

Structural Transformation II

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Lecture Outline

Here we will discuss some key issues in structural transformation:

- 1 Fitting the data
 - ▶ persistent nonhomotheticities
 - ▶ open economy
- 2 Agriculture productivity gaps
- 3 Industrialization and de-industrialization
 - ▶ inequality
 - ▶ productivity/convergence
 - ▶ normative evaluation
- 4 Service economies
 - ▶ heterogeneity
 - ▶ skill-intensity

Further forces

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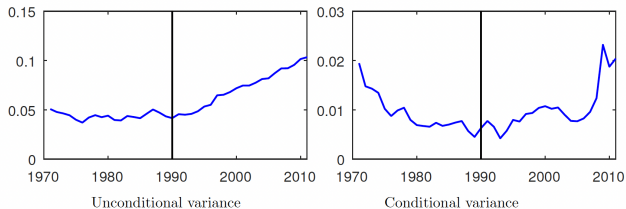
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 - 4 ST patterns can reflect not only domestic productivity but international competition/global prices
- Overall, ST is driven by closed economy forces (world is a closed economy)

How important is trade quantitatively?

- Trade increases dispersion of sectoral VA/labor shares (Sposi, Yi, Zhang, 2022)
- Important for some countries
 - ▶ e.g., South Korea (Uy, Yi, and Zhang, 2013)
 - ▶ ... but analysis ignores role of investment
- Trade on its own small, but interacts with wedges (Swiecki, 2017)

Increased Dispersion From Trade (Sposi et al, 2022)

Figure 4: Industry Polarization
Cross-country Variance of Manufacturing Value Added Shares



Korean Driving Forces (Uy, Yi, and Zhang, 2013)

Figure 2: Calibrated TFP Series

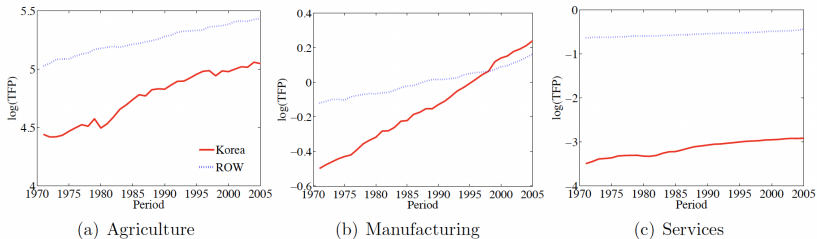
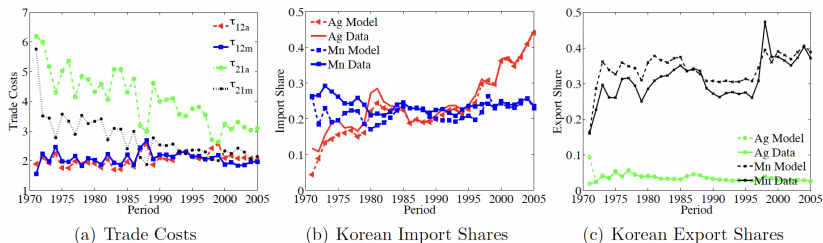


Figure 3: Calibrated Trade Costs and Korean Trade Shares



Korean Impact of Openness on ST (Uy, Yi, and Zhang, 2013)

Figure 5: Korean Output Shares: Benchmark

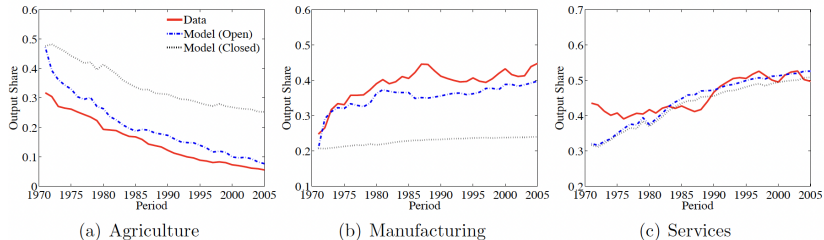
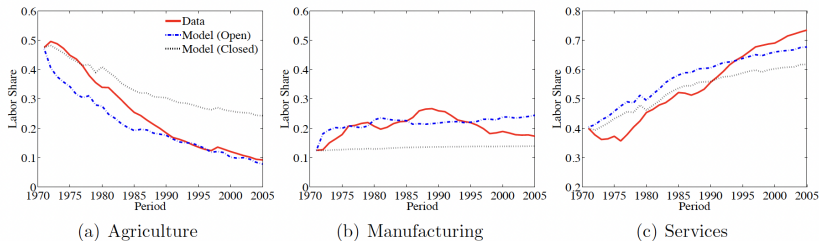


