Why Has Indonesia Been Struggling to Upgrade within GVCs?

Some Thoughts from a Comparative Study

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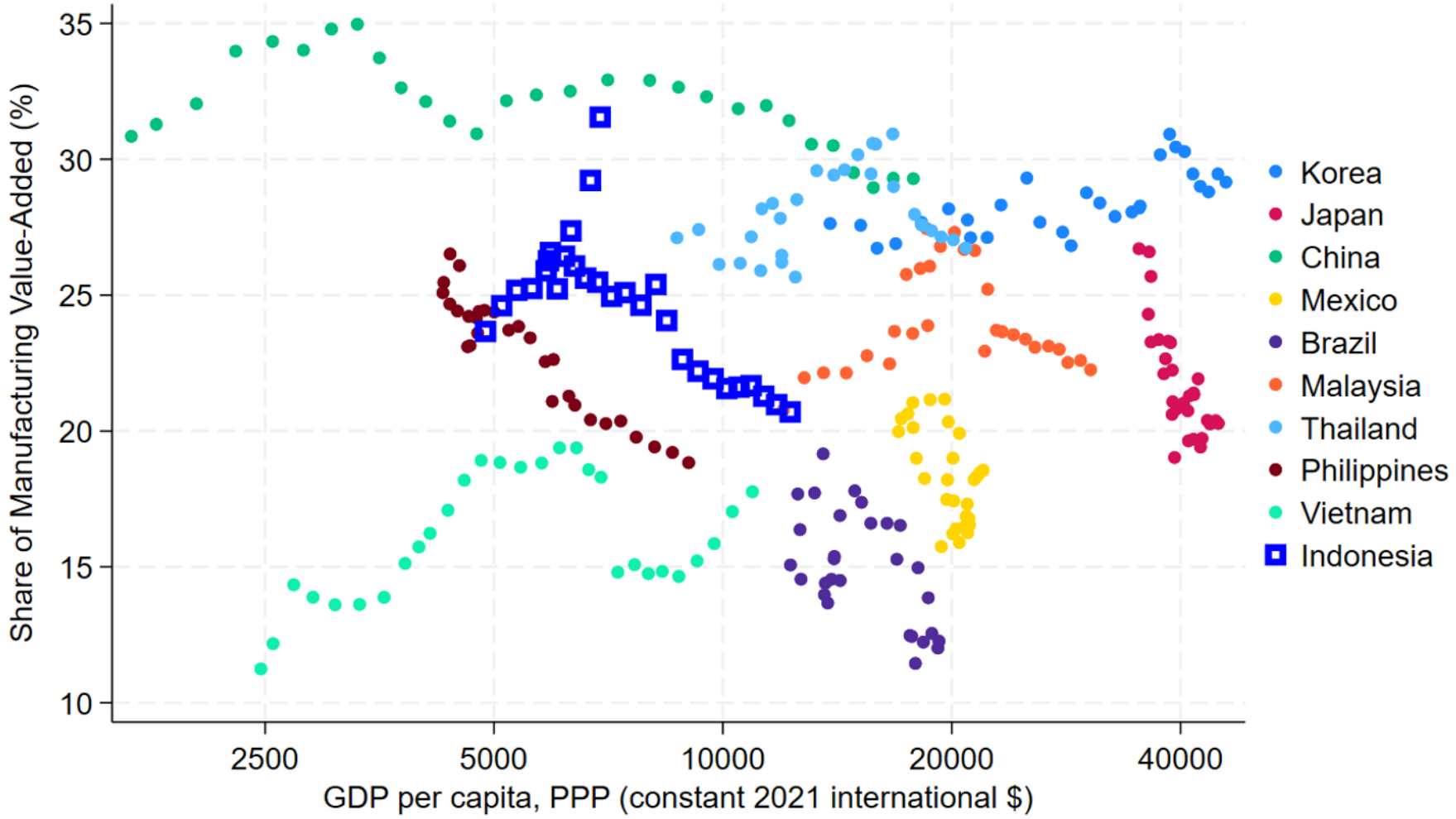
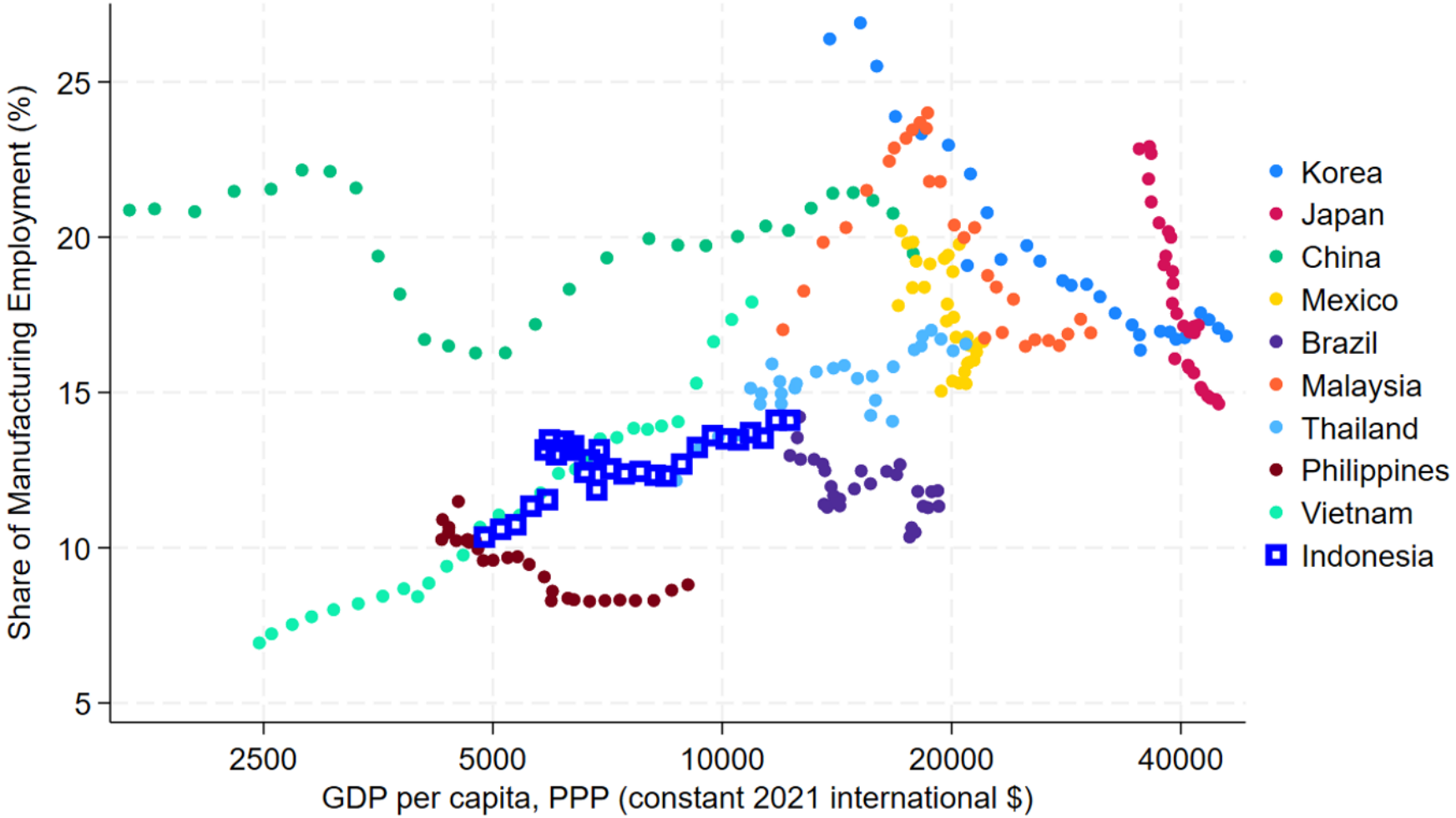
Motivation

- The manufacturing value-added share in Indonesia reached near 33% in the late 1990s.
- It has been declining since then with two sharp drops during AFC and GFC.



Motivation

- The employment share has been increasing up to 14%.
- Hence, the relative labor productivity of manufacturing must have declined.

