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Trade And Competitiveness: Rethinking Ricardian Comparative Advantage In Europe

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Motivation

- **Traditional Ricardian model**: A country has a Ricardian comparative advantage in an industry if in the country the **unit labor requirement** of that industry relative to the other industry is lower than in the other country.

- **Two main challenges to this "revelation principle":**

1) Labor is not the only input and relative factor intensities vary across sectors.

2) Theory of international trade with imperfect competition and firm heterogeneity following Melitz (2003), highlights the distinction between exogenous and endogenous Ricardian comparative advantage.

- **"Framework on hand":** Huang and Ottaviano (2024) introduce imperfect competition with endogenous markups and firm heterogeneity for correctly measuring Ricardian comparative advantage using Chinese micro and macro data.

Motivation

- **Context**: The EU operates under a free trade framework, acting as a live laboratory for the exploration of Ricardian Comparative Advantage : A unique amalgamation of both advanced and emerging economies, making it an unparalleled platform for analyzing the dynamics of trade.

- **Trade Significance**: Accounting for more than 40% of its GDP, the EU stands as a pivotal entity in the realm of global economic activities, underscoring its significance in trade.

- **Policy Relevance**: A deeper comprehension of Ricardian Comparative Advantage within the EU context is crucial for shaping policies that maximize trade benefits for its member states.

- **Objective**: This study aims to reassess Ricardian Comparative Advantage (RCA) within the diverse economic landscape of the EU.

Introduction

- **Focus on Sufficient Statistics:** Provides a sufficient statistics approach based on Huang and Ottaviano's CEPR working paper to analyze comparative advantage without relying on micro-level data.
- **Understanding Micro Structures:** Emphasizes the importance of comprehending the underlying microeconomic structures despite using macro-level data.
- **Combine CompNet Data and MDI Data:** The research leverages CompNet's database, which is structured around macro information but also informed by underlying microeconomic dynamics from (country-firm-level) MDI.
- **Innovative Use of Available Data:** Highlights how CompNet's macro-level information is meticulously constructed to reflect microeconomic foundations.

Literature Review:

Firm Heterogeneity and Comparative Advantage

1. **Bernard et al. (2007):** Explores the impact of trade liberalization on economies, integrating firm dynamics into the model of comparative advantage, which reveals complex job turnover dynamics across industries.

2. **Okubo (2009):** Extends the heterogeneous-firm trade model within the Ricardian framework, showing how trade patterns are consistent with Ricardian comparative advantage and how trade liberalization impacts economies differently based on size.

3. **Gaubert and Itskhoki (2021):** Focuses on the significant role of large firms in international trade patterns, utilizing a granular model to demonstrate how firm dynamics contribute to variations in export intensity and comparative advantage reversals.

4. **Huang and Ottaviano (2024):** Challenges the adequacy of the Balassa index for identifying Ricardian Comparative Advantage (RCA), advocating for **a structural approach that incorporates firm and product selection.**

Main Mechanism

Proposition 7. ***(Sufficient Statistics for Ricardian Comparative Advantage)*** *(a) The Pareto shape k, trade freeness ρ, export propensity $\chi(z)$ and intensity $\theta(z)$ are sufficient statistics for the ex-post amplifying component ($XPA(z)$) and dampening component ($XPD(z)$) of industry z's relative TFPQ.*

(b) The sufficient statistics for the ex-ante component further include $\omega(z)/\omega^*(z)$, the relative unit input prices, as this component can be rewritten as

$$\frac{\overline{\Phi}^A(z)}{\overline{\Phi}^{A*}(z)} = \left(\frac{C_M^*(z)}{C_M(z)}\right)^{\frac{k}{k+1}} \left(\frac{1-\theta(z)}{\theta(z)}\right)^{\frac{1}{k+1}} \chi(z)^{\frac{1}{k}} \rho^{-\frac{1}{k(k+1)}}, \tag{24}$$

Corollary 1. ***(Sufficient Statistics Using Macro Data)*** *(a) Trade elasticity k, trade freeness ρ, export intensity $\theta(z)$ and relative market size L/L^* are sufficient statistics for the ex-post components of Home industry z's relative TFPQ.*

