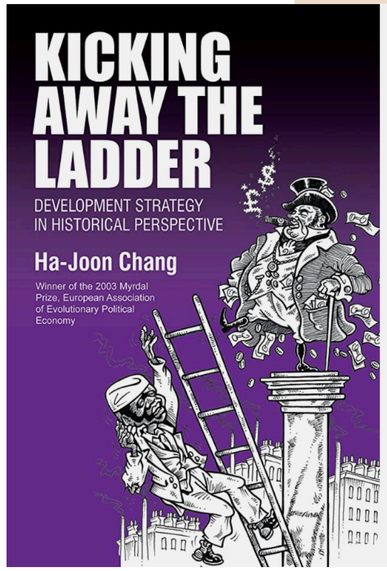
Automation and Comparative Advantage

Discussion for Japan Economic Seminar

Conor Walsh

Can rich countries “kick away the ladder”?

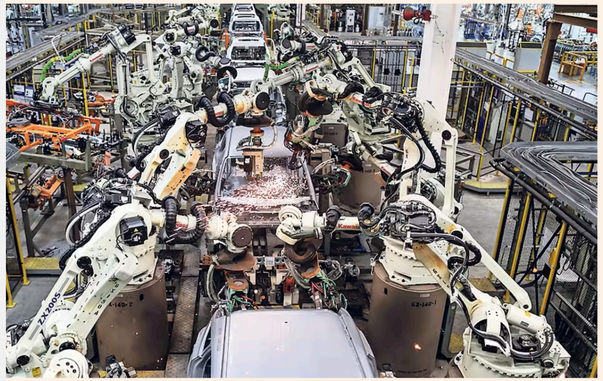
Does technical progress/policy in the rich world undermine development in poorer countries?



Special Report San Francisco + Add to myFT

Cheap automation raises risk of ‘premature deindustrialisation’

Industrialisation made the west rich, but emerging economies may have to miss it out altogether



ines on a Ford Focus production line in China © Dario Pignatelli/Bloomberg

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Special report | Sew what now?

Worries about premature deindustrialisation

Automation is less of a threat to workers in the emerging world than it is made

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I EXPORTS 60% more ready-made garments than India, a country
nt times its population. On the busy roads of Dhaka, Bangladesh's

This Paper

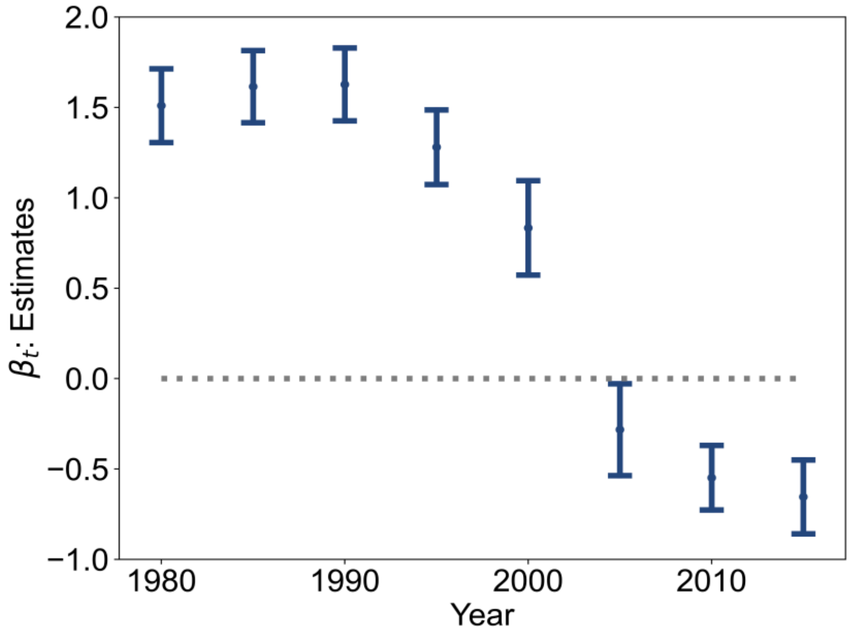
1. **Empirical**: provides evidence that specialization patterns have changed
    - Factor abundance (skill-unskilled) is no longer as predictive of trade flows for developing countries

2. **Mechanism**: Links this to robot adoption in certain manufacturing industries

3. **Theory**: Combines task framework of automation (Acemoglu Restrepo) with multi-sector Armington trade model

Mechanism: Does the timing line up?