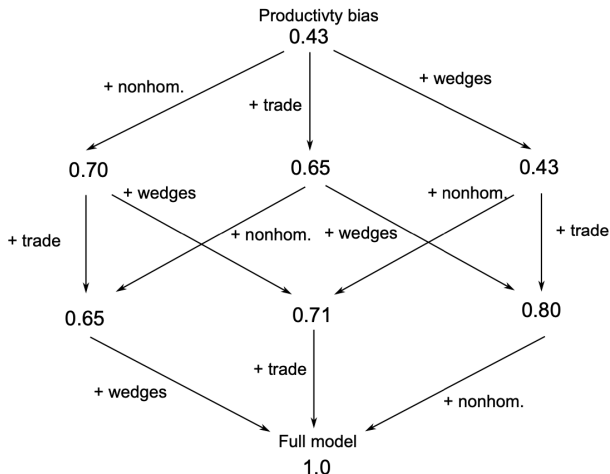
Figure 4: Korean Structural Change: Benchmark



Average Impacts in the World (Swiecki, 2017)

Closed economy forces powerful, but trade and wedges interact

Figure 5: Marginal Effects of Adding New Channels



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- Distortions lead to additional growth gain for moving workers out of agriculture...
- ...justified concern for infrastructure, urban migration, rural education, etc.

The Agricultural Productivity Gap II

Using detailed microdata measurement, Gollin, Lagakos, and Waugh (2014) show:

- 1 Accounting for hours reduces gap by factor of 1.1
- 2 Accounting for schooling reduces gap by factor of 1.4
- 3 Adjusted APGs:
 - ▶ average: 2.2
 - ▶ poorest quartile of countries: 3
- 4 Differences in labor's share can't explain remaining gaps
- 5 Micro data measures are important here!

Industrialization and Deindustrialization

- Historically, industrialization plays key role in development.
- Not clear how necessary that is, especially today
 - ▶ Some level of industrialization (construction, electricity, etc.) seems necessary for a flourishing economy
 - ▶ Service-led counterexamples, e.g., 4.5% real GDP/capita growth for 40 years, but never more than 13% employed in manufacturing proper
- Rodrik has emphasized manufacturing in two influential papers
 - ① Rodrik (2013) - "only convergence in manufacturing"
 - ② Rodrik (2015) - "premature deindustrialization"

Unconditional Manufacturing Convergence, Rodrik, 2013

- Unconditional convergence asks whether poor countries grow faster than rich countries
- Rodrik (2013) claimed they don't, but using longer time series evidence, Buera et al (2022) (earlier today!) showed evidence that they do!
- Issue: Rodrik (2013) claimed that only manufacturing showed unconditional convergence...
- ... but Rodrik (2015) showed that countries are industrializing less over time.

