Discussing: Trade Models, Trade Elasticities, and the Gains from Trade, by Ina Simonovska and Michael Waugh

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Acknowledgement and Disclaimer

The results and opinions presented here do not necessarily represent the views of the World Bank, their Executive Directors, or the countries they represent

Charles Blackorby and Robert Russell (AER, 1989)

- *"Will the Real Elasticity of Substitution Please Stand Up?"*

Backdrop

- Theory based trade elasticities:
  - ACR (AER, 2012): One trade elasticity is sufficient for inferring welfare gains from trade for all countries
  - Caliendo and Parro (ReStud, 2015): Input-output linkages matters in evaluating welfare gains from trade (sectoral trade elasticities)
  - Ossa (JIE, 2015): Accounting for cross-industry variation in trade elasticities greatly magnifies the estimated gains from trade
  - Simonskova and Waugh (2014): EK based estimate for trade elasticities is 4
- Empirical based elasticities:
  - Kohli (1991): Estimate import demand elasticities at the aggregate level
  - Harrigan (AER, 1997) Estimate export supply elasticities at industry level
  - Broda and Weisntein (QJE, 2006): Estimate 30,000 elasticities of substitutions at 10-digit HTS level for the US
  - Kee, Nicita and Olarreaga (ReStat, 2008): Translog GDP-function approach in estimating 377,000 import demand elasticities for 117 countries for 4900 HS 6-digit products

More Recent Work

- Broda, Greenfield and Weinstein (2017): Elasticity estimates for 73 countries, 200 sectors
- Kee and Nicita (2024): Bilateral trade elasticities varying by importing countries, exporting countries and HS 6-digit products
- Espinosa (2025): Used protectionist and retaliatory tariffs as IVs to estimate trade elasticities, leading large welfare loss
- Alessandria et al (2025): Estimate short-run vs long run trade elasticities

Why Do We Care?

- Trade elasticity is not just a theoretical concept (CES preference, Frechet technology parameter), it has real world implications
- What is the impact of reciprocal tariffs?
- What is the short-run vs long-run effect of trade wars?
- What is the trade effects of NTMs?
- How to evaluate the impacts of a trade agreement?

