Robot Adoption and Inflation Dynamics

by Henrique Basso and Omar Rachedi

Discussion

by Dominik Thaler (ECB)

Views are my own.

Summary

- Show empirically that automation flattens the (regional old Keynesian inflation-unemployment) Phillipscurve in the US
- This is particularly so in highly unionized cities

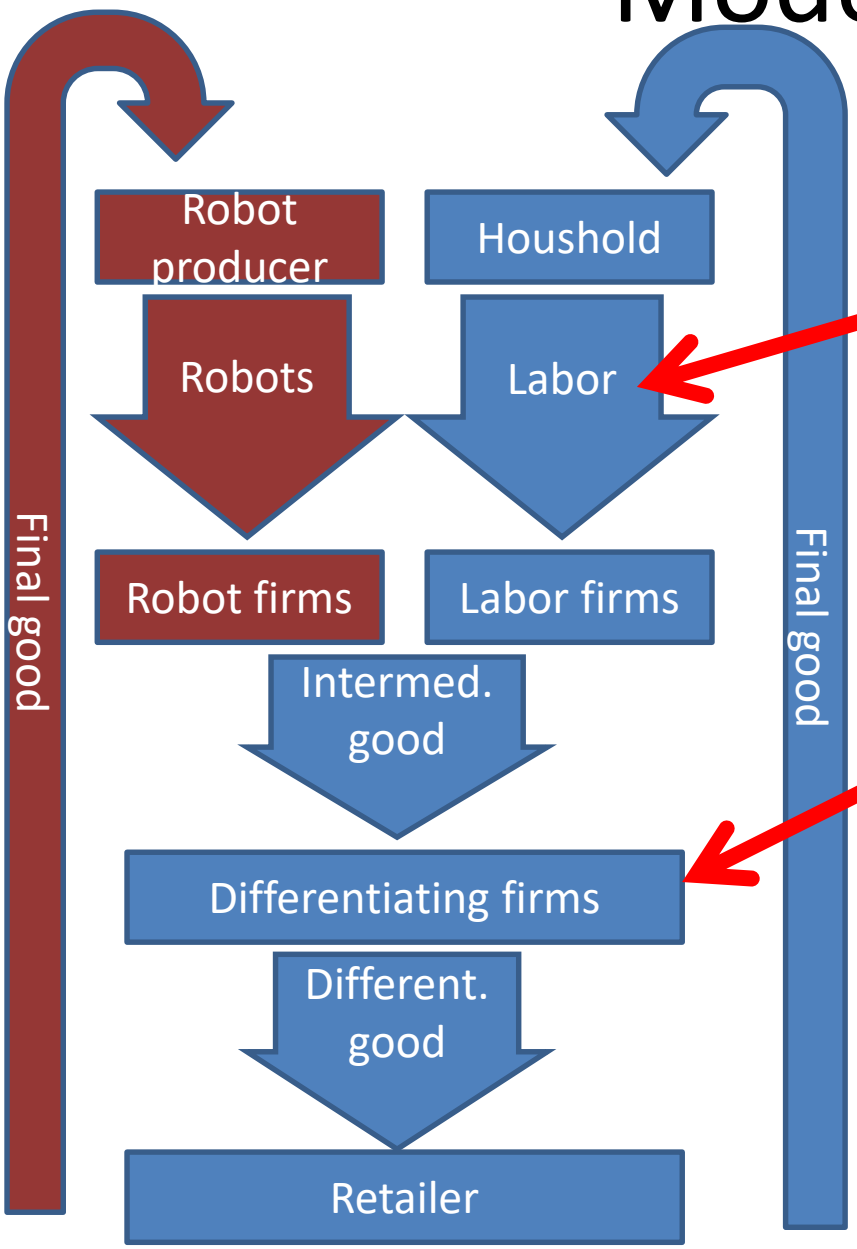
- Build a model to explain this finding qualitatively and quantitatively
- Automation explains reduction in PC slope of 9% over 50 years (literature: 68%)

Summary

- Relevant macro question
- Empirical results are clear and robust
- Model is neat (more later)
- Link between the two is excellent
- Results are economically meaningful but not implausibly large