Rodrik's Overall Economy Results

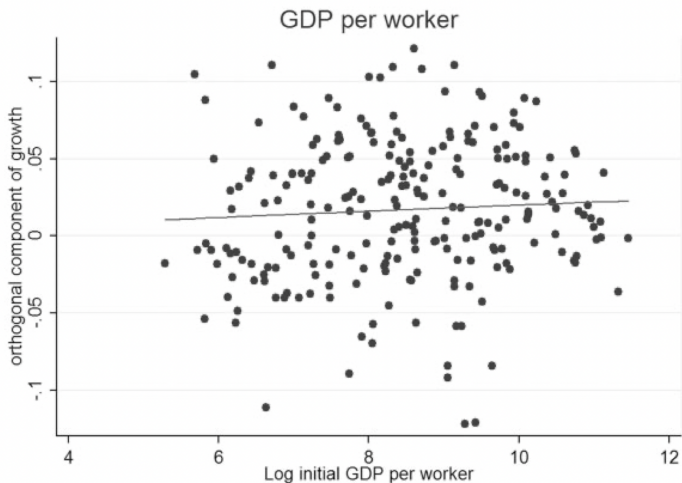


FIGURE I

Lack of Convergence in Economy-wide Labor Productivity

Rodrik's Manufacturing Results

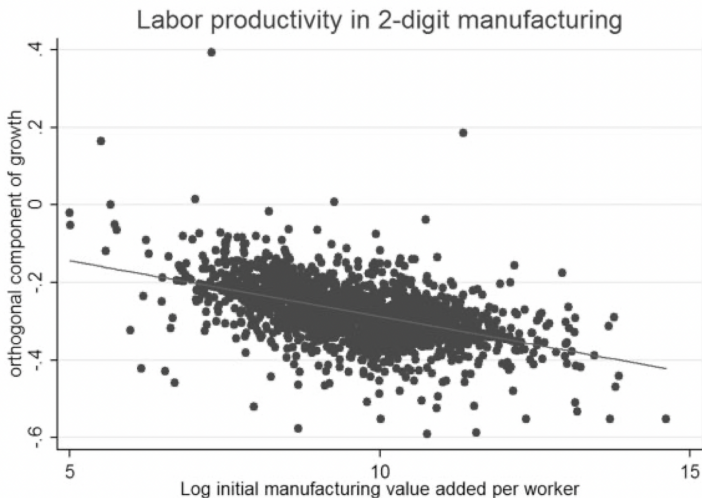


FIGURE II

Unconditional Unconditionce in 2-digit Manufacturing Sectors

Re-examining Rodrik (2013)'s Results

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- Sectors do matter though!
 - ▶ Manufacturing productivity growth highly correlated with overall productivity growth
 - ▶ So are transp., trade, bus. services, finance, and government

Productivity Gaps Larger than Average in Manufacturing

Figure 1: Productivity Gaps in Agriculture vs. Aggregate (EETD)

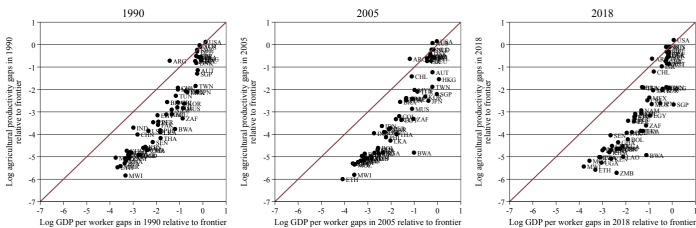
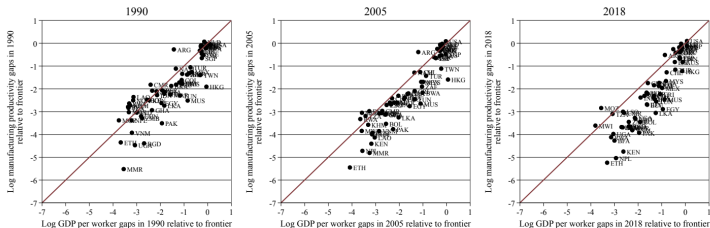
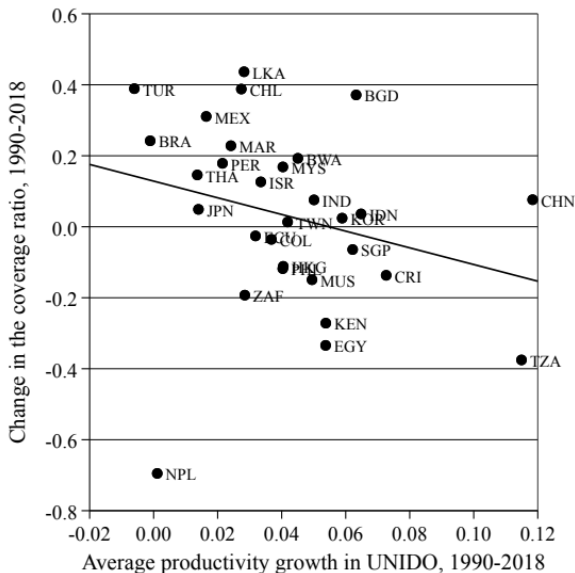