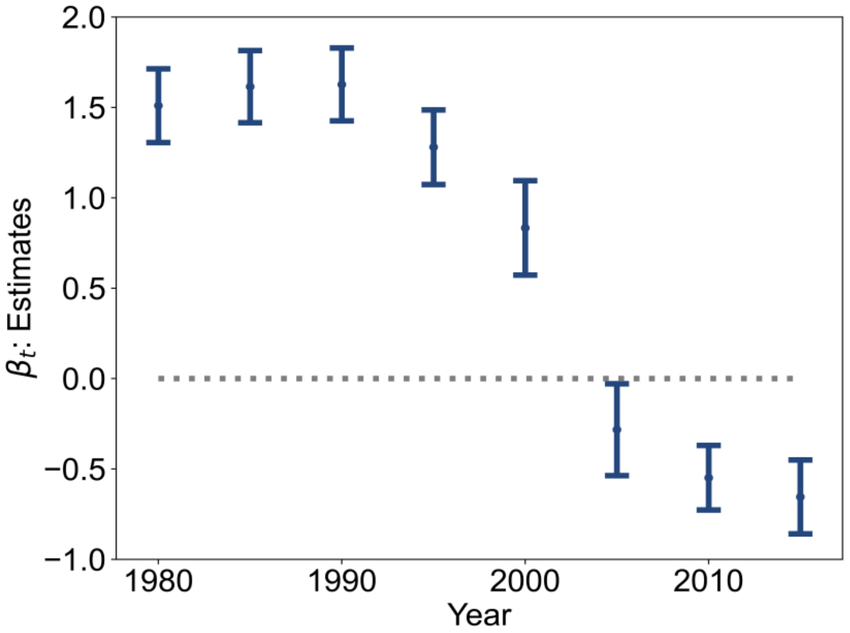
Figure 3: Comparative Advantage over Time



Note: The figures show the estimates of coefficients β_t in equation (1) in each point time separately. Bars indicate 95% confidence intervals based on heteroskedasticity-robust standard errors.

Mechanism: Does the timing line up?

Figure 3: Comparative Advantage over Time



Note: The figures show the estimates of coefficients β_t in equation (1) in each point time separately. Bars indicate 95% confidence intervals based on heteroskedasticity-robust standard errors.

Acemoglu Restrepo 2020 JPE

There are relatively few robots in the US economy, so the number of jobs lost due to robots has been limited thus far (a 0.2 percentage point decline in the aggregate employment-to-population ratio, or about 400,000 jobs). However, if robotics technology proceeds as expected by experts over the next two decades (e.g., Brynjolfsson and McAfee 2014, 27–32; Ford 2015), the future aggregate implications of robots could be larger.

- One way to read Acemoglu Restrepo is that the effect of robots on US employment and wages has so far been tiny (though maybe important in the future)
- Effect on wages of <1% 2000 to 2010
- It seems that to change trade patterns in a meaningful way, robots should first be changing US/EU employment in "robot-affected" industries in a large way
- So far, no much evidence of "labor replacing" in the US

Mechanism: Disentangling Causes

- Probably need to do tests of alternative hypotheses
- Obvious one is the China shock
  - This doesn't mean leaving China out of the regressions
- "Robot-exposed" industries are automotive and electronics, with 67 sub-industries
- Predict exports in these industries by year, controlling for
  1. Robot exposure (using US-Germany adoption data)
  2. Chinese exports in the same industry
  3. Factor endowment changes in the home country

Theory

- Currently, the theory only focuses on sectoral specialisations
- Welfare absent, misses whether we should be worried or not
- After all, you always have a comparative advantage in *something*
  - Does this mean developing countries shift more into high-skill manufacturing/ services?
  - Isn’t that what they want to do anyway?
- *Suggestion*: Endogenize technical change and automation, bring in flavor of older growth/trade papers

Theory

THE NARROW MOVING BAND, THE DUTCH DISEASE, AND THE COMPETITIVE CONSEQUENCES OF MRS. THATCHER

Notes on Trade in the Presence of Dynamic Scale Economies

Paul KRUGMAN

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This paper presents a model of trade in which comparative advantage, instead of being determined by underlying attributes of countries, evolves over time through learning-by-doing. In this model, arbitrary patterns of specialization, once established, tend to become entrenched over time. The model sheds light on three widely held views that do not make sense in more conventional models. First is the view that temporary protection of selected sectors can permanently alter the pattern of comparative advantage in the protecting country's favor. Second is the view that seemingly favorable developments, such as the discovery of exportable natural resources, may lead to a permanent loss of other sectors and reduce welfare in the long run. Third is the possibility that a temporary overvaluation of a currency due to tight money can lead to a permanent loss of competitiveness in some sectors.

Conclusion

- Great new fact!
- Nice idea and potential explanation
- Needs more work on understanding the contribution of automation
- Look forward to seeing how the theory and paper develops!