- Poster child macro paper

Model



Real friction:
(Directed) search and matching
➔ Time-varying unemployment

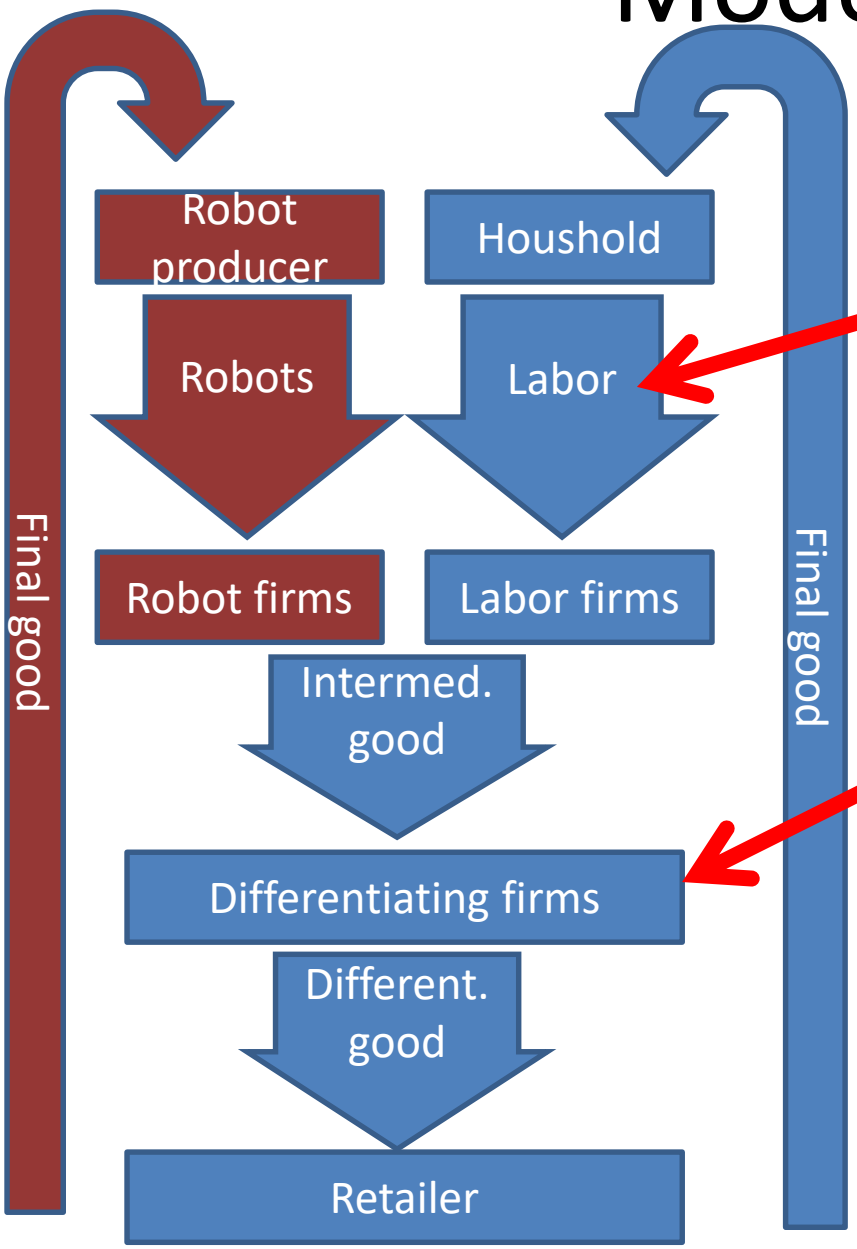
Nominal friction:
Sticky prices
➔ Time-varying markup

Comment 1: NK Unemployment Literature

- Models of unemployment
  1. Re-interpetation of Sticky Wage model (*Gali, 2011*)
  2. Search and matching with sticky wages (*Thomas, 2008*)
  3. Search and matching with sticky prices (*Monacelli, Perotti, Trigari, 2010*):

- Relate model (without robots) to NK unemployment literature 3

Model



Real friction:
(Directed) search and matching
➔ Unemployment as function of marginal costs

$$\widehat{q_{P,t}} = \frac{\bar{u}}{1-\bar{u}} \times \cdots \frac{1}{\left\{-\frac{\eta}{1-\eta} - \frac{\eta\gamma_M}{\varpi_1(\bar{\gamma}^\star)}\left[\frac{1}{1-\eta}\varpi_2(\bar{\gamma}^\star) - \varpi_3(\bar{\gamma}^\star)(1+\varpi_2(\bar{\gamma}^\star))\right]\right\}}\hat{u}_t$$

Nominal friction:
Sticky prices
➔ Phillips curve in marginal costs

$$\hat{\pi}_t = \frac{\epsilon - 1}{\phi}\widehat{q_{P,t}} + \beta\mathbb{E}_t\left[\hat{\pi}_{t+1}\right],$$

$$\hat{\pi}_t = \Psi(\Theta;\bar{u};\bar{\gamma}^\star)\hat{u}_t + \mathbb{E}_t\left[\beta\hat{\pi}_{t+1}\right]$$

Comment 2: Which phillips curve?