Figure 2: Productivity Gaps in Manufacturing vs. Aggregate (EETD)



Mismeasured “Convergence” is Driven by Data Coverage



Rodrik's "Premature" De-Industrialization

Later industrializers peak earlier, at lower levels of industrialization

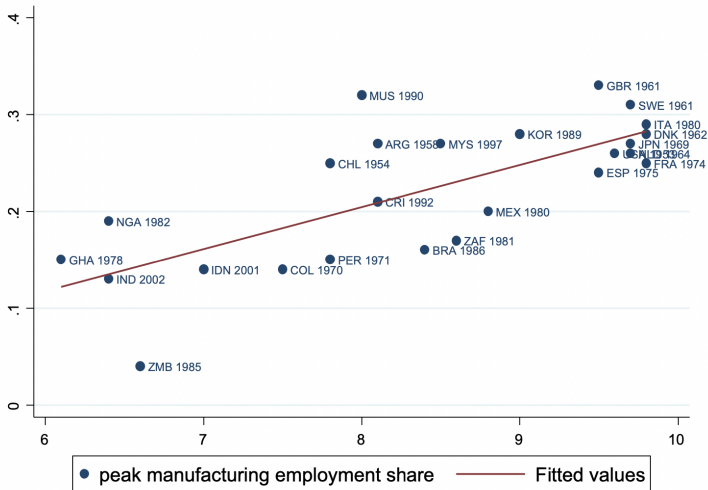


Fig. 5 Income at which manufacturing employment peaks (logs)

But question

remains as to what is "premature"

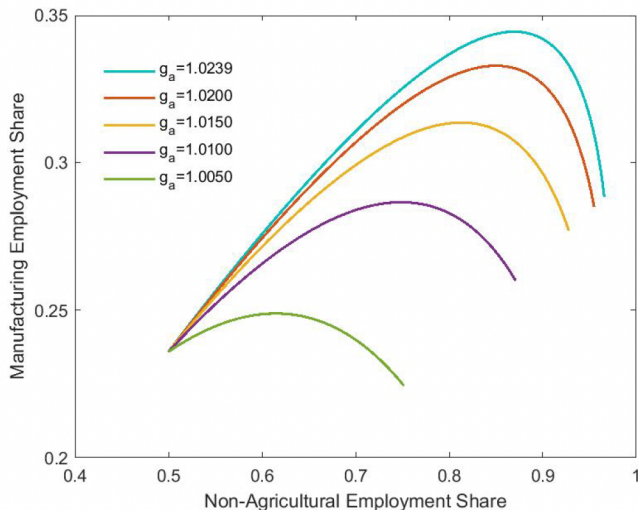
What Might Explain “Premature” De-Industrialization?

Chief candidates:

- 1 Falling relative price of manufactured goods
 - ▶ Not all countries are equal (China is a very large data point)
 - ▶ Technology makes manufacturing more productive now than 50 years ago
- 2 Slower productivity growth in agriculture (less flow into manufacturing at low incomes) (Huneus and Rogerson, 2022)

But both explanations in standard models say that this is efficient!

Slow Productivity Growth and Premature De-Industrialization



Could manufacturing/industry still matter?

(At least) four ideas:

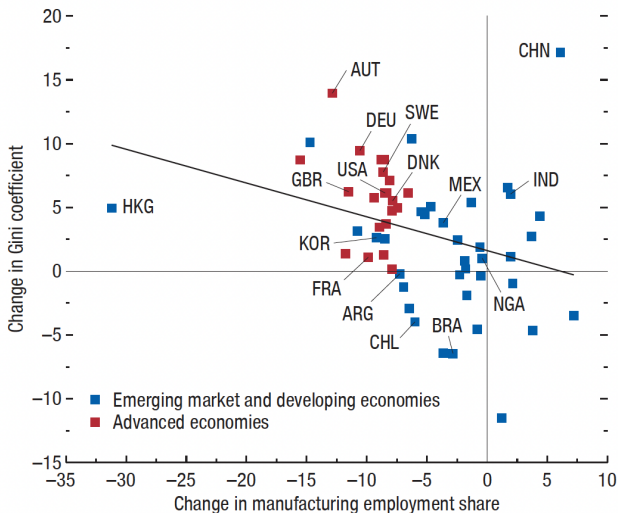
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- 1 Herrendorf et al (2022) show manufacturing productivity growth correlated with overall productivity growth
- 2 Producing investment is intensive in industry (Herrendorf et al, 2021, Garcia-Santana et al, 2021)...
- 3 ... or need to produce something tradable to import investment (agr vs. manuf. vs. tradable high-skill services)
- 4 Distributional issues: more intensive in low-skill labor? (e.g., Buera & Kaboski, 2011, Buera et al, 2021), better paying?