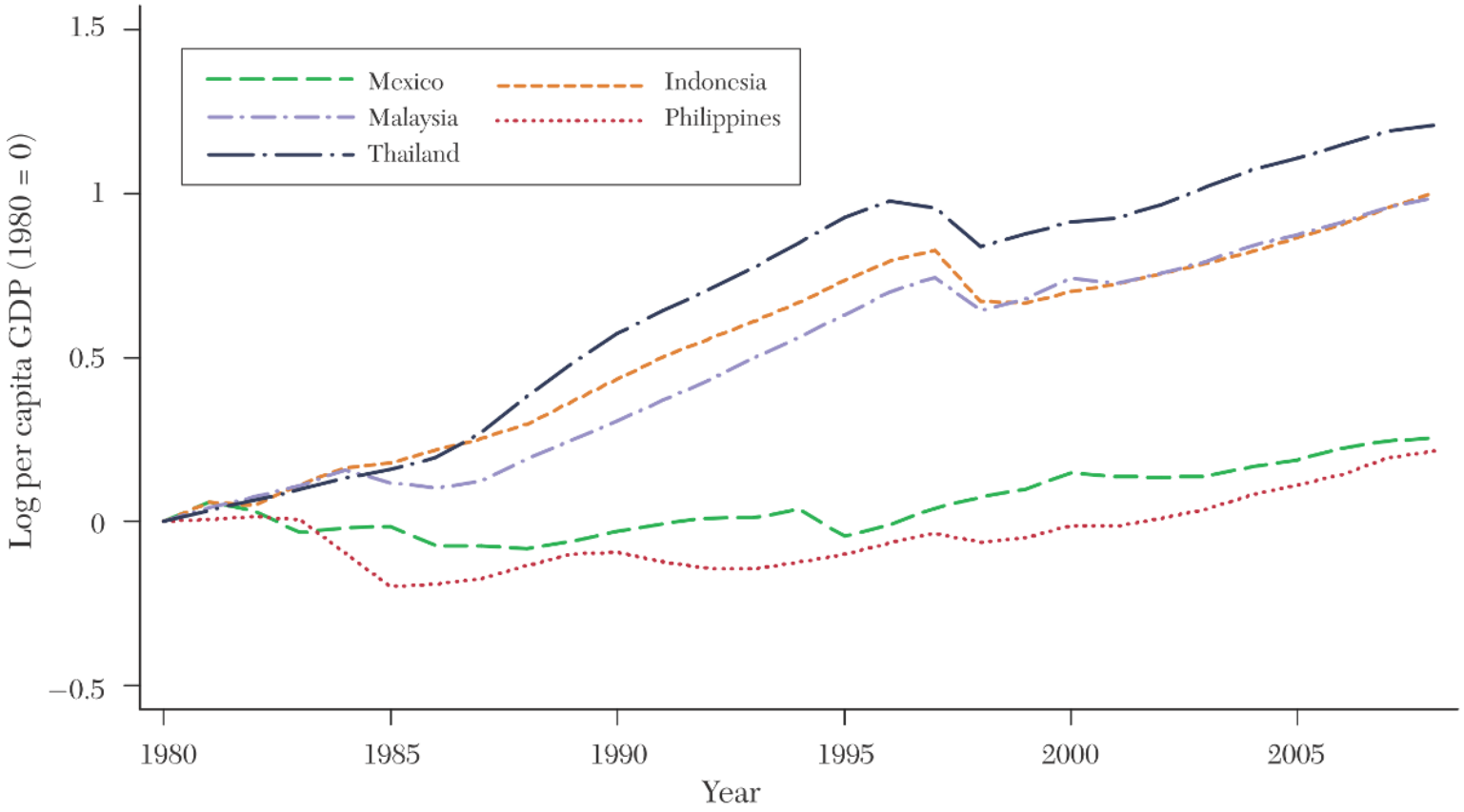


Question

- Despite strong participation in GVCs, the transition toward higher-technology, skill-intensive production has been limited.
  - Before the AFC, Indonesia was among the most active low-skilled manufacturers.
    - ★ Hosted global firms in sectors like footwear, clothings, electronics, auto parts...
  - The subsequent trajectory shows signs of premature de-industrialization (Rodrik 2016).
- **(Question)** Why Has Indonesia Been Struggling to Upgrade within GVCs?
  - à la Hanson (2010 JEL): "Why isn't Mexico Rich?"
- **(Ideation)** Analyze a similar experience in Mexico and try to draw some lessons.
  - Mexico: Maquiladora model $\rightarrow$ rapid export growth (but low value-added)
  - Indonesia: Aimed for similar GVC-led growth (electronics, textiles, footwear, auto parts)

Why Isn't Mexico Rich? What Can We Learn?

- Despite several reforms, per capita GDP growth lagged behind East Asia.
  - Macro stabilization, privatization, trade & investment liberalization (e.g., NAFTA)



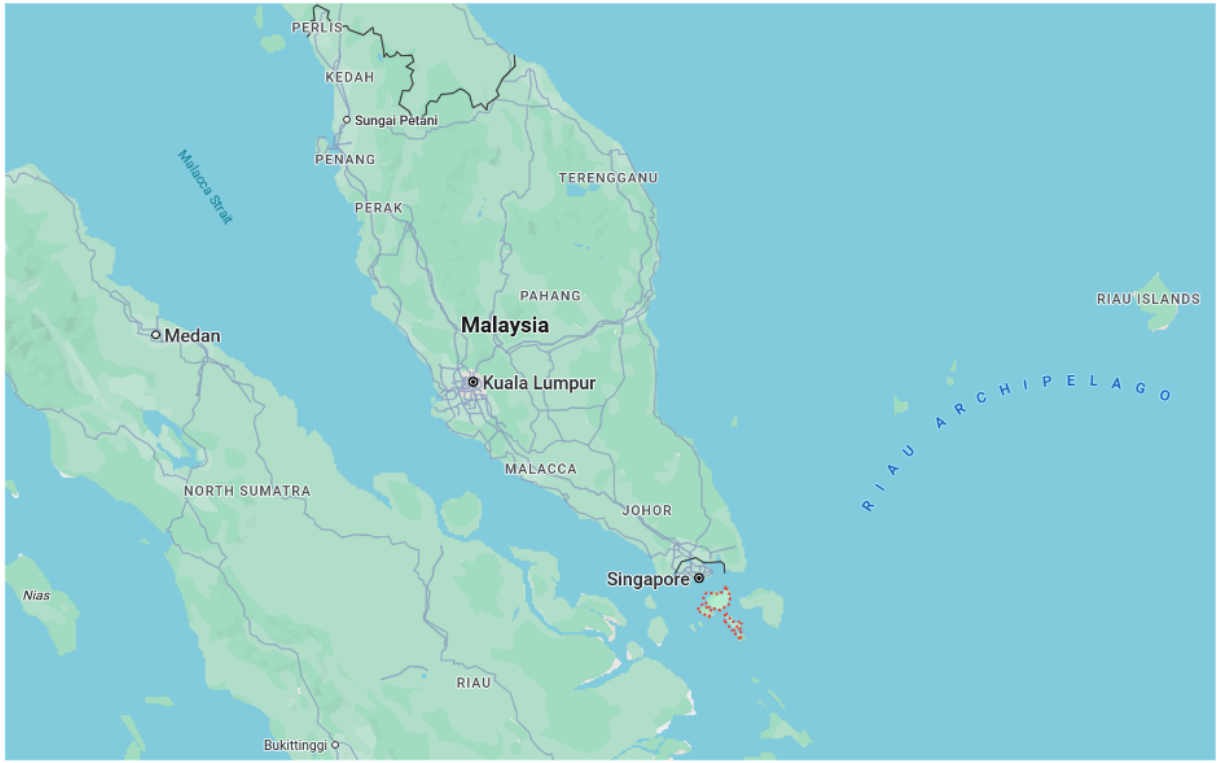
Source: Hanson (2010).

Maquiladora in Mexico

- Maquiladora is a core growth strategy through GVC participation.
  - Started from Ciudad Juárez, just across the border btw. the US and Mexico
  - Similar to Batam FTZ near Singapore and Malaysia