- 2 New Keynesian Phillipscurves:
  1. The marginal cost PC: empirically steep
  2. The unemployment PC: empirically flat

  (*Gagliardone, Gertler, Lenzu, Tielens, CHAMP 2024*)
- Search and matching alone can explain differences in slopes
- Automation lowers the slope of 2 further
- (Unfair) Question: Evidence that automation affects 2, but does not affect 1?

Comment 3: Why does the SS level of automation matter for the PC?

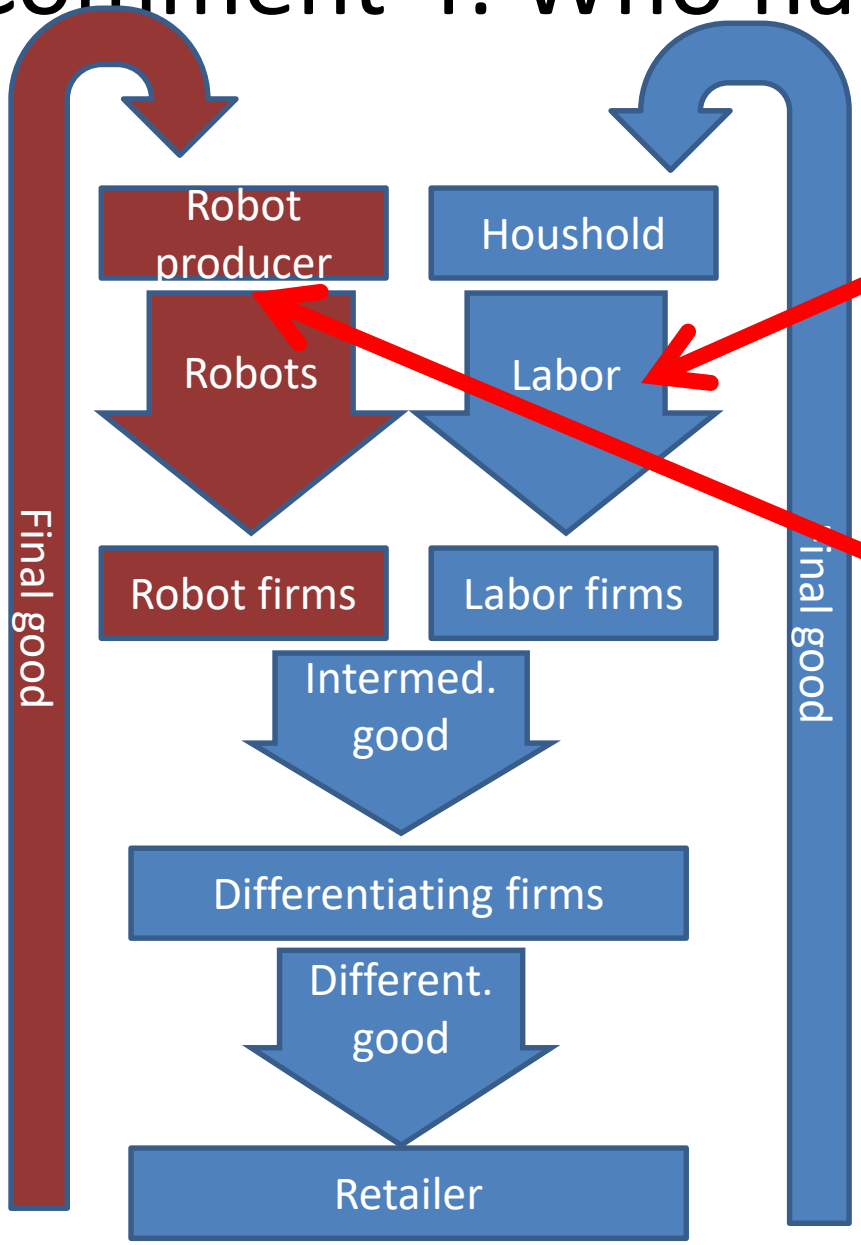
- Why does an increase in marginal costs decrease unemployment?

