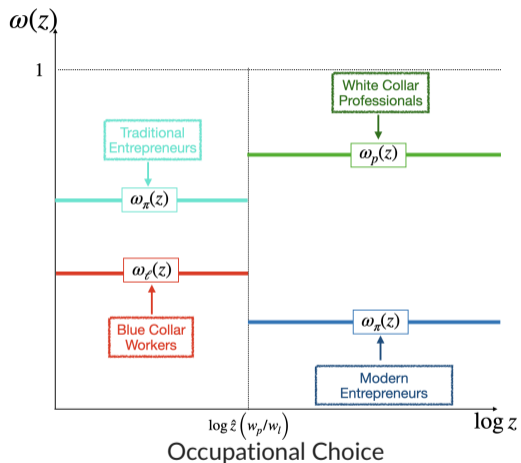


- ▶ Workers choose between laborer, professional, and entrepreneur
- ▶ High-skill workers have comparative advantage in professional and modern entrepreneurial roles
- ▶ Traditional entrepreneurship is the reserve option for many workers

Illustrate Connection Skills-Type of Firms in Simplified Environment

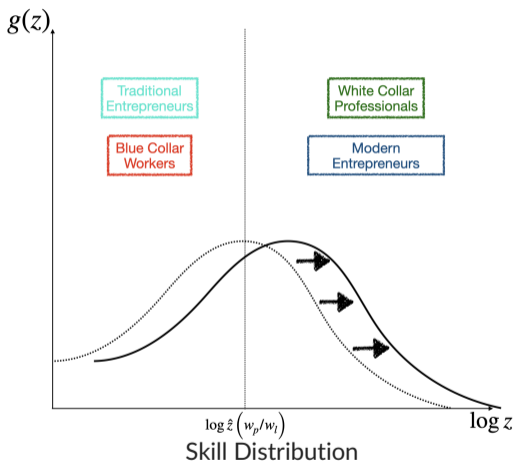
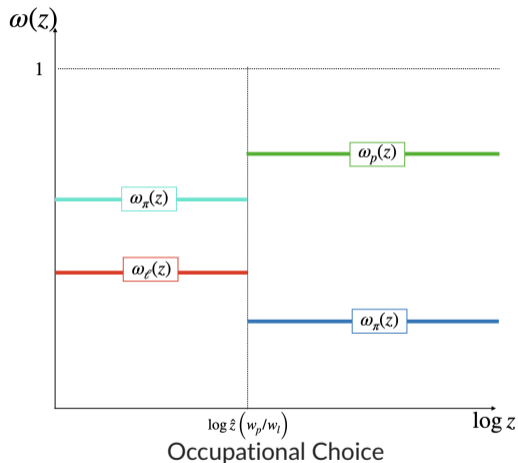
- ▷ **Environment:** one sector, traditional and modern firms, and skill-intensive professional tasks
- ▷ **Exercise:** shift exogenously the skill distribution and see how the economy re-organizes

What Happens When Skill Supply Expands?



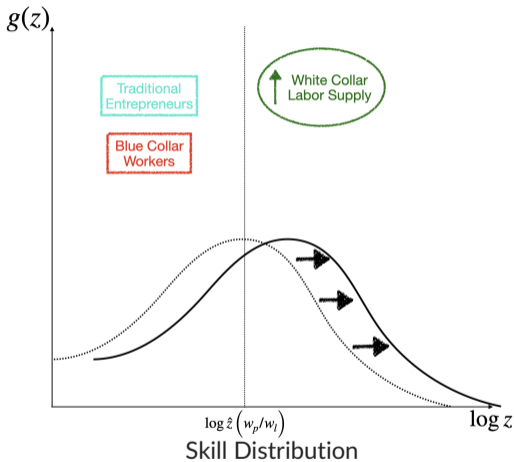
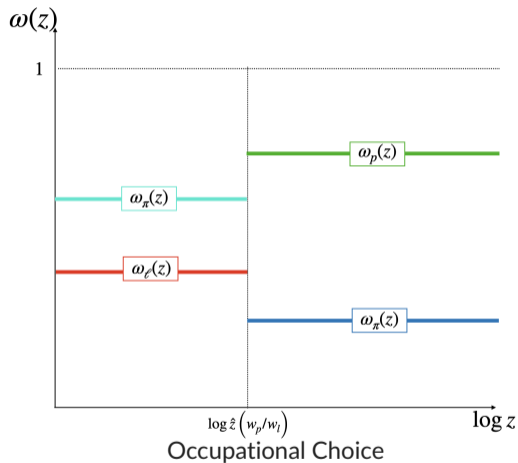
Start from an equilibrium with duality: some modern, some traditional entrepreneurs

What Happens When Skill Supply Expands?