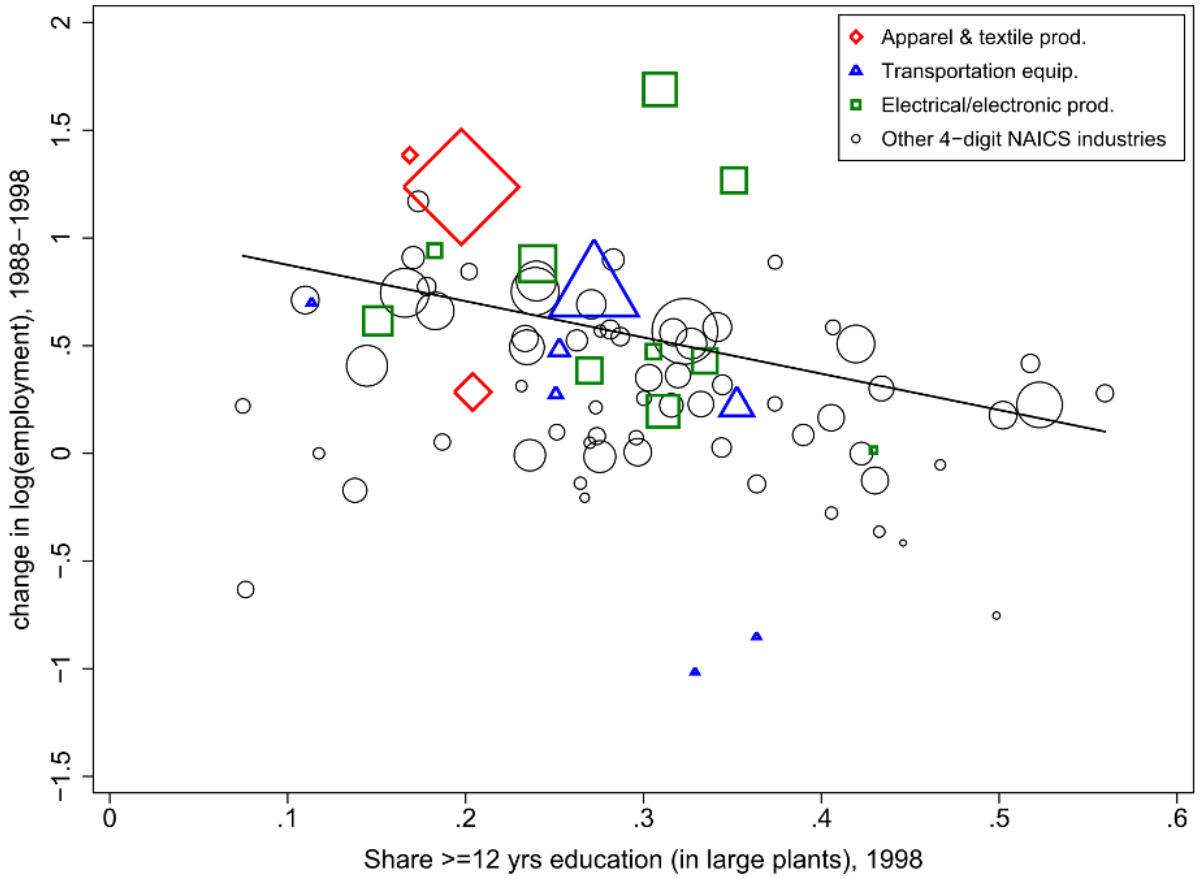
(a) Ciudad Juárez

(b) Batam FTZ

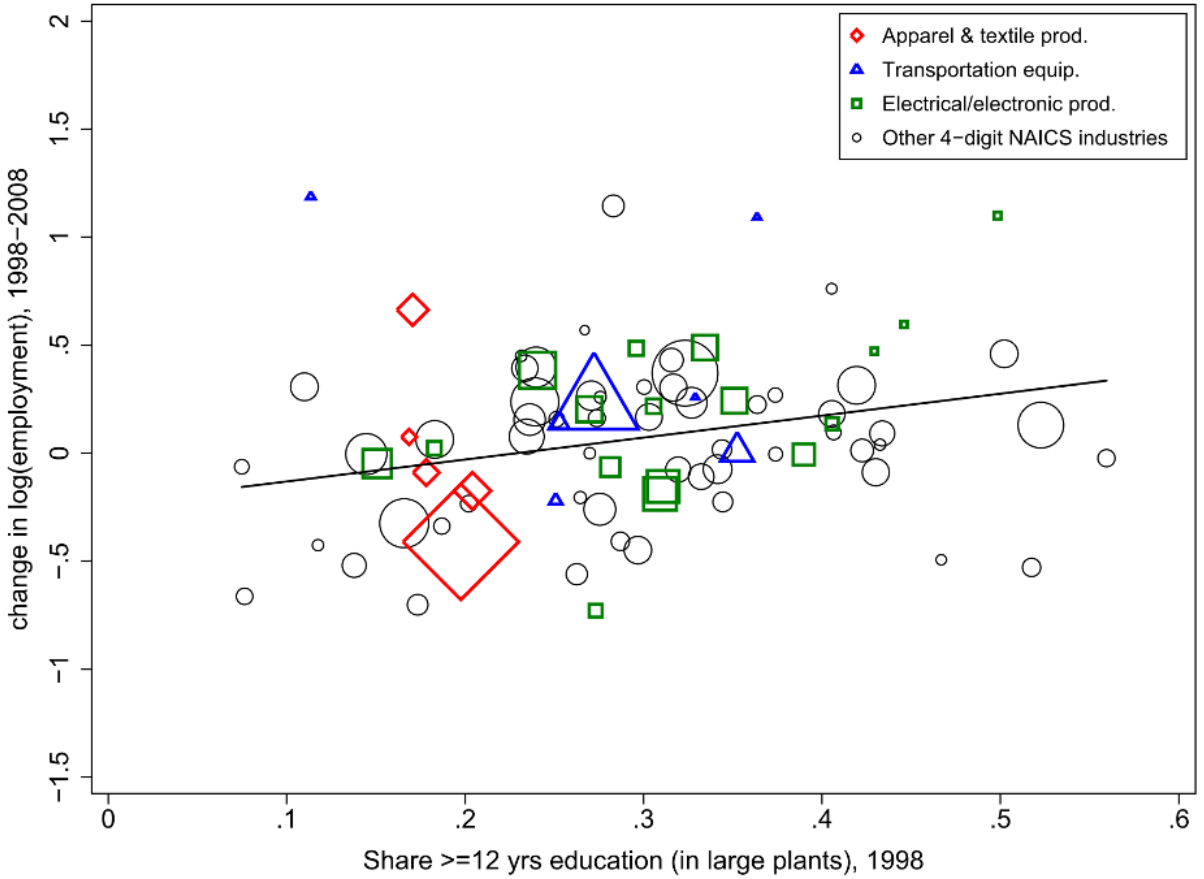


Employment Growth vs. Skill Intensity in Mexico

(a) 1988∼1998

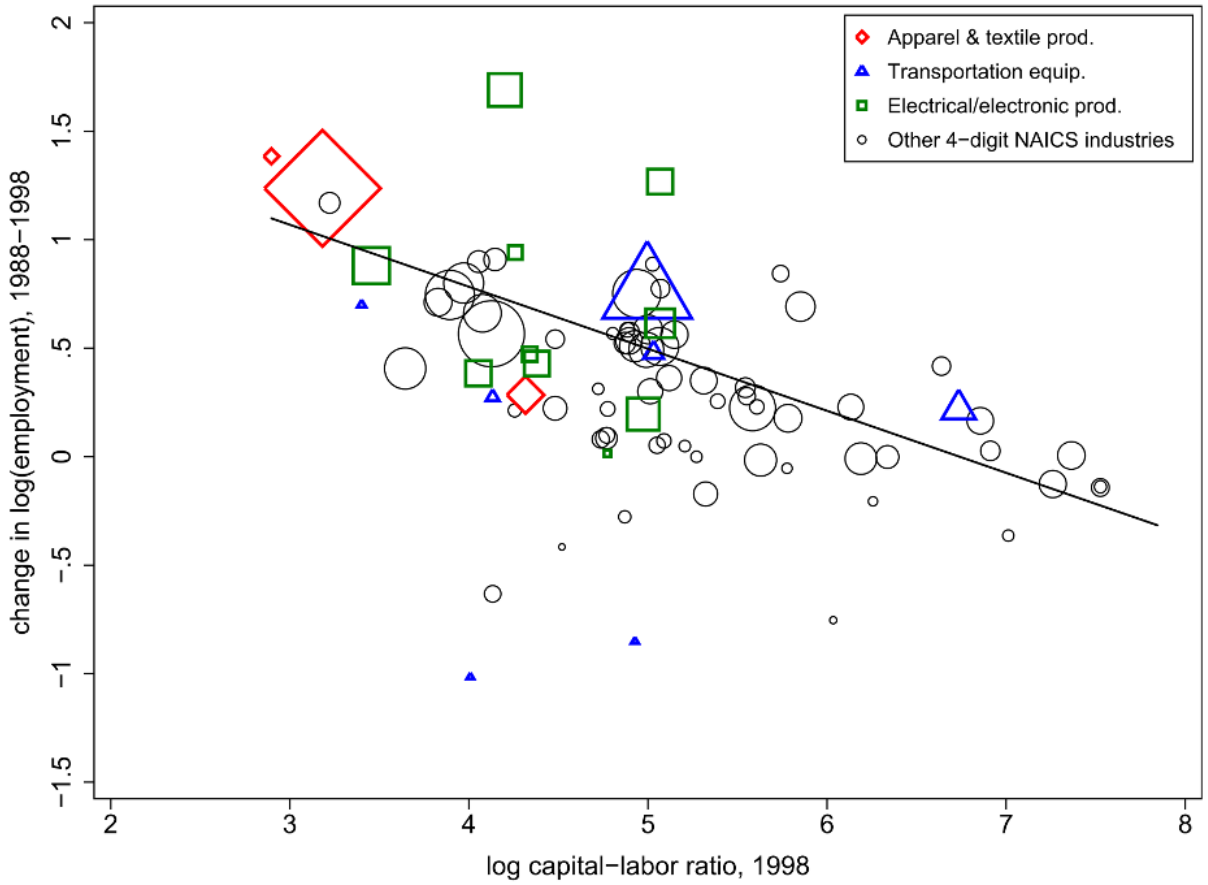


(b) 1998∼2008

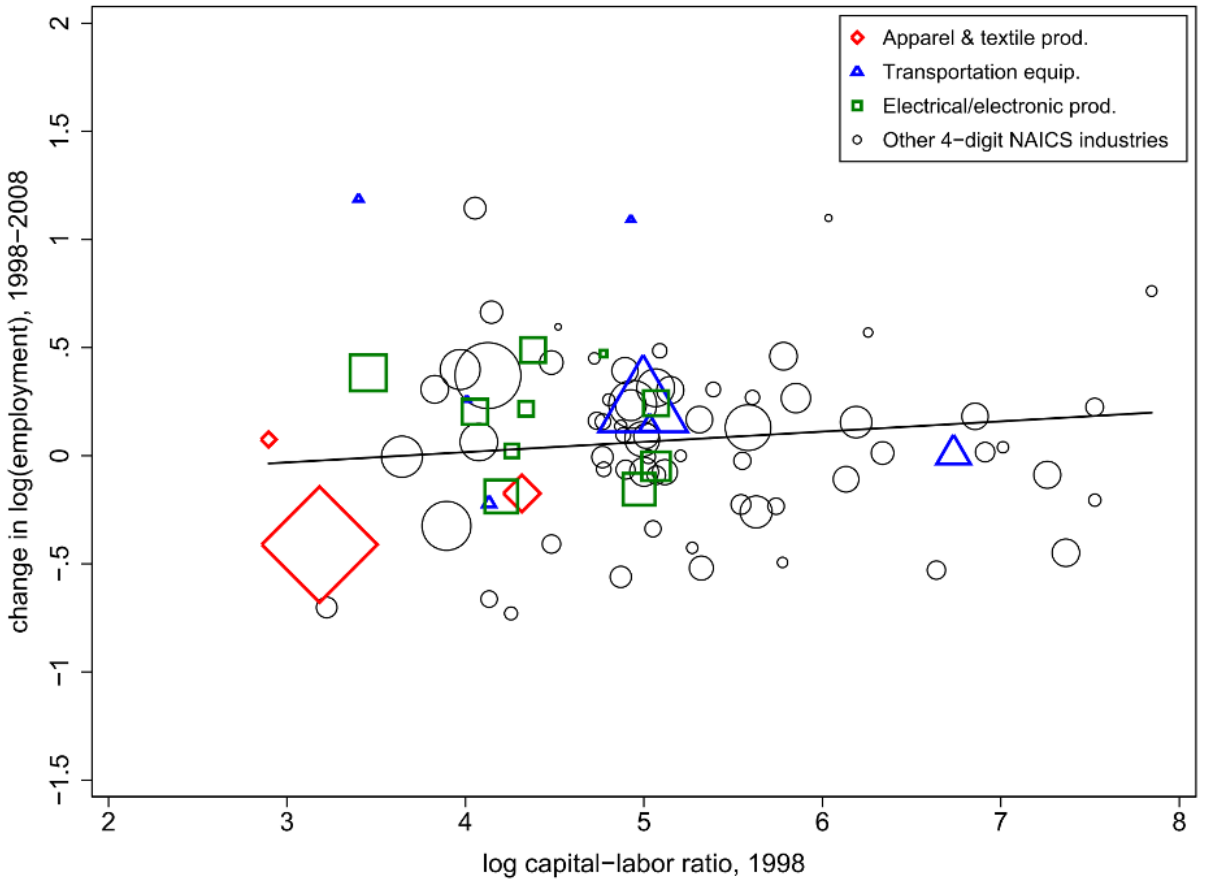


Employment Growth vs. Capital Intensity in Mexico

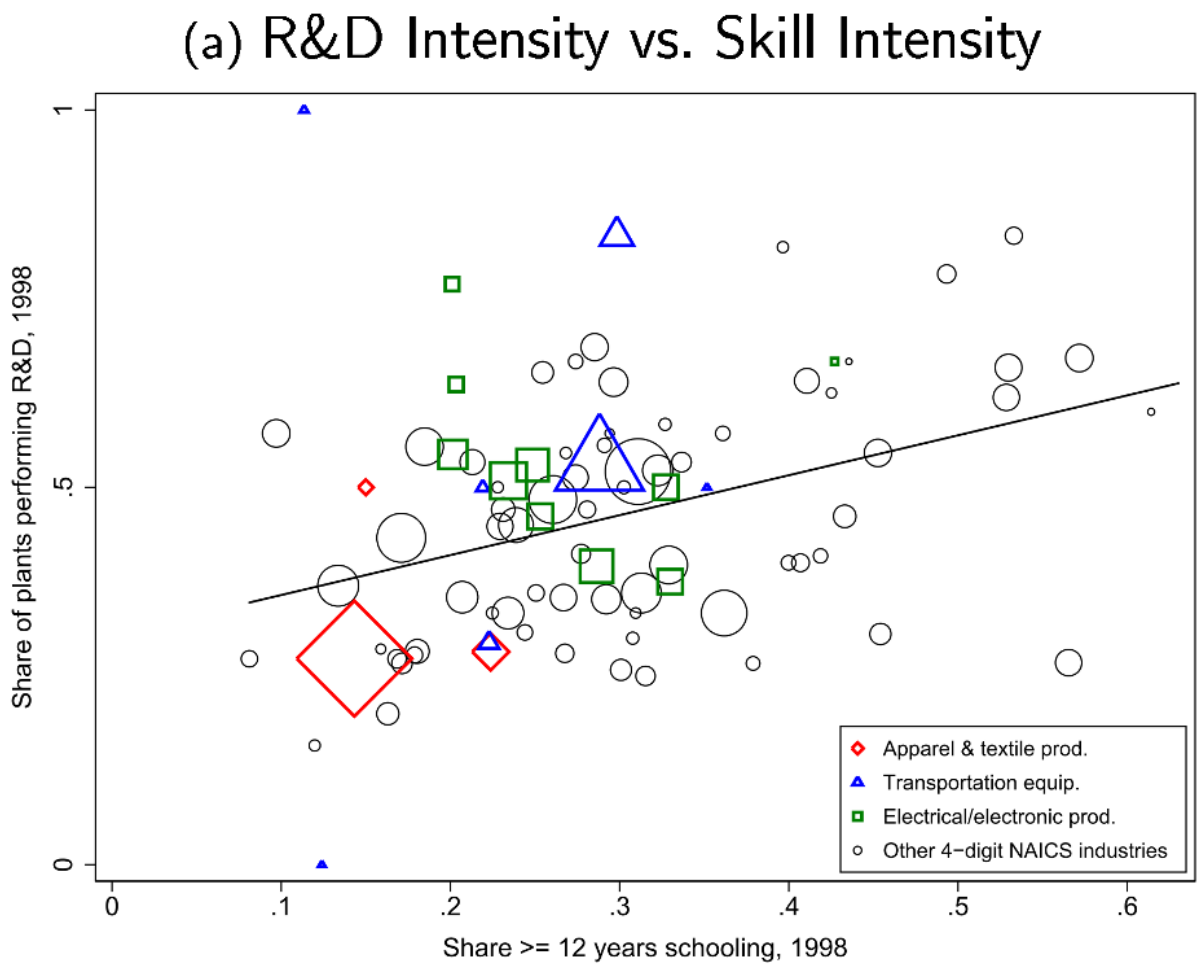
(a) 1988∼1998

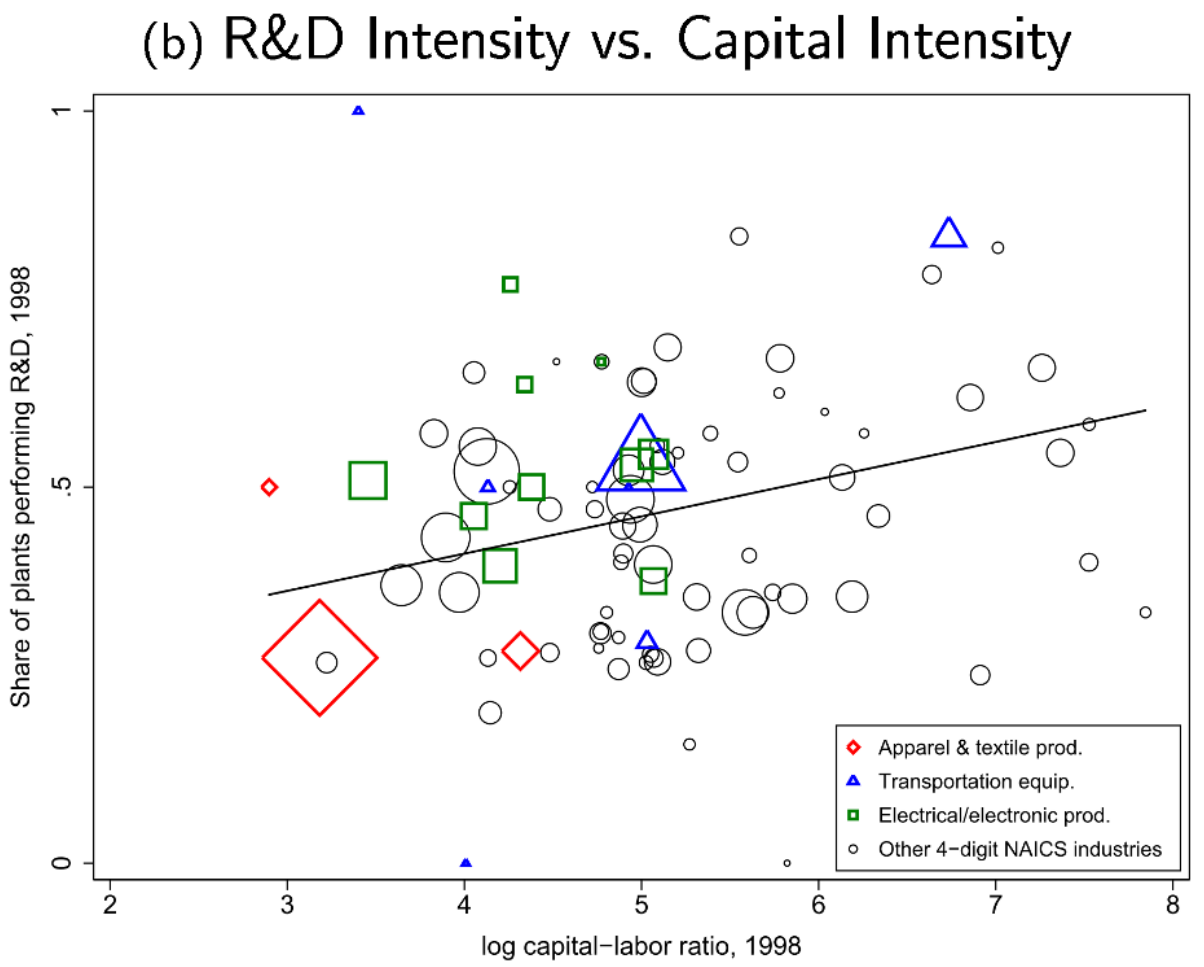


(b) 1998∼2008



R&D Intensity vs. Skill & Capital Intensity in Mexico





Plant Structure in Apparel, Textile, Elect. Prod., & Trans. Equip.

	non-maquiladoras		
	non-exporters	exporters	maquiladoras
