

# Discussion of Technology Adoption and Late Industrialization by Jaedo Choi & Younghun Shim

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# How South Korea got it right

**Table 1. Comparative growth experience**

Country	Per-capita GDP, 1960 (1985 dollars)	Per-capita GDP, 1989 (1985 dollars)	Per-capita GDP, growth, 1960–89 (%)
South Korea	883	6206	6.82
Taiwan	1359	8207	6.17
Ghana	873	815	-0.54
Senegal	1017	1082	0.16
Mozambique	1128	756	-2.29
Brazil	1745	4138	3.58
Mexico	2798	5163	2.36
Argentina	3294	3608	0.63

Source: Penn World Table 5.5.

Source: Rodrik, 1995

# How South Korea got it right

- Various theories:
  - Export-led growth supported by import-substitution policies, ER devaluation
  - Industrial policy through subsidies, credit allocation (Choi & Levchenko, 2022)
  - Support to private investment through investment subsidies, administrative guidance and the use of public enterprise (Rodrik, 1995)
- Still unclear (to me): **why did it work in South Korea and not elsewhere?**
  - Targeting upstream industries (Liu, 2019)
  - Targeting (latent) comparative advantages (Lin, 2009)
  - Targeting particular clusters by “increasing the supply of skilled workers, encouraging technology adoption, and improving regulation and infrastructure” (“Soft” industrial policy for Harrison and Rodriguez-Clare, 2010)
- This paper: **Adoption of foreign technology and local spillovers**

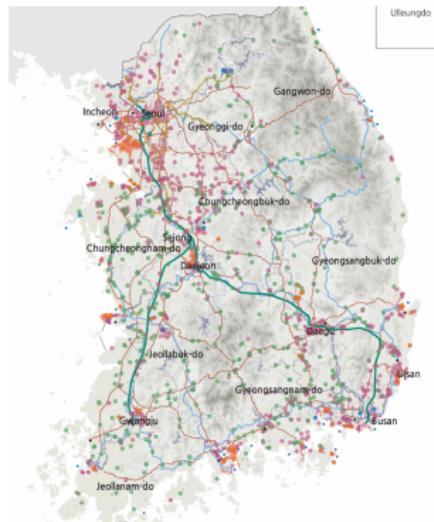
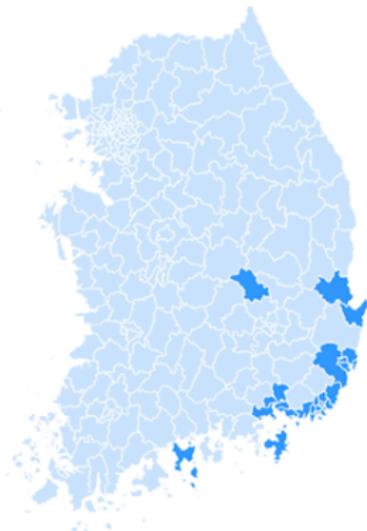
# Overall Assessment

- A fascinating research agenda!
- Bringing together historical micro data and modern empirical methods + informative quantitative frameworks to dig into the microeconomic mechanisms of the South Korean miracle
- Empirical evidence:
  - Winners vs losers research design
  - Winners take all? Technology adoption  $\uparrow$  sales and TFP by 40-50% after 2-3 years
  - Not all, thanks to spillovers: A one-std  $\uparrow$  in proximity to same-sector adopters  $\uparrow$  sales by 10-15%
  - Proximity to adopters also increases the propensity to adopt foreign technologies (thus contributing to the 10-15%  $\uparrow$  in sales?)
- Quantitative results:
  - Spillovers in technology adoption generate dynamic complementarities in firms' decisions
  - Initial conditions / public subsidies matter due to multiple equilibria
  - Temporary subsidies increase welfare permanently by 10%

# Main comment: The role of initial conditions

- Paper has a possible story for the South Korean miracle: Industrial policy targeted the right “clusters”, which maximized spillovers (of technology adoption among other things)
- Unfortunately, the geographic dimension is not exploited as much as it could.
- In the model:
  - Initial conditions matter but geographic structure is very stylized (firms are evenly distributed within a region)
  - Calibration does not use fine-grained geography
- In the data:
  - What is the ex-ante spatial distribution of firms / of early adopters?
  - How big the miracle in a counterfactual world displaying a different initial distribution of firms? (e.g. randomly distributed firms?)
  - All the more important since the spillovers seem very local

# The spatial distribution of industrial clusters



Source: Choi & Levchenko (2022) <http://nationalatlas.ngii.go.kr>

“Six locations (Changwon, Yecheon, Onsan, Okpo, Anjeong, Jukdo) were initially chosen. Two other places (Ulsan, Pohang) were added in late 1974 and another (Gumi) in 1977. These areas had previously been remote rural areas but grew rapidly under the policy.” (Kim et al, 2021)

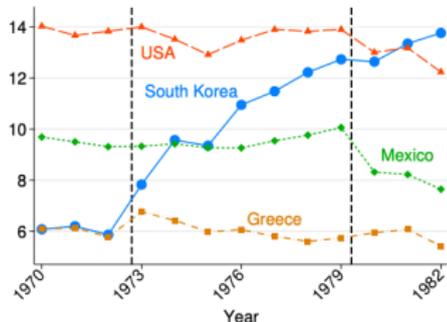
# Boring details

- Timing? # of new foreign technology adoption explodes in 1978 [▶ Details](#)
- **Correlation between technology adoption and public subsidies (Choi & Levchenko)?**
- How does the matching of firms account for their possible geographic proximity? (Losers contaminated by spillovers?)
- Does the matching exclude future adopters? Selection of the least performing firms?
- Is the network of foreign and domestic firms one-to-one? (eg foreign firms negotiating with multiple domestic firms and canceling once one deal is settled)

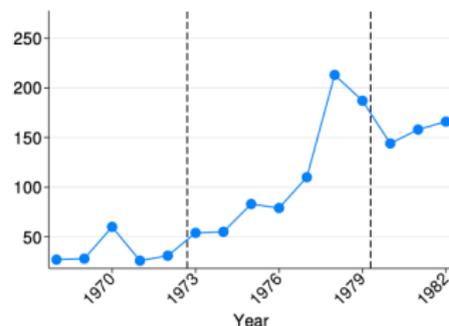
# Conclusion

- Cool paper, read it!
- But at the end: How did South Korea get it right?

# Timing?



A. Heavy mfg. share of GDP (%)



B. # of new foreign technology adoption contracts made by South Korean heavy mfg. firms, 1968-1982

Figure 1. Late Industrialization and Technology Adoption in South Korea

**Notes.** The two dotted vertical lines represent the start and end of the South Korean government policy that subsidized technology adoption from 1973 to 1979. We obtain data on heavy manufacturing's share of GDP across countries from the OECD's STAN Structural Analysis Database and the OECD National Accounts Statistics database.