

The Margins of Trade

Eaton and Fielor (2022)

Discussion by Ricardo Reyes-Heroles

Federal Reserve Board

Banxico–Dallas Fed–UofH

Conference in International Economics

October 1, 2022

The views expressed in this presentation are those of the authors and do not necessarily reflect the position of the Federal Reserve Board or the Federal Reserve System.

Overview 1/3

- **What?** Develop a GE framework consistent with observed regularities in the margins of trade:
 - Margins: Quantity, Prices, and Extensive
Intensive

Overview 1/3

- **What?** Develop a GE framework consistent with observed regularities in the margins of trade:
 - Margins: Quantity, Prices, and Extensive
Intensive
- **Why?** Recent quantitative models of trade \Rightarrow understand bilateral trade flows and welfare. However, **QGE models cannot speak to multiple regularities in data in terms of margins of trade.**
 - Welfare changes? Key margins? Growth?

Overview 1/3

- **What?** Develop a GE framework consistent with observed regularities in the margins of trade:
 - Margins: Quantity, Prices, and Extensive
Intensive
- **Why?** Recent quantitative models of trade \Rightarrow understand bilateral trade flows and welfare. However, **QGE models cannot speak to multiple regularities in data in terms of margins of trade.**
 - Welfare changes? Key margins? Growth?
- **How?**

1. Provide set of empirical regularities by decomposing:

$$X_{ni} = \underbrace{E_{ni}}_{\text{extensive margin}} \times \left(\underbrace{D_{ni}}_{\text{quantity}} \times \underbrace{P_{ni}}_{\text{price}} \right)$$

2. Associate quality with unit values and incorporate into workhorse GE model of trade [EKK(2011)]:
- **Horizontal quality** ($Q(\omega)$): all users value greater horizontal quality equally
 - **Vertical quality** ($q(\omega)$): buyer using more values more (complements quantity)

- **What has been done?** Two lines of research:

1. Quantitative GE model of trade:

- Anderson and Van Wincoop (2003); Eaton and Kortum (2002); [Melitz(2003)] Chaney (2008); Eaton, Kortum and Kramarz (2011); Arkolakis, Costinot and Rodriguez-Clare (2012)

2. Margins of trade:

- Schott (2004); Hummels and Klenow (2005); Hallak (2006)
- Horizontal Q: Khandelwal (2010), Hallak and Schott (2011), ... → price of suppliers (exporters) focus of quantitative work
- Vertical q: Flam and Helpman (1987); Fajgelbaum, Grossman and Helpman (2011); *Feenstra and Romalis (2014)*, ... → price of buyers (importers) focus of quantitative work

Overview 3/3

- **How is this paper different?**

1. Model captures key regularity:
 - Rich countries pay more and charge more for the same product (unit values increase with exporter/importer GDP per capita)
2. Still delivers a homothetic gravity equation in which trade volume does not increase with income similarity (another empirical regularity) [ACR(2012)]
3. Tight estimation of the model

- **How is this paper different?**

1. Model captures key regularity:
 - Rich countries pay more and charge more for the same product (unit values increase with exporter/importer GDP per capita)
2. Still delivers a homothetic gravity equation in which trade volume does not increase with income similarity (another empirical regularity) [ACR(2012)]
3. Tight estimation of the model

→ **Very nice paper! Great contribution and crystal clear.
Opens path for many questions related modeling
the implications of different trade margins.**

Empirical Regularities

1. Gravity and its margins
2. **Price relationships**
3. Extensive margin

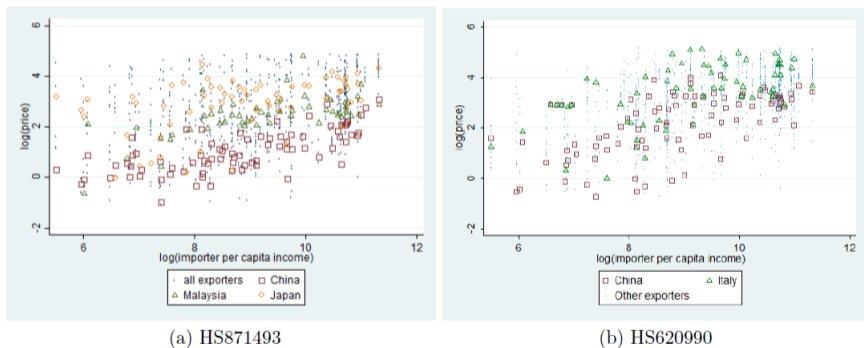


Figure 1: Examples of Products

The Model

Demand

- N countries: destination n and source i
- Monopolistic competition + heterogeneous firms: endogenous measure of varieties [EKK(2011)]
- **Demand:** Y for consumption and as intermediates

$$Y = \left[\int_{\omega \in \Omega} u(\omega)^\beta d\omega \right]^{1/\beta} \quad (1)$$

$$u(\omega) = [(\mathcal{Q}(\omega)y(\omega))^\rho + q(\omega)^\rho]^{1/\rho}, \quad \rho < 0$$