	(1)	(2)	(3)
Employment	315.43	438.97	969.67
	(8.23)	(11.07)	(30.02)
Export percentage of sales		30.81	96.52
		(0.72)	(0.63)
Foreign ownership indicator	0.08	0.29	0.84
	(0.01)	(0.01)	(0.02)
Capital-labor ratio	254.26	309.07	54.87
	(19.11)	(14.45)	(7.18)
Share with $>=$ 12 years schooling	0.28	0.32	0.19
	(0.01)	(0.01)	(0.01)
Percentage blue-collar	70.18	70.75	83.04
	(0.56)	(0.46)	(0.63)
Years of schooling, blue-collar	7.86	8.15	7.37
	(0.04)	(0.04)	(0.06)
Blue-collar hourly wage	3.59	3.92	3.83
	(0.06)	(0.05)	(0.10)
White-collar hourly wage	7.45	9.32	9.33
	(0.14)	(0.15)	(0.27)

Skill Acquisition in Mexico (Atkin, 2016 AER)

- Maquiladoras induced early school drop-out.
  - For every 25 jobs created, one student dropped out of school at grade 9.

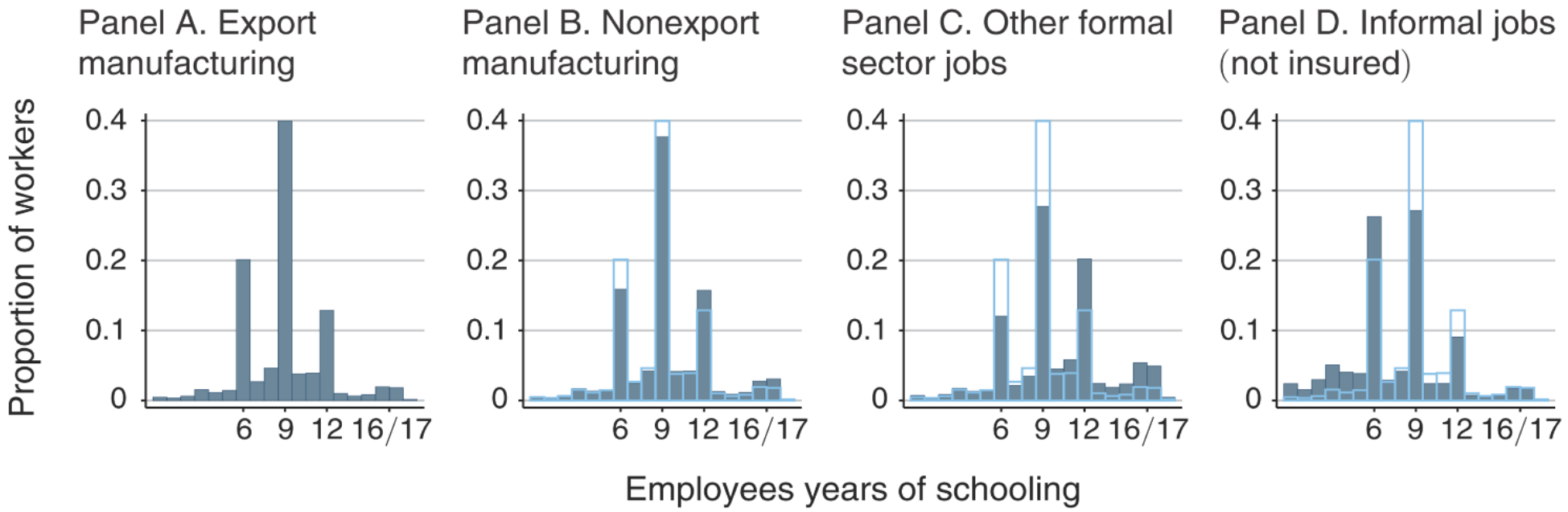
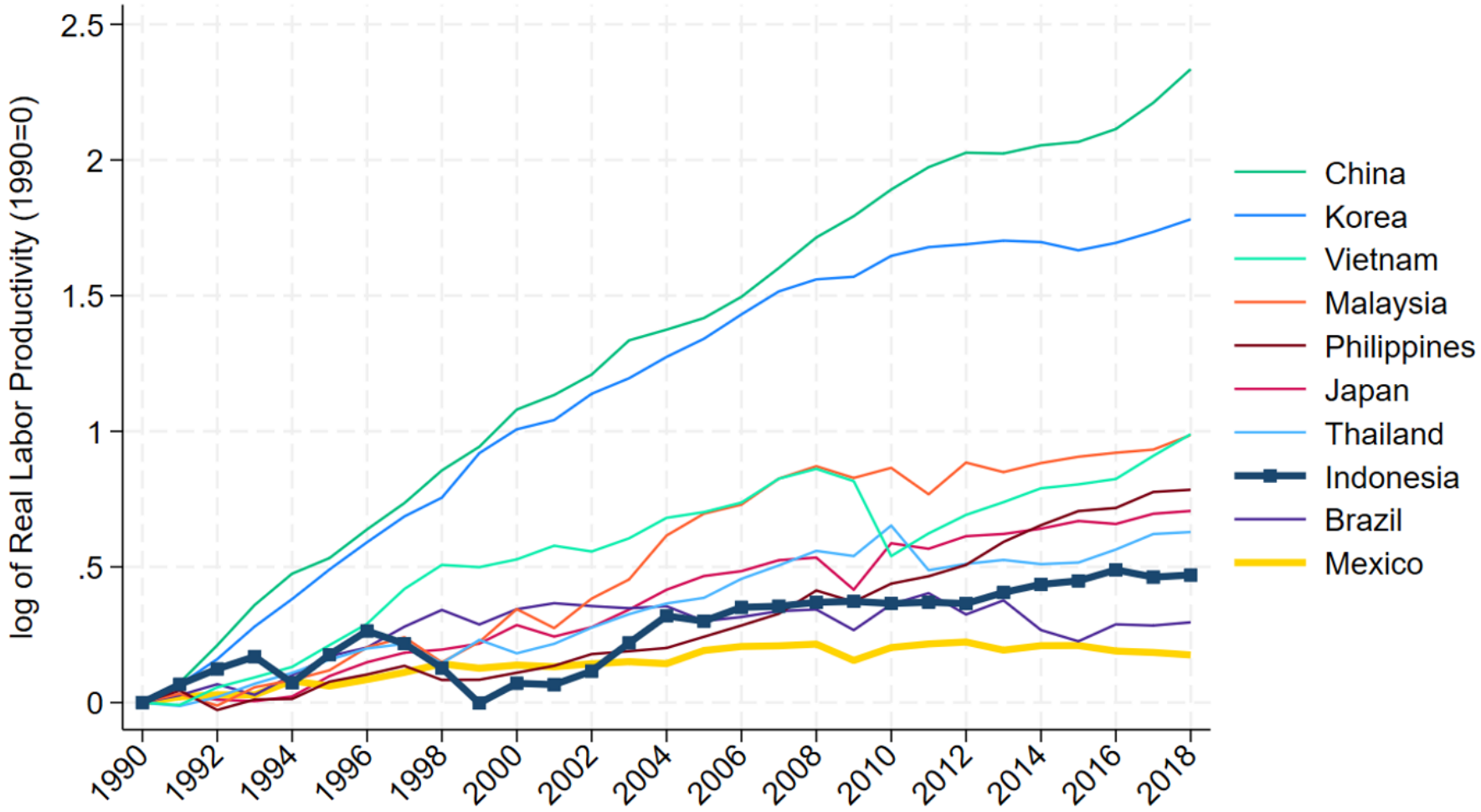


FIGURE 2. HISTOGRAM OF EDUCATION BY SECTOR (*Age 16–28 in 2000, IMSS Insured*)

Notes: Solid bars show the education distribution calculated using the 2000 census for formal sector workers ages 16 to 28 (my sample cohort). A formal worker is defined as a worker insured by IMSS or equivalent insurance scheme. Panels B–D overlay the export manufacturing education distribution from panel A as hollow bars for comparison purposes.

