Information Globalization, Risk Sharing, and International Trade

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Discussion by

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1The views expressed here do not necessarily reflect those of the Federal Reserve Bank of St. Louis or the Federal Reserve System.
This paper:

“...incorporates a simple information asymmetry in a standard, two-country Armington trade and studies its effect on international risk sharing and trade flows.”

“[...] we find that ameliorating information asymmetry–information globalization–reduces trade and risk sharing [...] asymmetric information behave in the opposite manner as standard trade costs.”
Me, This paper, Information and Trade:

\[ t_0 : \text{No signal: (only the authors) Veldkamp and Waugh!!} \]

\[ t_1 : \text{Signal: (the Introduction): OMG!! Hirshleifer and Trade.} \]

\[ t_2 : \text{Realization: (reading the paper) A lot of food for thought.} \]
Road Map

1. An even simpler environment

2. Comments & Concerns

3. My Takeaways
An Even Simpler Armington Model

- Two Countries: 1, 2.
  - Continuum measure one in each.
  - Identical agents (ex-ante and ex-post).
- Two goods: 1,2 (associated to resp. country)
- Preferences:
  \[ U = E \left[ \frac{(c_1)^\theta}{\theta} + \frac{(c_2)^\theta}{\theta} \right] \]
- Timing of trade:
  - **First**: agents in each country realize their endowment:
    - signal about the other country.
  - **Second**: each agent decides how much to export.
  - **Third**: International prices clear.
An Even Simpler Armington Model

- Endowments: Bernoulli distributed.
  
  - Either high ($Y_i^H$) or low ($Y_i^L$); probability=50%. $r \in \{L, H\}$
  
- Distributions are independent across countries (as in BVW).

- Identical across agents within each country
Equilibrium: Complete Information

- Export Prices (good 1 relative to 2): \( p = \frac{X_2}{X_1} \).

- Export Decisions: Each agent chooses \( x_i \), knowing \( X_i \) and \( X_j \):

\[
\begin{align*}
  x_1^r &= \arg \max_x \left\{ \frac{(Y_1^r - x)^\theta}{\theta} + \frac{\left( \frac{X_2}{X_1} \times x \right)^\theta}{\theta} \right\} \\
  x_2^r &= \arg \max_x \left\{ \frac{\left( x \frac{X_1}{X_2} \right)^\theta}{\theta} + \frac{(Y_2^r - x)^\theta}{\theta} \right\}
\end{align*}
\]

- Consistency: \( x_i^r = X_i^r \).
Equilibrium: Complete Information

- Reaction Functions: Country $i$ exports given $X_j$

$$[Y_i - X_i]^{\theta-1} = (X_j)^{\theta} (X_i)^{-1}$$

- If $\theta = 0$ (log preferences)

$$X_i = \frac{Y_i}{2}.$$

- Easy to numerically solve for any $\theta \in (-\infty, 1]$. 

Equilibrium: Incomplete Information

- Ex-Post Export Prices: \( p = \frac{X_2}{X_1} \)

- Export Decisions: Each agent chooses \( x_i \), knowing \( X_i \) but not \( X_j \) (or prices):

  \[
  x_i^r = \arg \max_x \left\{ \left( \frac{Y_i^r - x}{\theta} \right)^\theta + \left( \frac{1}{2} \right) \left( \frac{x X_i^H}{X_i^r} \right)^\theta + \left( \frac{1}{2} \right) \left( \frac{x X_i^L}{X_i^r} \right)^\theta \right\}
  \]

  \[
  x_2^r = \arg \max_x \left\{ \left( \frac{1}{2} \right) \left( \frac{x X_2^H}{X_2} \right)^\theta + \left( \frac{1}{2} \right) \left( \frac{x X_2^L}{X_2} \right)^\theta + \left( \frac{Y_2^r - x}{\theta} \right)^\theta \right\}
  \]

- Consistency:

  \( x_i^r = X_i^r \).
Equilibrium: Incomplete Information

- Export Decisions:

\[ x_1^r = \arg \max_x \left\{ \left( \frac{Y_1^r - x}{\theta} \right)^\theta + \frac{(xp^E)^\theta}{\theta} \right\} \]

- where \( p^E \) is a CES aggregator:

\[ p^E \equiv \left[ \left( \frac{1}{2} \right) \left( \frac{X_2^H}{X_1^r} \right)^\theta + \left( \frac{1}{2} \right) \left( \frac{X_2^L}{X_1} \right)^\theta \right]^{\frac{1}{\theta}} \]

is a CES aggregator of ex-post export prices.

- Again, with log preferences,

\[ X_i = \frac{Y_i}{2}, \]

i.e. the same as with perfect information.
Incomplete Information with Signals

- Let country $i$ observe a signal; $\mu^i \geq 1/2$ probability of true realization $Y_j$
- Export Decisions:

$$x^r_1 = \arg \max_x \left\{ \left( \frac{Y_1^r - x}{\theta} \right)^\theta + \frac{x p^E(\mu^i)}{\theta} \right\}$$

- where the aggregate $p^E$ becomes:

$$p^E(\mu^i) \equiv \left[ \mu^H \left( \frac{X^H_2}{X^r_1} \right)^\theta + (1 - \mu^H) \left( \frac{X^L_2}{X_1} \right)^\theta \right]^{\frac{1}{\theta}}$$

is a CES aggregator of ex-post export prices.
- Again, with log preferences,

$$X_i = \frac{Y_i}{2},$$

i.e. the same as with perfect information.
The Value of $\theta$.

- Here: Argmington (intra-temporal);
- But the key economics is wrt Risk!
- Example outlined above shows that the value of $\theta$ matters.

Information frictions the opposite of trade costs?

- **Not True!** In their simulations, utility is higher with better information.
- Same in the stylized example above.
- More below (on efficiency benchmark)
International vs. Domestic Trade:

- Yet, they do not have domestic trade in the model!!!

- Information aggregation & domestic prices never had a chance!!

- Paper is motivated by information frictions that preclude international trade but not domestic trade.

- Introducing non-tradeables can enrich (or revert?) the implications of information imperfections.
Second order beliefs:

- Here: Knowing more of what the others know reduces trade.
- But in many other settings the opposite is true!
- In general, thinking of higher order beliefs might be useful.
- Potentially interesting interaction with multicountry settings.
Comments

- **Efficiency:**
  - More trade is not necessarily good
    - (remember old "creation" vs "diversion" stuff).
  - Here is also true in their simulations.
  - A clear benchmarks is desirable.

- **Going beyond Endowment Economies:**
  - Here, information only changes final consumption.
  - With production can change allocation of labor and other factors.
Comments

▶ **Real Exchange Risk?**
  ▶ Here Terms-of-Trade risk only.
  ▶ Most countries exports are determined in US$.
  ▶ A big chunk of risk is with domestic prices.
  ▶ Yet another reason to address the target issues in model with non-tradeables.

▶ **Financial Markets:**
  ▶ Here: no asset trading to avoid obscuring the argument.
  ▶ Can envisage settings in which asset prices lead to full revelation.
  ▶ The devil is on the details (but so are the interesting issues here)..
Comments

- How and how far are you going to push this?
  - Here: as a negative result and very forcefully.
  - Multiple dead-ends with the data.
My Takeaways

- Interesting stuff.
- Paper provides a productive provocation on how to think about information and trade.
- Introducing second order beliefs (information) and trade.