(b) The sufficient statistics for the ex-ante component further include relative unit input prices $\omega(z)/\omega^*(z)$ as this component can be equivalently rewritten as

$$\frac{\overline{\Phi}^A(z)}{\overline{\Phi}^{A*}(z)} = \frac{\omega(z)}{\omega^*(z)} \left[\rho\left(1-\theta(z)\right) + \rho^{-1}\theta(z)\right]^{\frac{1}{k+1}} \left(\frac{L}{L^*}\right)^{\frac{1}{k+1}}. \tag{26}$$

Three Stylized Facts To Support The Model

- **Fact 1:** Industries' export propensity and export intensity rise with labor/capital intensity and productivity. (CompNet and MDI)

  Export Propensity: The ratio of the number of exporters to the total number of firms
  Export Intensity: The ratio of total exports to total sales

Lemma 2. ***(Export Propensity and Intensity)*** *Home export propensity* $\chi(z)$ *increases with* z *if and only if Home export intensity* $\theta(z)$ *increases with* z *for* $z \in [0,1]$*:*

$$\frac{\partial \theta(z)}{\partial z} \geq 0 \Leftrightarrow \frac{\partial \chi(z)}{\partial z} \geq 0.$$

- **Fact 2:** Firms' export product scope increases with industry labor/capital intensity and productivity. (MDI)

- **Fact 3:** The skewness of firms' export product mix decreases with industry labor/capital intensity and productivity. (MDI)

Fact 1. Export Propensity Rises With CI

Export Propensity	(1) Solow Residuals	(2) Labor Productivity	(3) Capital Productivity	(4) TFP 0	(5) TFP 1	(6) TFP 2	(7) TFP 3	(8) TFP 4
Capital Intensity	0.1096***	0.0268	0.1144***	0.0749**	0.0597***	0.0579**	0.0753**	0.0798**
	(0.0153)	(0.0203)	(0.0269)	(0.0276)	(0.0191)	(0.0197)	(0.0331)	(0.0359)
Productivity	0.2615***	10.9342***	4.4144***	-0.5150	27.1868***	21.7979***	-17.6832***	14.2168**
	(0.0380)	(1.0925)	(1.2086)	(3.1017)	(5.5399)	(5.6429)	(3.0383)	(5.0413)
Observations	2,154	2,154	2,154	2,154	2,044	2,145	1,742	1,899
Adjusted R-squared	0.8770	0.8826	0.8725	0.8700	0.8722	0.8751	0.8781	0.8617
Country-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Fact 1. Export Intensity Rises With CI

Export Intensity	(1) Solow Residuals	(2) Labor Productivity	(3) Capital Productivity	(4) TFP 0	(5) TFP 1	(6) TFP 2	(7) TFP 3	(8) TFP 4
Capital Intensity	0.2610**	0.1356**	0.2638***	0.1851**	0.1944***	0.2015**	0.2304**	0.2098**
	(0.1097)	(0.0570)	(0.0847)	(0.0615)	(0.0616)	(0.0651)	(0.0760)	(0.0805)
Productivity	0.5283	12.4908	8.1490	6.4391	-1.4796	-15.2465	19.9263	13.3621
	(0.5454)	(8.3600)	(4.9264)	(27.1114)	(35.0055)	(33.7176)	(47.2221)	(56.0710)
Observations	2,153	2,153	2,153	2,153	2,043	2,144	1,741	1,898
Adjusted R-squared	0.5775	0.5773	0.5772	0.5771	0.5765	0.5772	0.5747	0.5750
Country-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Fact 1. Export Propensity Rises With Productivity

Export Propensity	(1) Solow Residuals	(2) Labor Productivity	(3) Capital Productivity	(4) TFP 0	(5) TFP 1	(6) TFP 2	(7) TFP 3	(8) TFP 4
Labor Intensity	-0.3153	-0.0632	-0.3025	-0.3631	-0.2389	-0.2324	-0.3005	-0.3032
	(0.3706)	(0.2856)	(0.3827)	(0.3842)	(0.3128)	(0.3234)	(0.3685)	(0.3576)
Productivity	0.2124***	11.2894***	2.0486	-0.1189	28.2445***	23.0063***	-19.6060***	15.7499**
	(0.0468)	(0.9607)	(1.1761)	(3.1452)	(5.6220)	(5.6395)	(3.3414)	(5.1278)
Observations	2,154	2,154	2,154	2,154	2,044	2,145	1,742	1,899
Adjusted R-squared	0.8731	0.8823	0.8688	0.8681	0.8710	0.8739	0.8761	0.8595
Country-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Fact 1. Export Intensity Decreases With LI