(log of) Labor Productivity in Manufacturing (1990=0)

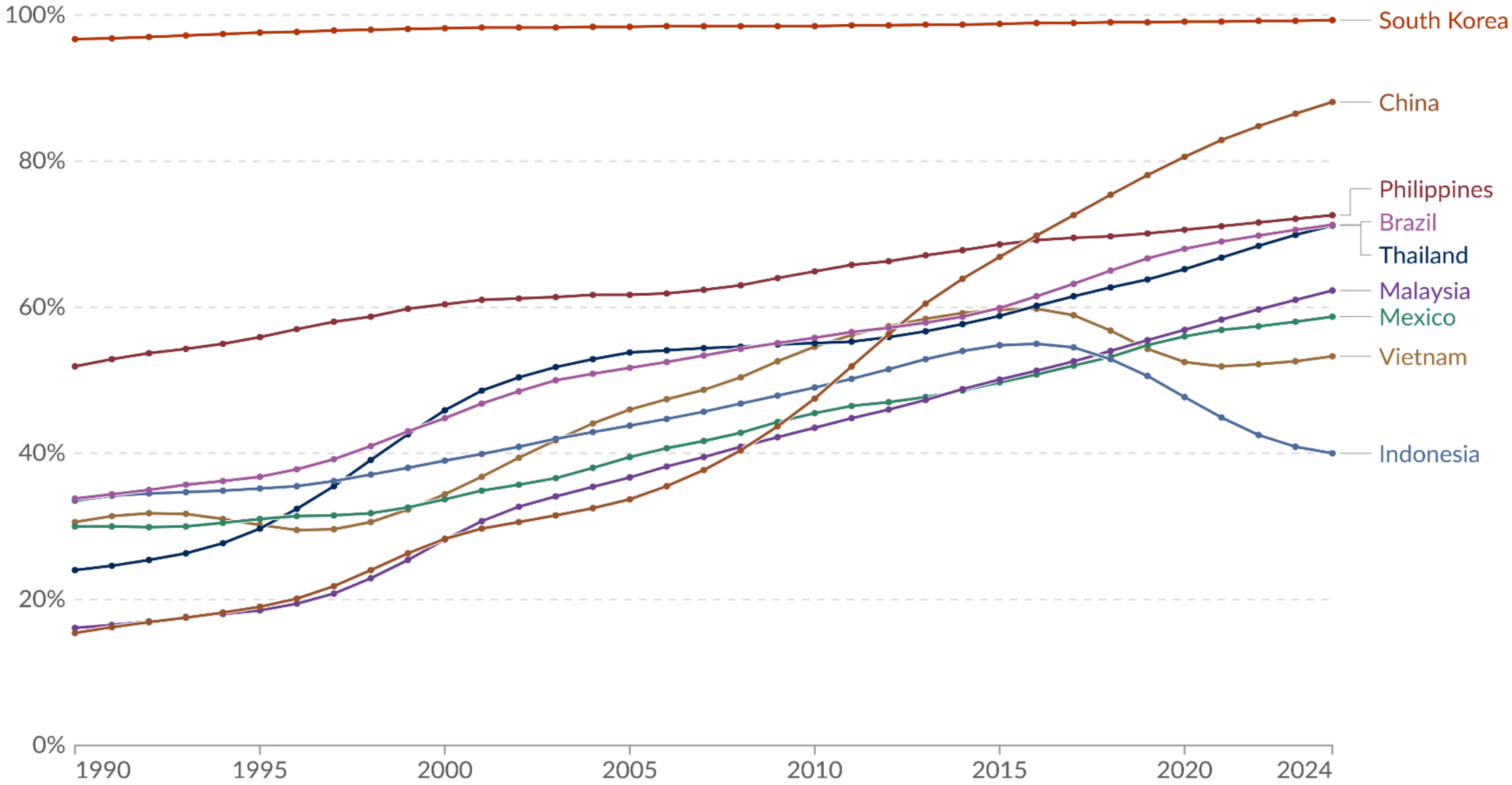
- As a result, manufacturing productivity growth in Mexico has been stagnent.
- Indonesia is a poor performer among East Asian countries.



A Key Lesson from the Case of Mexico

- Mexico: Maquiladora Case
  - Rapid growth of maquiladoras (export assembly plants) in border cities after NAFTA.
  - 15–17 year-olds could easily find low-skill, low-wage factory jobs.
  - Lower human capital accumulation, limiting long-run productivity growth.
- Indonesia: Relevant facts
  - Labor-intensive manufacturing (textiles, footwear, electronics) in clusters around West/Central Java and Batam.
  - Lower upper-secondary enrollment & completion rates among East Asian countries.
  - Human capital formation is curtailed.

Completion Rate of Upper Secondary Education

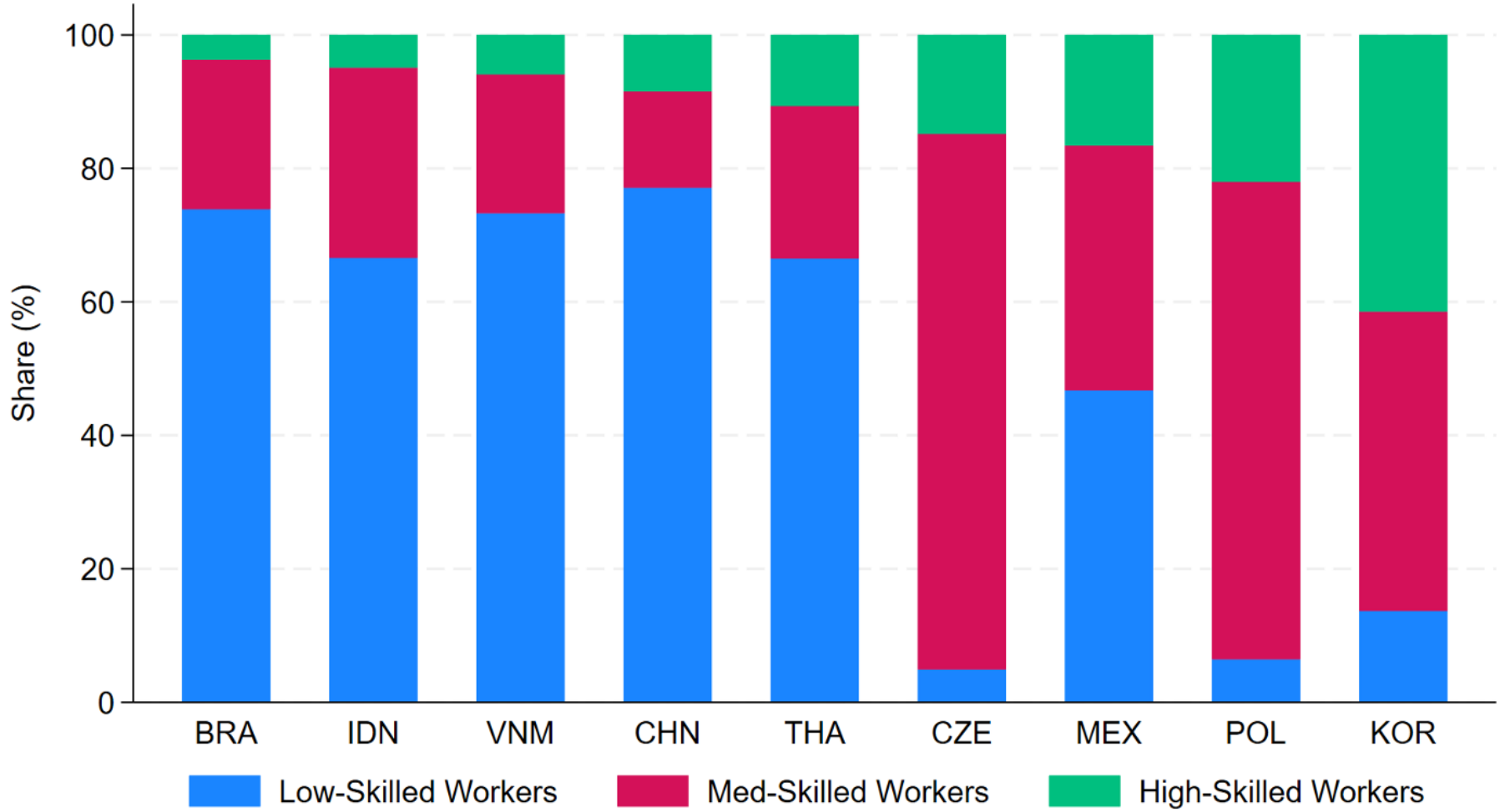


Data source: UNESCO Institute for Statistics (2025)