Manufacturing Employment and Inequality



Service economies

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- Measurement difficult in services
- Great degree of heterogeneity in services:
 - ▶ government vs. market provision
 - ▶ scale of productive units
 - ▶ tradability
 - ▶ skill-intensity
 - ▶ productivity growth

Progressive vs. Stagnant Services (Duernecker et al, 2022)

- overall service productivity grows slower than goods productivity, but...
- progressive services grow faster than goods sector
- highly substitutable within services
- so fast growing services grow and attract resources

Progressive Services (Duernecker et al, 2022)

- They define progressive industries as those with faster productivity growth than the sector.
- What are these progressive services (in the US)?
 - ▶ Transportation (air, rail, pipeline, trucks)
 - ▶ Trade (wholesale, retail, storage)
 - ▶ media (publishing, movies, broadcasting, performing arts/sports, etc.)
 - ▶ some FIRE (securities exchanges and insurance, but not banks, rental but not real estate)
 - ▶ some business services (administration and management but *not* computer services)

High-skill vs. low skill services

Patterns across skill-intensity as well (e.g, Buera and Kaboski, 2011, Buera, Kaboski, Zhao, 2019):

- High-skill intensive services accounts for (more than) all of services growth
- These sectors grow/accelerate when college education increases
- especially associated with increase in female labor supply

High-Skill Service Growth in Post-War US

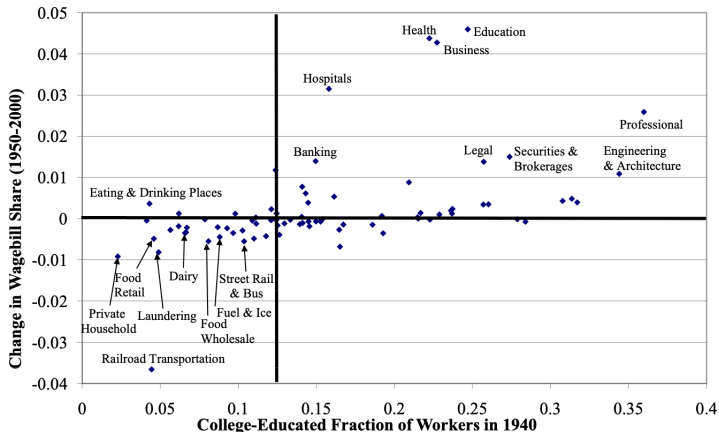


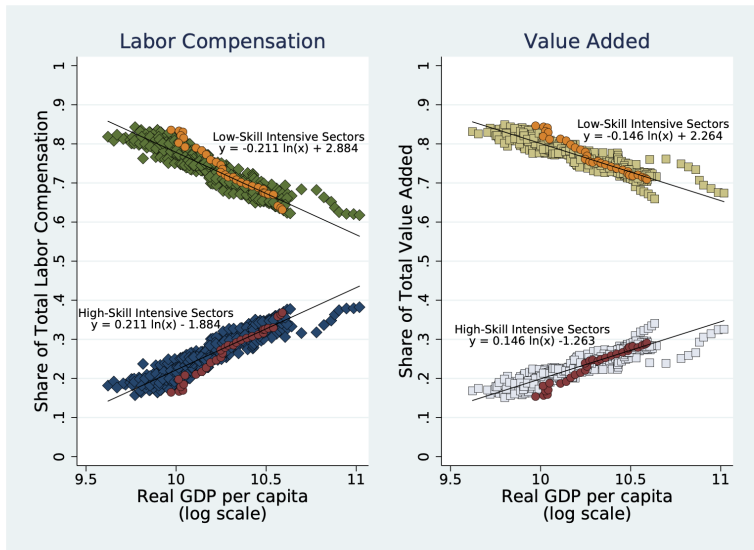
Figure 4: Growth vs. Skill Intensity of Disaggregate Service Industries