- Buyer takes as given prices and $\mathcal{Q}(\omega)$ and $q(\omega)$ to maximize (1) s.t.

$$\int_{\omega \in \Omega} p(\omega)y(\omega)d\omega \leq x$$

The Model

Demand

- N countries: destination n and source i
- Monopolistic competition + heterogeneous firms: endogenous measure of varieties [EKK(2011)]
- **Demand:** Y for consumption and as intermediates

$$Y = \left[\int_{\omega \in \Omega} u(\omega)^\beta d\omega \right]^{1/\beta} \quad (1)$$

$$u(\omega) = [(\mathcal{Q}(\omega)y(\omega))^\rho + q(\omega)^\rho]^{1/\rho}, \quad \rho < 0$$

- Buyer takes as given prices and $\mathcal{Q}(\omega)$ and $q(\omega)$ to maximize (1) s.t.

$$\int_{\omega \in \Omega} p(\omega)y(\omega)d\omega \leq x$$

- **C1:** It was not easy to come with simple examples, none in the paper.

Specific example...

- HS6 220890 – Spirits, liqueurs and other spirituous beverages → Agave distillates

Specific example...

- HS6 220890 – Spirits, liqueurs and other spirituous beverages → Agave distillates



Specific example...

- HS6 220890 – Spirits, liqueurs and other spirituous beverages → Agave distillates



Horizontal quality Δ 's



Specific example...

- HS6 220890 – Spirits, liqueurs and other spirituous beverages → Agave distillates



The Model

Technology

- CRS: One worker at ω with $m(\omega)$ of Y can produce $y(\omega)$, with $q(\omega)$ and $Q(\omega)$ according to:

$$y(\omega) = z(\omega)q(\omega)^{-\gamma}m(\omega)^{1-\alpha}$$
$$Q(\omega) = z(\omega)^\eta m(\omega)^\nu$$

- Solve by first choosing p, q, y given Q , then minimize cost and choose $Q(\omega) \rightarrow$ useful equation for intuition:

$$Q = \left(\frac{1 - \tilde{\alpha} wV}{\tilde{\alpha} \Gamma_3} \right)^{\nu/(1+\gamma)} z^\eta$$

- ▶ Higher w (richer country) or cheaper price index V^{-1} leads producer to substitute material for labor, raising Q .

The Model

Technology

- CRS: One worker at ω with $m(\omega)$ of Y can produce $y(\omega)$, with $q(\omega)$ and $Q(\omega)$ according to:

$$y(\omega) = z(\omega)q(\omega)^{-\gamma}m(\omega)^{1-\alpha}$$
$$Q(\omega) = z(\omega)^\eta m(\omega)^\nu$$

- Solve by first choosing p, q, y given Q , then minimize cost and choose $Q(\omega) \rightarrow$ useful equation for intuition:

$$Q = \left(\frac{1 - \tilde{\alpha}}{\tilde{\alpha}} \frac{wV}{\Gamma_3} \right)^{\nu/(1+\gamma)} z^\eta$$

- ▶ Higher w (richer country) or cheaper price index V^{-1} leads producer to substitute material for labor, raising Q .
- **C2:** Additional details on the relevance of each parameters would be helpful for reader.

The Model

Bilateral Price

$$p_{ni}(\epsilon, x) = \Gamma_8 \underbrace{\left(d_{ni} w_i^{\tilde{\alpha}} V_i^{-(1-\tilde{\alpha})} \right)}_{\text{cost}} \underbrace{\left(d_{ni} w_i^{\tilde{\alpha}} V_i^{-(1-\tilde{\alpha})} \right)^{\tilde{\eta}-1} \left[\left(\frac{f_n}{X_n} \right)^{\bar{m}-1} V_n \right]^{\tilde{\eta}-1}}_{\text{selection}}$$
$$\underbrace{(w_i V_i)^{\nu(1-\tilde{\gamma})}}_{\text{horizontal quality}} \underbrace{\left(\frac{f_n}{X_n} \right)^{\tilde{\gamma}\bar{m}}}_{\text{competition}} \underbrace{(x V_n)^{\tilde{\gamma}}}_{\text{non-homothetic demand}} \epsilon^{\tilde{\eta}-1+\tilde{\gamma}\bar{m}/(\bar{m}-1)}$$

Welfare and Growth

Questions / Food for Thought

- Why restrict ourselves to ACR? A1-A3 in real world? [RH(2017), DCPRHT(2022)]
- Extensive margin and growth → Kehoe and Ruhl (2013): policy and structural change

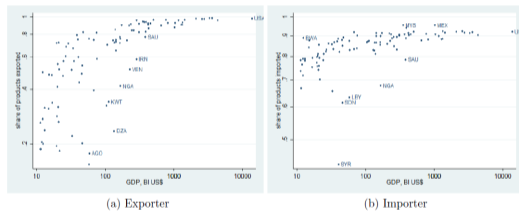


Figure 2: Extensive Margin and GDP

Thank you!