  Inflation ↑ → Markup ↓ → Price of intermediate good ↑ → Vacancies ↑ → Unemployment ↓

  → ~~Workers market power~~ ↑ → Labor share ↑ → Unemployment ↑

- Why does automation strengthen the marginal cost - unemployment pass-through?
  - Automation reduces workers market power, as the labor share goes up automation becomes more competitive
  - Not quite sure why this effect depends on the SS level of automation and not on the existence of robots per se

Comment 4: Who has market power?



- (Directed) search and matching
- ➔ Market power
- Elastic supply
- Heterogenous productivity

- Frictionless market
- ➔ No market power
- Inelastic supply
- Homogenous productivity

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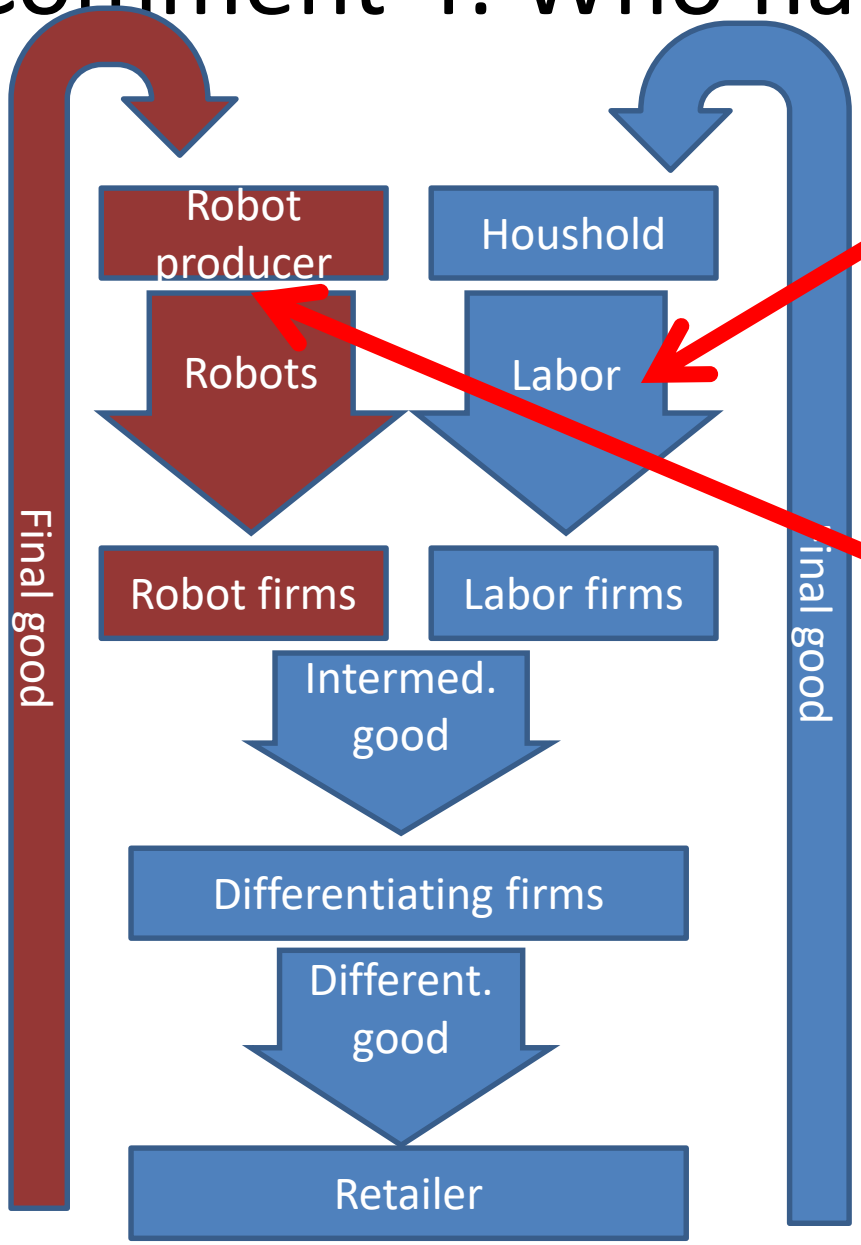