Skill-Biased Structural Change (SBSC)

- Buera, Kaboski, and Rogerson (2022) define SBSC as increase in share of skill-intensive sector with development.
- “Skill-intensive sector” is the most skilled industries (finance, education, health, and business services)
- Highly salient in the data
- Driven by standard ST forces:
 - 1 Increasing relative price of skill-intensive sector with development
 - 2 Skill-intensive sector is luxury
- Skill-intensive goods industries (electronics, chemicals) also grow with development, but not their relative prices

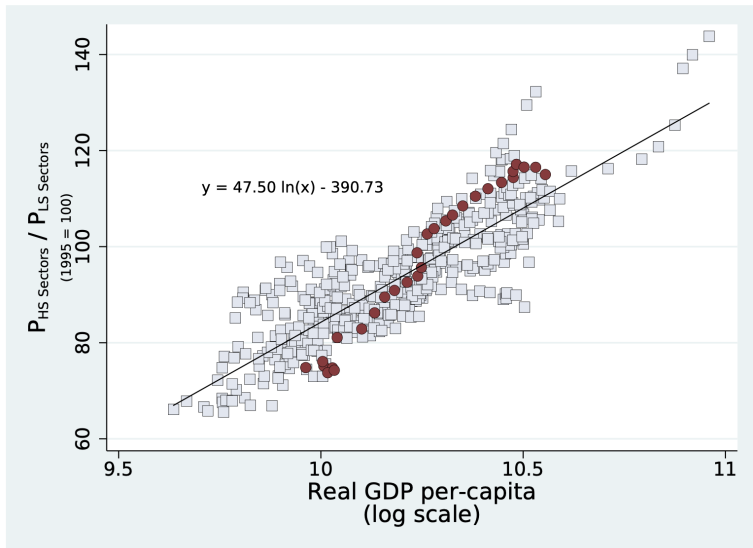
SBSC Over Development in Advanced Economies

Figure 1: Structural Change by Skill Intensity and Economic Development.



Rising Rel. Price of Skill-Int. Sector in AE

Figure 2: Relative Price of Skill-intensive Sector and Economic Development.



Skill-Intensive Sector is Luxury

Table 1

Household Skill-Intensive Expenditure Share vs. Income or Total Expenditures

	OLS	OLS	IV	IV	OLS
Ln Income	0.030*** (0.001)	-	0.054*** (0.002)	-	-
Ln Expenditures	-	0.050*** (0.002)	-	0.081*** (0.002)	-
High-skill Head	-	-	-	-	0.047*** (0.002)
R^2	0.19	0.22	0.12	0.16	0.18
Observations	13, 144	13, 210	13, 144	13, 210	4, 056

Importance of SBSC

- Contributes to rising skill-premium: 20-25% in median advanced country (SBTC is remainder)
- Highly predictable despite very different institutions
- ... \implies this is something that countries like Malaysia can expect
- additional justification for emphasis on human capital investments
 - ① rising skill premium contributes to rising inequality
 - ② ... but increased supply counteracts
 - ③ also education suffers from natural market failure in financing
 - ④ rising skill premium reflects bigger growth gains to educational investment

Key Issues for Malaysia

I conclude with some key issues for Malaysia:

- What explains post-mature de-industrialization in Malaysia?
 - ▶ oil endowments/exports?
 - ▶ rapid agricultural productivity growth?
 - ▶ openness?
 - ▶ data artifact of financial crisis?
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- Anticipate de-industrialization and high skill service growth!
- This process may be unequalizing
- How can it be inclusive and high growth?
 - ▶ support progressive export sectors
 - ▶ efficient government sector in skill-intensive industries like health, education, finance
 - ▶ invest heavily in higher education