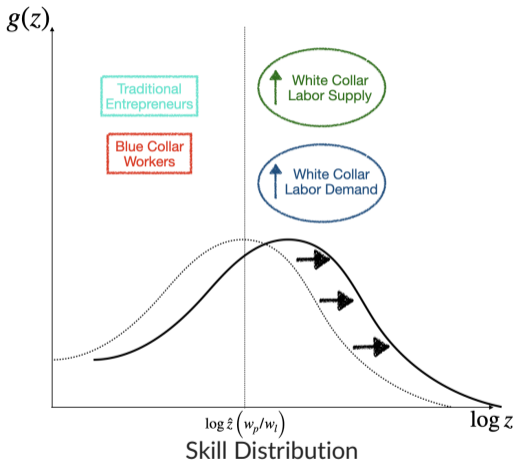
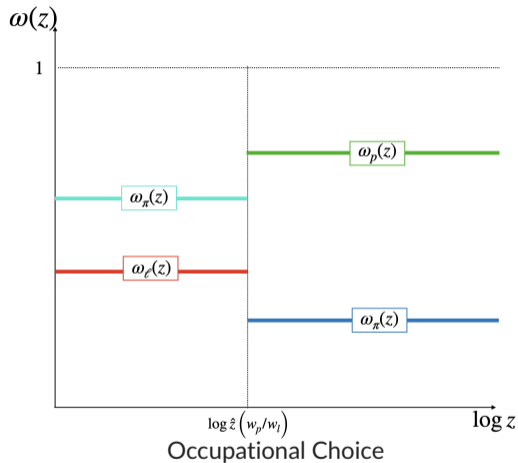


Shift the skill distribution to the right – e.g. increase in educational attainment

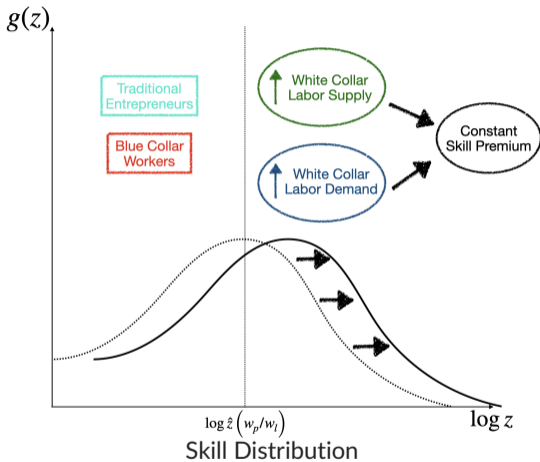
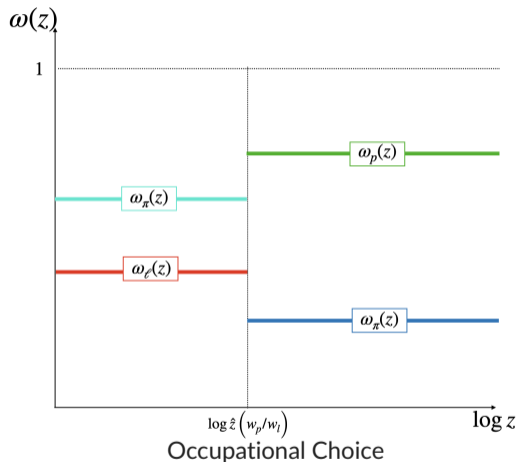
What Happens When Skill Supply Expands?



What Happens When Skill Supply Expands?

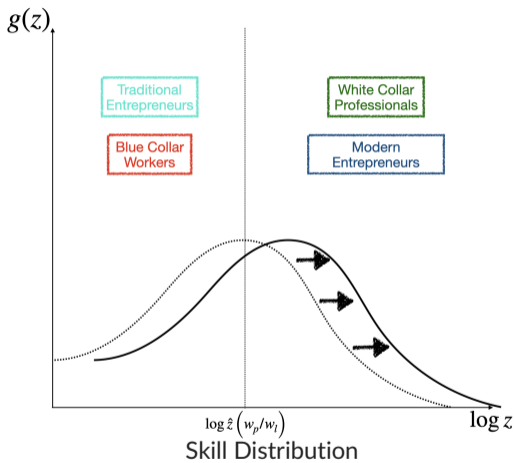
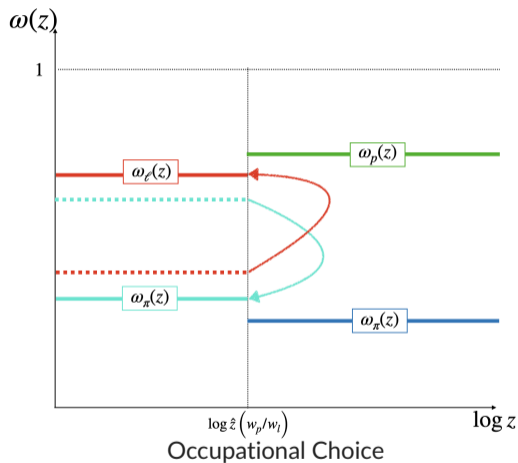


What Happens When Skill Supply Expands?