Export Intensity	(1) Solow Residuals	(2) Labor Productivity	(3) Capital Productivity	(4) TFP 0	(5) TFP 1	(6) TFP 2	(7) TFP 3	(8) TFP 4
Labor Intensity	-4.1212***	-3.8604**	-4.1553***	-4.1622***	-4.5957***	-4.3317***	-4.4273***	-4.5532***
	(1.2484)	(1.3848)	(1.2267)	(1.2748)	(1.2710)	(1.1641)	(1.2372)	(1.1400)
Productivity	0.4024	13.2047	1.8829	6.7486	-0.3432	-13.1879	14.4604	15.4412
	(0.4603)	(8.4375)	(3.9252)	(27.5434)	(34.2711)	(33.0320)	(45.1951)	(54.7727)
Observations	2,153	2,153	2,153	2,153	2,043	2,144	1,741	1,898
Adjusted R-squared	0.5774	0.5775	0.5772	0.5772	0.5767	0.5774	0.5748	0.5752
Country-Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

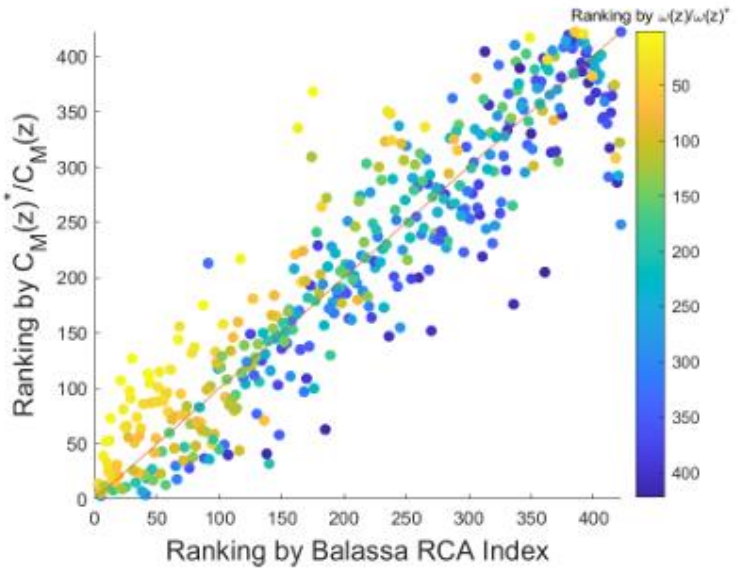
Expected Findings

1. **Insights:** A deeper understanding of how comparative advantage shapes international trade within the EU:

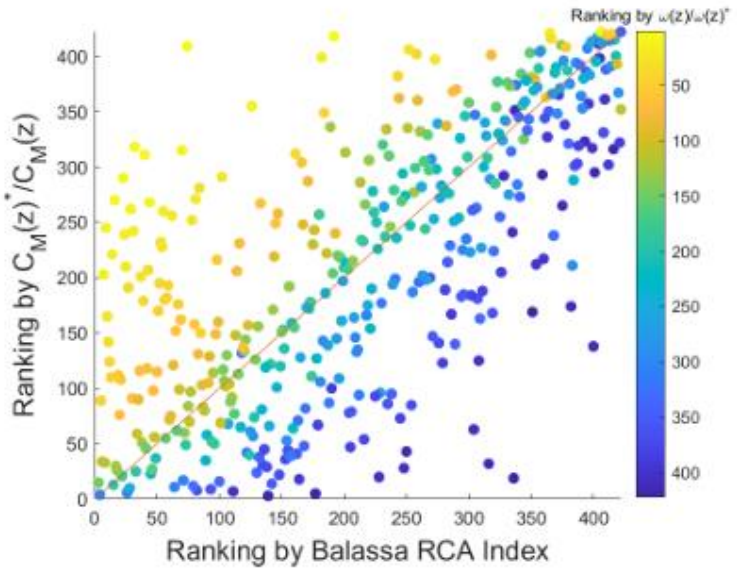
1) Differences with traditional RCA on sector level.

