Discussion on "Trade and Technology Compatibility in General Equilibrium" by Weili Chen, Jingting Fan, Wenlan Luo

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Introduction

- Provide a theory of endogenous technology/trade cost
- Empirical evidence supports a positive correlation between trade and technology proximity at both the country level and firm level
- Firms source intermediate inputs from other firms; inputs are more efficient if they are more compatible
- The paper theoretically formalizes a compatibility incentive in firms' endogenous technology choice

Theory

- The difficulty lies in that firms' heterogeneity in technology choice has to consider the whole distribution to form an equilibrium

- Provide sufficient conditions for the existence and uniqueness of such equilibrium and numerical solutions to quantify counterfactuals

Model

A theory of endogenous technology/trade cost

The share a firm θ in d buy from oj:

$$\chi^j_{do}(\theta) = \frac{\left[\tau^j_{do}\Lambda^j_o(\theta;\tau)\right]^{-\zeta}}{\Phi^j_d(\theta)}$$

$\Lambda^j_o(\theta;\tau)$: firm-specific trade cost

Model

- Model structure:
  - Underlying distribution $\bar{\theta}$
  - Cost of changing technology: $1 - \exp\left(-\bar{\phi} \cdot (\bar{\theta} - \theta)^2\right)$
  - Benefit of being closer: $\exp\left(\bar{t} \cdot (\theta - \tilde{\theta})^2\right)$
  - direct trade elasticity ζ

- Firms choose optimal technology $\theta_d^i(\bar{\theta})$ through profit maximization
- The optimal policy function, together with the location parameters governing price distribution, constitute an equilibrium of technology choice

Comments

- We don't observe a direct measure of the costs/efforts of changing technology
- Welfare implication of trade cost:
  dW= direct effects of τ + endogenous effects of T - adjustment costs

  If the endogenous technology choice amplifies the trade cost effect, how does it depend on maybe $\frac{\bar{t}}{\bar{\phi}}$?

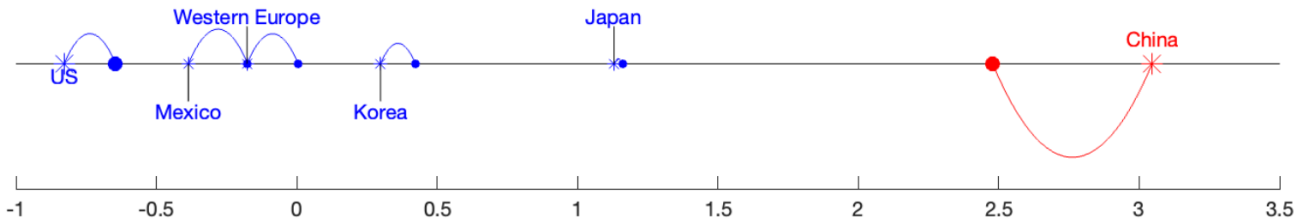
  Possible simplification: one sector, degenerated distribution $\bar{\theta}^i_d$, normal assumptions, and quadratic approximation, can we get how $\frac{\bar{t}}{\bar{\phi}}$ affect trade elasticity and welfare?

Comments

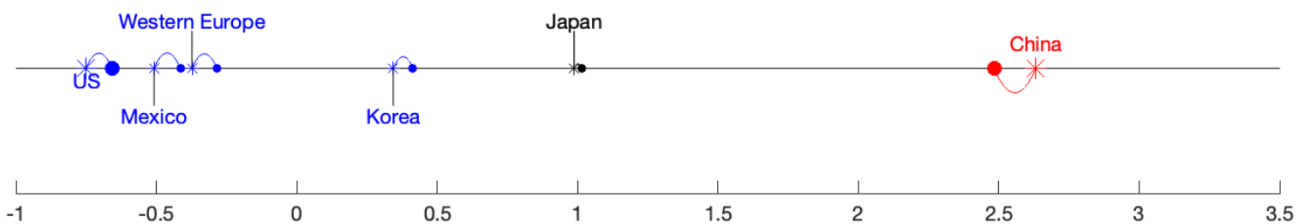
- The elasticity of technology distance to trade cost shock is quantified through reduce-form evidence
  - $\bar{\phi}$: change of tariff on patent citation
  - $\bar{t}$: cross-firm extensive margin import-citation correlation
- use extensive-margin import-citation correlation instead of shares

Comments

- Examine the welfare cost of the trade conflict between the U.S. and China in the semiconductor industry
  - Decoupling of technologies between the US and China
  - Realignment of other countries



(a) The Average Technology in the Targeted Sector



(b) The Average Technology of Other Sectors

Do they pay adjustment cost from $\bar{\theta}$ or $\theta(\bar{\theta})$? a flow cost

Comments

- map the citation to the proximity
- $\zeta = 4$?
- tariff vs. trade cost
- externality

Comments

It's a very interesting paper! It is very carefully thought out and implemented.