OurWorldinData.org/global-education | CC BY

Skilled-Workers in Exports (as of 2015)

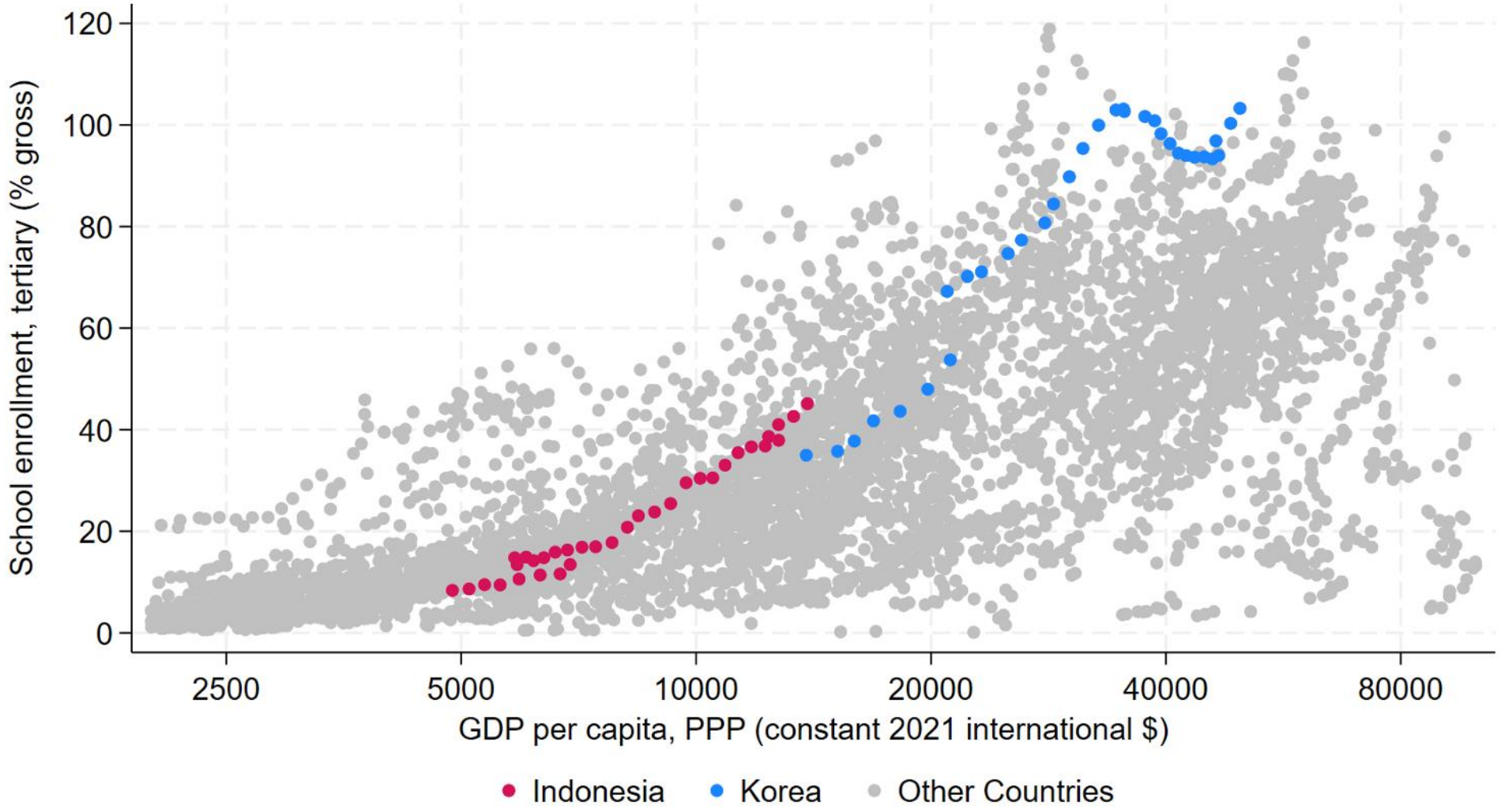
- Contribution of skilled workers in exports $\Longleftrightarrow$ Country's position in GVCs.



Source: OECD TiM 2023 edition

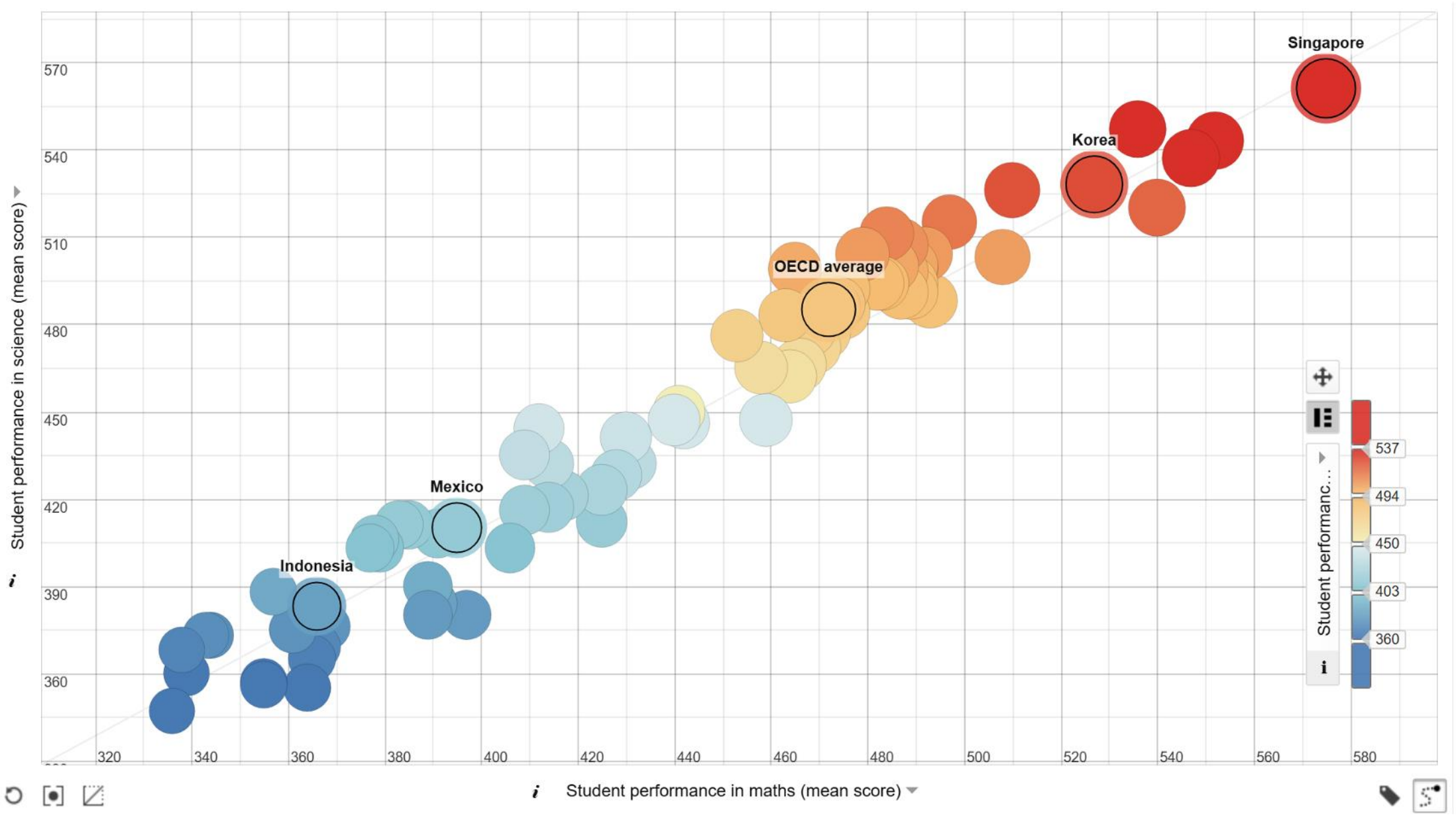
Tertiary School Enrollment (% gross)

- Rapid growth of tertiary school enrollment, but quality matters.