2) Observe sector-specific parameters ρ(z) and k(z) to develop formula (26).

(a) baseline Pareto shape ($k = 1.31$)



(b) larger Pareto shape ($k = 6.55$)



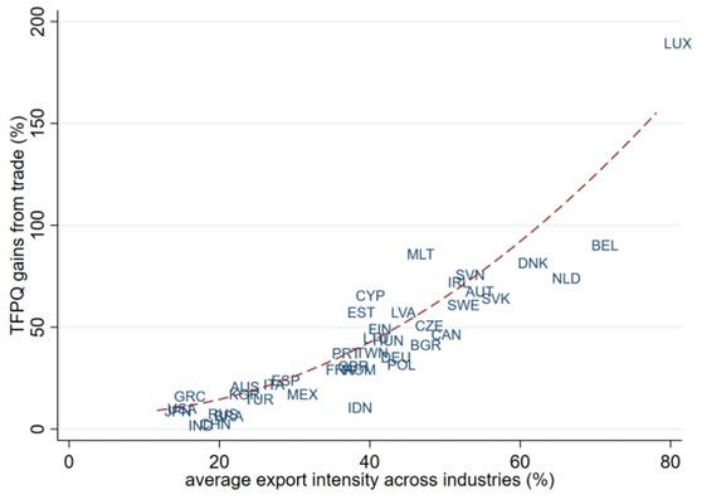
Expected Findings

2. Contribution: A comprehensive analysis of RCA within the EU, contributing to theoretical and practical trade discussions.

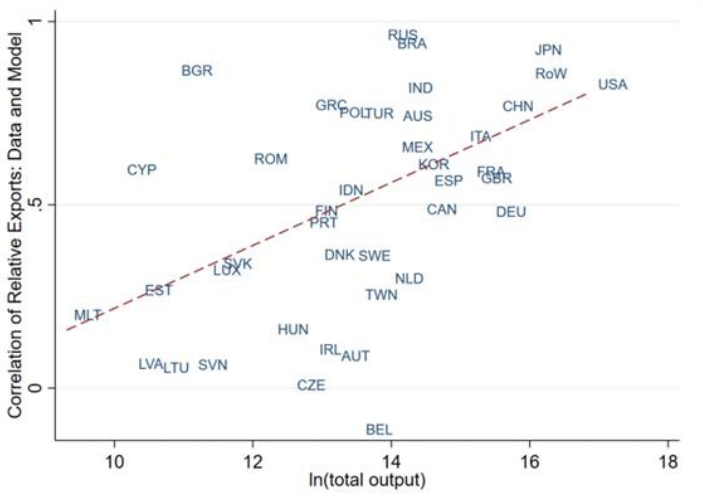
3. Policy Implications: Explores the cooperative spirit of European integration and its relevance in global trade tensions.

Figure 5: Macrodata Results

(a) Relative Productivity Gains from Trade



(b) Relative Export and Total Output



Future Work And Summary

- Upcoming Presentation: the CompNet Annual Conference in Malta, June 20-21, 2024.
- Use MDI data to empirically examine **and validate the second and third stylized facts. Additionally, employ this data set to derive insights from firm-level TFP estimations as highlighted in the first fact**. Utilize MDI's comprehensive coverage to deepen our understanding of RCA within the EU with heterogeneity.
- In Huang and Ottaviano (2024), they highlight the potential of using macro-level data as a proxy for firm-level statistics in the analysis of comparative advantage.
- CompNet and MDI data could be instrumental in assessing whether EU countries' data are consistent with the predictions of the Heckscher-Ohlin (HO) model, in particular regarding the variable elasticity of substitution (VES) and variable markups. This could pave the way for a better understanding of comparative advantages within the EU.

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Thank you for your attention!