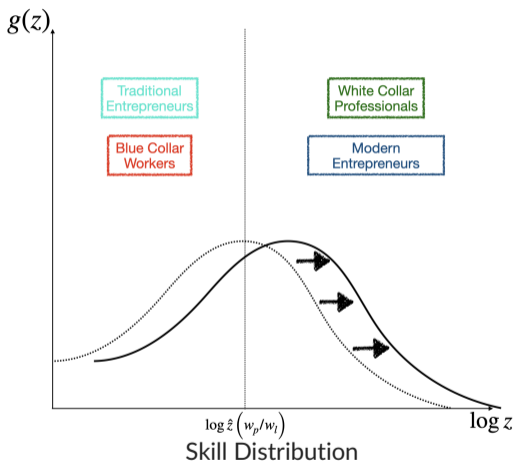
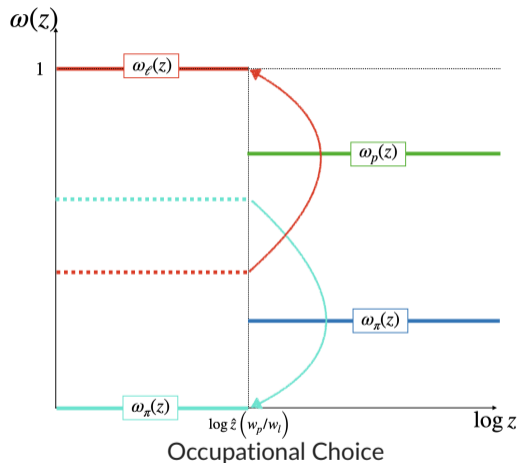
No effect on skill premium \Rightarrow constant \hat{z} , \uparrow white collar due to composition effects only

What Happens When Skill Supply Expands?



↑ Demand from modern firms \Rightarrow traditional entrepreneurs become laborers

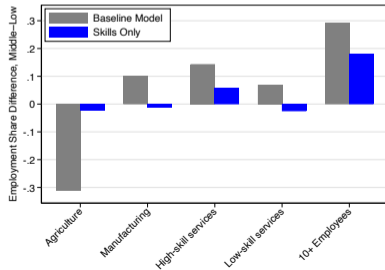
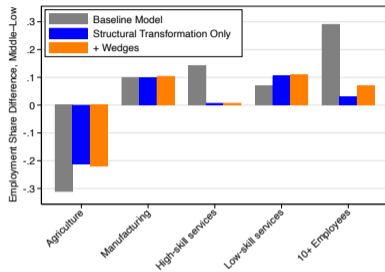
What Happens When Skill Supply Expands?



Large skill increase \Rightarrow all low-skilled are pulled in modern firms \Rightarrow duality disappears

Quantification: What Accounts for Organizational Differences?

- ▶ Compare low- to middle-income countries
- ▶ Three differences across countries:
 - ▶ **skills**
 - ▶ sectoral shifters
 - ▶ wedges
- ▶ Structural transformation + wedges:
explain shift from agr to mfg, but little reorganization
- ▶ Skills alone: 60%+ of reorganization
but generate limited sectoral transformation



Conclusion

- ▶ Production is organized differently in low-income countries
- ▶ Typical view: these differences reflect frictions
- ▶ Alternative view: firms adapt to the available skills, demand, and technology
 - ▶ Low-income countries today should not necessarily follow in our footsteps (Porzio, 2017)
- ▶ Understanding **how firms and economies produce and why** can be key for development
 - ⇒ Changes how we should think about the role of different growth policies
- ▶ **Lots of exciting open questions!**

References

- Bassi, V., Lee, J. H., Peter, A., Porzio, T., Sen, R., and Tugume, E. (2025). Self-Employment Within the Firm. NBER Working Paper 31740.
- Bento, P. and Restuccia, D. (2021). On average establishment size across sectors and countries. *Journal of Monetary Economics*, 117:220–242.
- Engbom, N., Malmberg, H., Porzio, T., Rossi, F., and Schoellman, T. (2025). Economic Development According to Chandler. Technical report, National Bureau of Economic Research.
- Porzio, T. (2017). Cross-Country Differences in the Optimal Allocation of Talent and Technology. mimeo, Columbia University.