

AI and Trade

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Company

Apple

Alphabet

Microsoft

Amazon

Berkshire Hathaway

Facebook

ExxonMobil

Johnson & Johnson

JPMorgan Chase

Wells Fargo

Company

Apple

Alphabet

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ExxonMobil

Johnson & Johnson

JPMorgan Chase

Wells Fargo

Tencent Holdings

Alibaba

- ▶ Economies of Scale
 - ▶ Data
 - ▶ AI capabilities (people)
 - ▶ Scope (multiple apps)
- ▶ Knowledge creation and diffusion

Theories of Trade and Growth – Benchmark Model I

1. Specific factors model:

- ▶ Two sectors: search engines (with ads) and clothing.
- ▶ Scientists are used in AI, labour used in both sectors.
- ▶ No scale or knowledge.
- ▶ \Rightarrow **Free Trade**.

2. Heterogeneous scientists (Add profits)

- ▶ Scientist/firm quality q .
- ▶ Number of users $u(q)$, increasing in q .
- ▶ Advertising activity a at cost $c(a)$.
- ▶ Revenues per user $r(a)$, increasing in ads.
- ▶ Profits $\pi(a, q) = r(a)u(q) - c(a)$.
- ▶ $\pi_{aq} > 0 \Rightarrow q \uparrow \rightarrow r, \pi \uparrow$:
- ▶ **better scientist/firms are bigger and more profitable.**
- ▶ \Rightarrow **Strategic Trade Policy**.

3. Superstars scientists

- ▶ So far, no scale or knowledge creation/diffusion.
- ▶ Skewed market share: Google has 44% of searches, Bing, Yahoo and Baidu each have 12%, and no other big players.
- ▶ Number of users convex in quality: $u_{qq} > 0$.
- ▶ Profits and the earnings of scientist are convex in quality.
- ▶ Stronger case for \Rightarrow **Strategic Trade Policy**.
- ▶ \Rightarrow **inequality!**

Trade Theory: Role of Scale and Knowledge

$$q_i = Q^\alpha f(l_i, k_i), \quad Q \equiv \sum_j q_j, \quad 0 < \alpha < 1$$

- ▶ **National** vs. **International** returns to scale.
- ▶ **Local** vs. **International** knowledge diffusion.
- ▶ Evidence: DRAMs, Azoulay et al. Need more!
- ▶ We draw implications for the design of cluster policies such as the Vector Institute.

Privacy

- ▶ Privacy as a right vs. Data as a driver of AI innovation.
 - ▶ **Weak privacy laws are a source of comparative advantage.**
 - ▶ **Race to the bottom.**
 - ▶ **Policy inflexibility and incumbency lock-in.**
- ▶ Trade negotiations:
 - ▶ TPP – aspirational.
 - ▶ NAFTA 2.0: US pressure for a race to the bottom.

Main Trade Issues

1. Privacy.
2. Data localization.
3. Property rights over data.
4. Privileged access to government data.
5. Regulation of AI (including standards settings, transparency).
6. Protection of source code.

Key Themes

1. Internationalization of AI (esp. China)
2. Role of scale and knowledge creation/diffusion.
3. Behind-the-border policies can lead to:
 - ▶ Innovation and consumer gains.
 - ▶ Source of comparative advantage.
 - ▶ Incumbency advantage.
 - ▶ Race to the bottom.
 - ▶ Regulatory flexibility.