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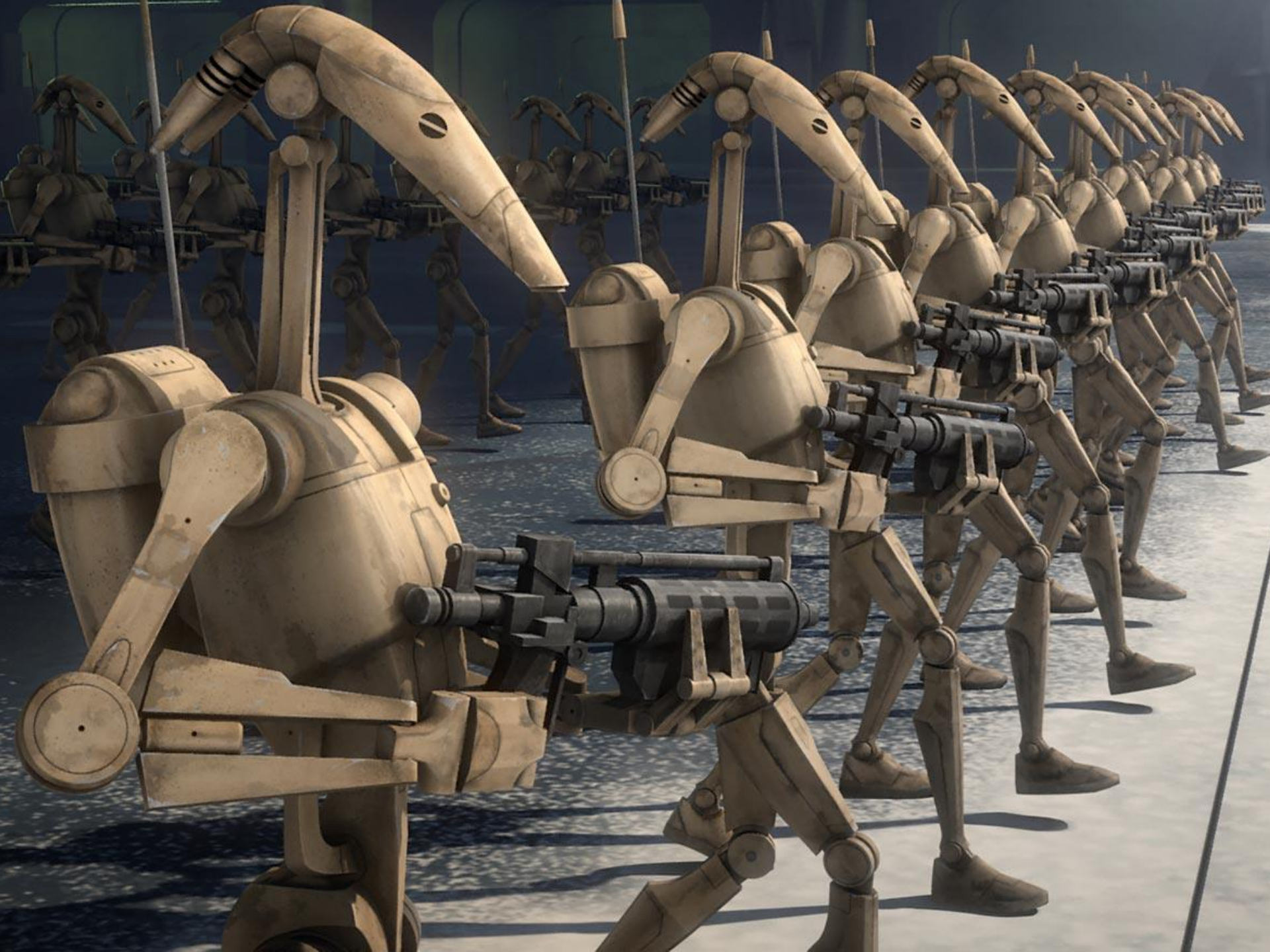
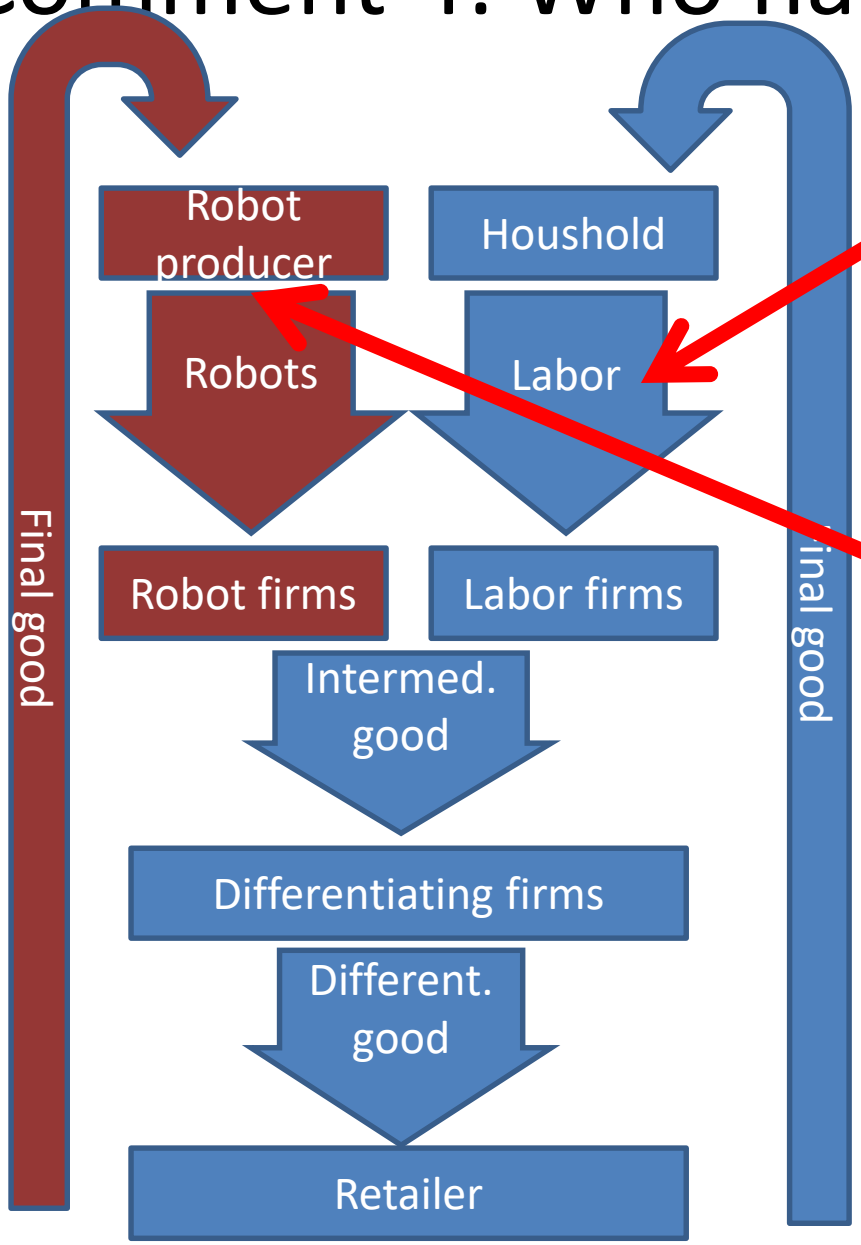
Is it plausible that *robots* have no market power?



