Discussion of “AI and Trade”

Dave Donaldson

MIT
Open Economy Dimensions of AI

- Goldfarb and Trefler provide a wide-ranging, creative, and thoughtful discussion of the issues

- High-level summary:
  - AI is a production technology
  - So it has the same implications for trade policy, as a function of its technological characteristics, as we are used to thinking about:
    - ⇒ factor prices, inequality (e.g. Trefler, 1993; Trefler, 1995)
    - ⇒ complications with mobile factors
    - ⇒ trade policy (including “behind the border”) as industrial policy if geographically local externalities (e.g. EES, knowledge spillovers) and/or market power

- But, a lot of uncertainty about what those characteristics will actually look like...
Potential Externalities from AI Technology

- Economies of scale (R&D, data)
  - But are they external to firms?
  - Is AI (or training data) not a service that can be bought/sold?

- Knowledge spillovers
  - But how geographically far will those spillovers spill?
  - Evidently, quite far within firm (e.g. London, Edmonton)

- ...and then there is the usual problem of picking winners
  - McKenzie et al (2017): Predicting which entrepreneurs have good plans
The Home-Market Effect

• Definitions:
  • Weak HME (Linder, 1961): Home demand ⇒ export more
  • Strong HME (Krugman, 1980): Home demand ⇒ net export more

• Home-biased positive externality (+ some trade friction) ⇒ HME
  • Stronger externality ⇒ stronger HME
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- What do we know about the HME in an innovation/intensive industry?

  - Costinot, Donaldson, Kyle and Williams (2016): strong HME in global pharma
  - As-if EES revenue elasticity is about 0.8 (=1 in usual trade/growth models).
  - Bartleme et al (2017): between 0.55-0.78 across all 2-digit manufacturing sectors
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Is AI Technology Purely a “Domestic” Technology?

• Likely to have effects on technology of bilateral trading too
Trading Frictions Are Important—“The World Is Not Flat”

Leamer: A Review of Thomas L Friedman’s The World is Flat

Figure 8. West German Trading Partners, 1985
Trading Frictions Are Important—"The World Is Not Flat"

Figure 2: Trade is inversely proportional to distance

(a) France’s exports (2006)  
(b) France’s imports (2006)

exports/Partner’s GDP (%, log scale)  
exports/Partner’s GDP (%, log scale)

distance in kms  
distance in kms

slope = -.683  
slope = -.683

fit = .22  
fit = .22

.005  
.005

.05  
.05

1  
1

500  
500

1000  
1000

2000  
2000

5000  
5000

10000  
10000

20000  
20000

EU25  
EU25

Euro  
Euro

Colony  
Colony

Francophone  
Francophone

other  
other

By contrast with 1995, gravity is now an integral and important part of international trade. We view its recent inclusion as a core element of the field as being articulated in three distinct steps:

1. A brief history of gravity in trade

While economists have been estimating gravity equations on bilateral trade data since Tinbergen (1962), this work lay outside of the mainstream of trade research until 1995. One of the barriers to mainstream acceptance was the lingering perception that gravity equations were more physics analogy than economic analysis. In the first volume of this Handbook series, Deardorff (1984, p. 503) characterized the "theoretical heritage" of gravity equations as being "dubious." Given the traditional importance of theory in the field of international trade, this was damning criticism. It was not entirely fair to the economists who had begun the work of grounding the gravity equation in theory long before. Savage and Deutsch (1960) contains a multiplicative model of bilateral trade published two years before the empirical work of Tinbergen (1962). Although that model was purely probabilistic, Anderson (1979) set forth a conventional economic model of gravity. The model did not penetrate the consciousness of trade economists. Leamer and Levinsohn (1995, fn. 13), write "An attempt to give a theoretical foundation by Anderson (1979) is formally fruitful but seems too complex to be part of our everyday toolkit."

By contrast with 1995, gravity is now an integral and important part of international trade. We view its recent inclusion as a core element of the field as being articulated in three distinct steps:
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• Plenty of reasons to suspect this could be a big deal:
  • Lawyers (contracts, compliance)
  • Trade finance
  • Supply chain management
  • Translation
  • Transport
  • Buyer-seller matching platforms

• Exporting/importing firm strategy?
  • Dickstein and Morales (2016), applying tools from Manski (various): Large firms in Chile appear to know about 45% of what they need to know about exporting
Interactions Between AI Technology and Trade Costs

- Most dramatic change in trade costs in recent decades has probably increasing tradability of services.
- Seems likely that those same newly tradable services may see largest disruption from AI.
  - E.g., same features that enable us to import radiology services from India enable us to import radiology services from the cloud.