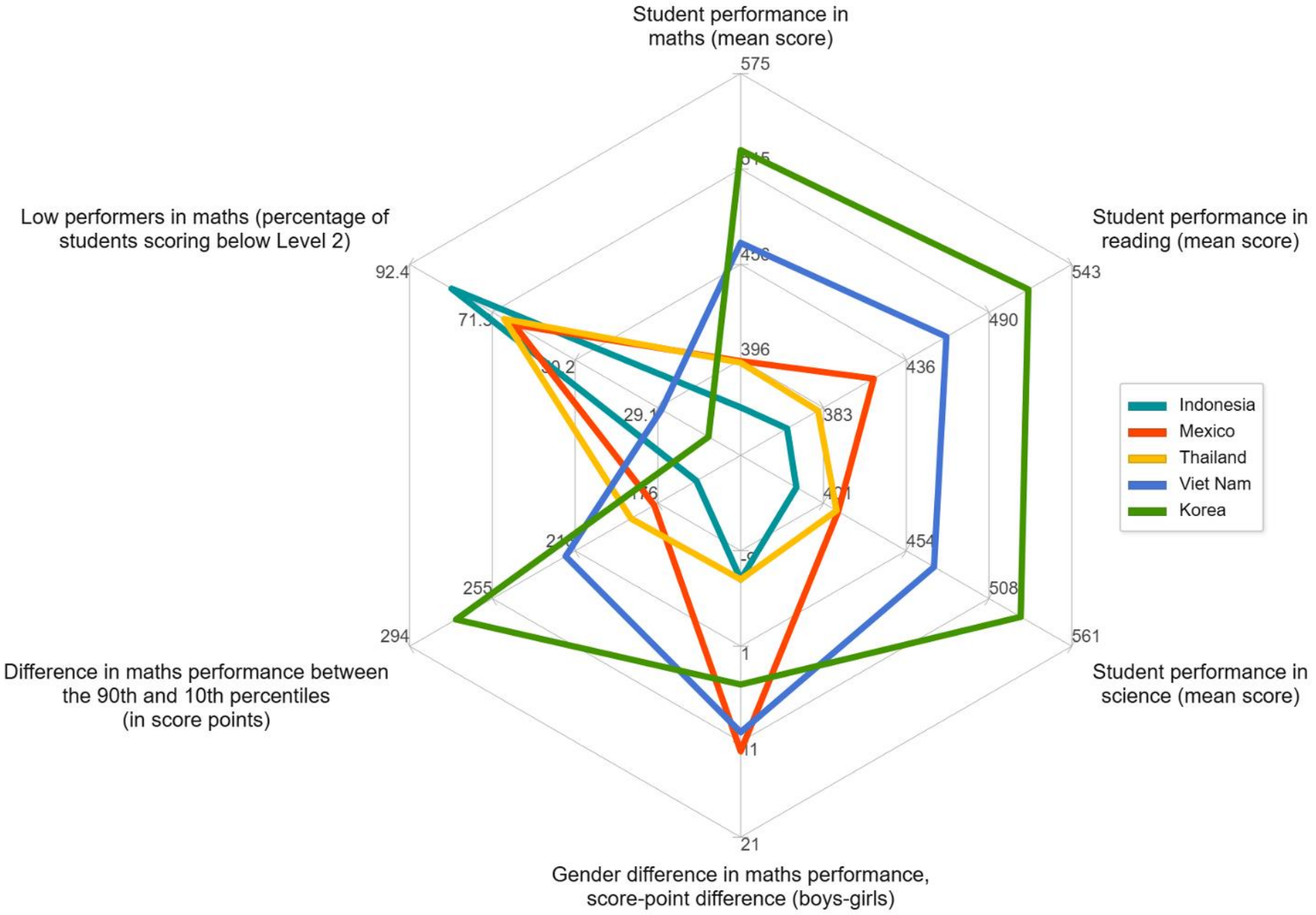
Source: ILO, World Development Indicators

PISA Scores in 2022



Source: http://gpseducation.oecd.org

PISA Scores in 2022



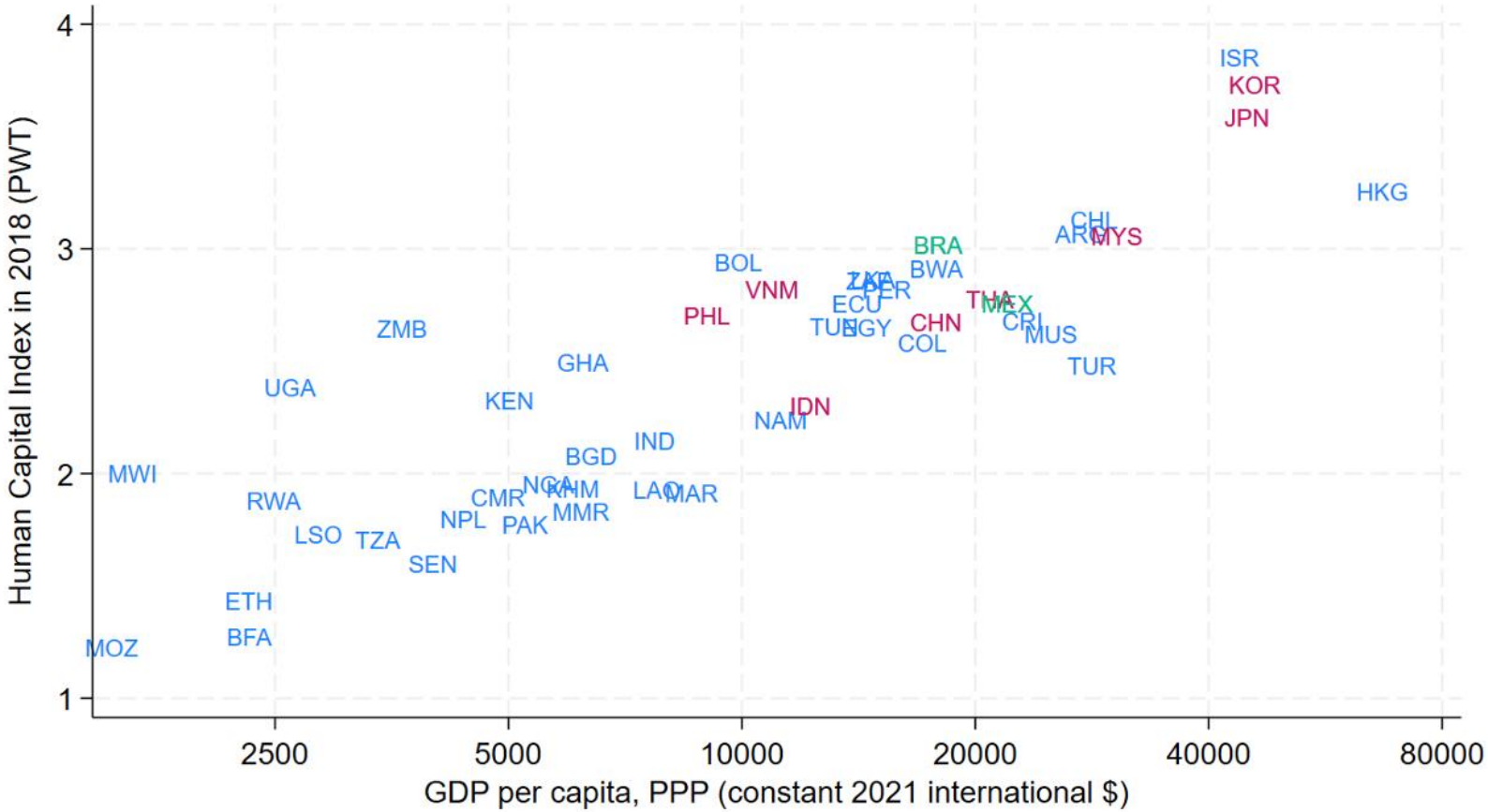
Source: http://gpseducation.oecd.org

How Has Korea Successfully Upgraded along GVCs?: Labor Supply View

- 1960s–1970s
  - Universalization of primary and secondary education → Literacy rapidly increased.
  - Vocational Training Act (1967) → Expansion of technical high schools and training centers
  - Supplied workers for light industries and early heavy-chemical industries
- 1980s
  - Education Reform (1980) → Surge in tertiary education, especially in engineering/science
  - Established KAIST (1971), POSTECH (1986) → Stronger industry–university collaboration
  - Supported upgrading into electronics, automobiles, and mid-tech manufacturing
- 1990s–Present
  - Higher education massification (college enrollment surpassing 50%).
  - ICT education strengthened under government's informatization policies (1990s).
  - Policies like BK21 (Brain Korea 21), STEM promotion programs (2000s–).
  - Entry into high-tech GVC segments (Semiconductor, ICT, biotech, advanced materials).

Conclusion

- Human capital is important for GVC upgrading, and ultimately GDP growth.



- Does it sound like a cliché? Let's put it this way:

Timely, stage-appropriate supply of skilled labor is essential in GVC upgrading.