Comment 4: Who has market power?



- (Directed) search and matching

➔ Market power

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Is it plausible that *suppliers of automation* have no market power?


STOP
BIG
TECH
AI

Small comments

Questions

- Why not MP shock?
- How does optimal policy (monetary and tax/subsidy on robots) look like in this kind of model?
- Couldn't you get a flattening of both PCs in a simple adaption of Gali's(2015) reinterpretation of the NK model, if you add robots as a factor of production that is a imperfect substitute for labor.
- Why do we need entry cost? What does it imply that their share in total cost of production varies with cost of robots?

Editing

- P3: No role for uncertainty. No need to mention it here.
- P 7: Why exclude rents and utilities from price index
- P 14: text: nominal / appendix: real entry and search cost. I assume the appendix is right.
- P 15 equ (10) max w missing
- P 18: Profits should be 0 in expectation and on average across producers.
- P 21: 2nd parameter in Theta not correctly explained in the text
- P21: uhat not defined
- P 22 equ (33): doesnt J directly depend on w? What's the real wage here (definition missing)?
- Specify your random search model? What's the HHS outside option? Whats the firms outside option? What does it imply that the Nash parameter is .99?
- P23 2nd half: Claims not shown anywhere
- PC may flatten because of market concentration (Andres, Arce, Buriel BdE 2021)