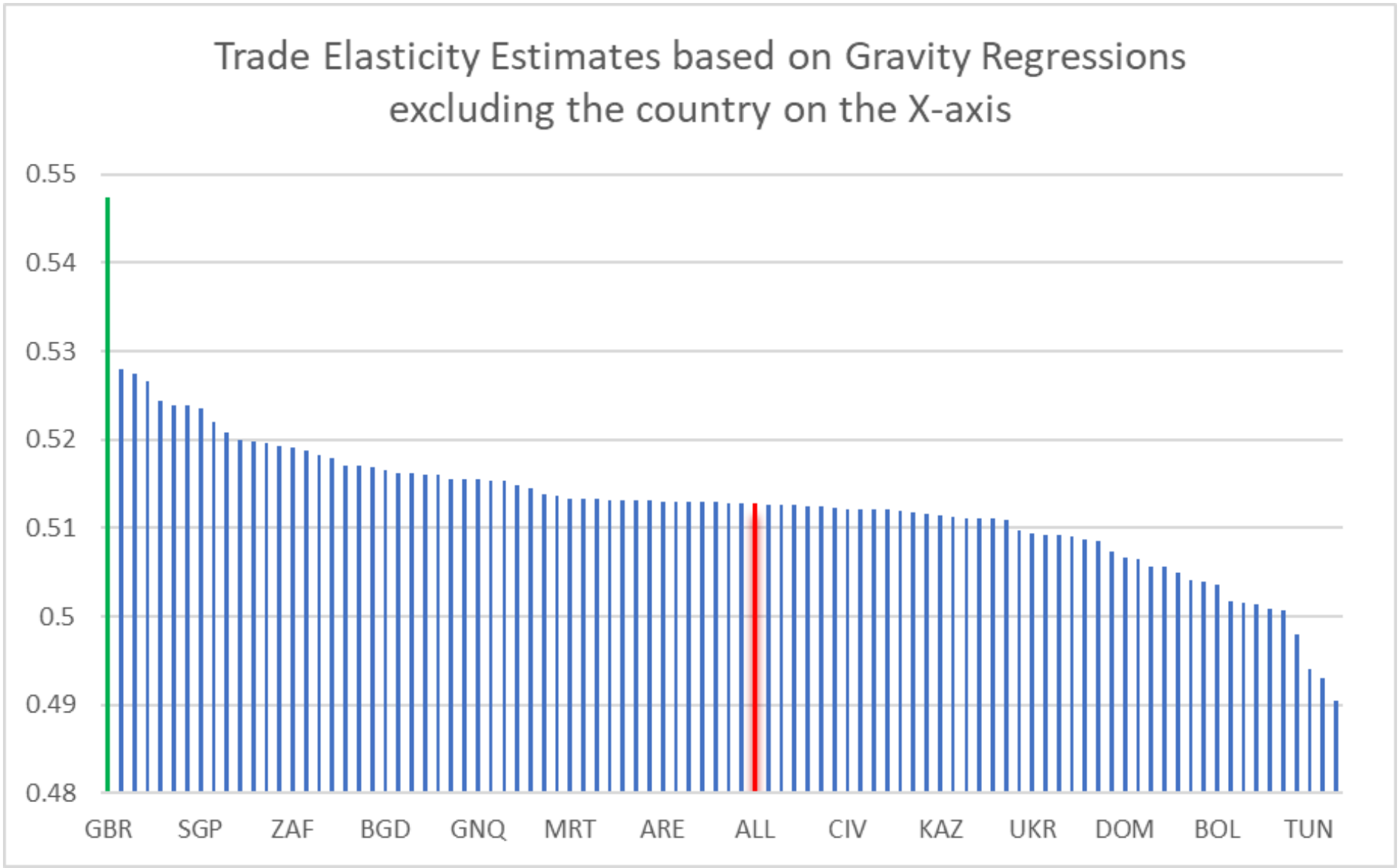
Contributions

- Different models may imply different price distributions, leading to different elasticities and welfare gains
- More detailed models with more margins may have smaller elasticities leading to larger welfare gains
- Cool methodology based on ordered statistics to estimate trade elasticities that is consistent with the models

Fruits for Thoughts

- Taking models literally (no specification errors), attribute all the differences in price distribution to trade elasticities, but many things affect prices (market power, exchange rate, substitutions, transfer pricing, GVCs, trade policies, etc.)
- Restrict the estimation only for products with bilateral trade (i.e. both importing and exporting)
- Estimate elasticities at different level of aggregation
- Possible to push the envelope to estimate elasticities with bilateral variations?

Trade Elasticities of Countries exporting to the EU



Bridging Model-based and Empirical Estimates

- Feenstra and Weinstein (JPE, 2017): Translog preferences $\Rightarrow$ import elasticity inversely related to market share
- Anderson and Neary (ReStud, 1996; IER, 2003), Feenstra (1995): TRI and MTRI, evaluation trade and welfare gains from trade based on uniform tariff equivalent and import demand elasticities

Bilateral-Elasticities

- Assuming translog GDP function with homogeneity and symmetry (Diewert and Wales, 1988) $\Rightarrow$ log linear share equations for each good with respective to relative prices and endowments

$$\begin{aligned} s_n^t\left(p^t, v^t\right) &\equiv \frac{p_n^t q_n^t\left(p^t, v^t\right)}{G^t\left(p^t, v^t\right)} = a_{0n}^t + \sum_{k=1}^{N} a_{nk}^t \ln p_k^t + \sum_{m=1}^{M} c_{nm}^t \ln v_m^t \\ &= a_{0n}^t + a_{nn}^t \ln p_n^t + \sum_{k \neq n} a_{nk}^t \ln p_k^t + \sum_{m=1}^{M} c_{nm}^t \ln v_m^t, \ \forall n = 1, \end{aligned}$$

- The bilateral elasticity of good n with respect to its own price is:

$$\begin{aligned} \varepsilon_{nnj}^t &\equiv \frac{\partial q_n^t\left(p^t, v^t\right)}{\partial \tilde{p}_{nj}^t} \frac{\tilde{p}_{nj}^t}{q_{nj}^t} \qquad (2) \\ &= \left(\frac{a_{nn}^t}{s_{nj}^t} + s_{nj}^t - 1\right) \leq 0, \ \forall s_n^t < 0. \qquad (3) \end{aligned}$$

Bilateral-TRI

- Bilateral-TRI can be decomposed into three terms:

$$\begin{aligned}
\text{TRI}_{cp} &= \left[\bar{t}_{cp}^2 + \sigma_{cp}^2 + \rho_{cp}\right]^{1/2}, \text{ with} && (4)\\
\bar{t}_{cp} &\equiv \sum_n s_{ncp} t_{ncp}, && (5)\\
\sigma_{cp}^2 &\equiv \sum_n s_{ncp} \left(t_{ncp} - \bar{t}_{cp}\right)^2, && (6)\\
\rho_{cp} &\equiv \sum_n s_{ncp} \left(t_{ncp} - \bar{t}_{cp}\right)\left(\varepsilon_{ncp} - \bar{\varepsilon}_{cp}\right), && (7)\\
\bar{\varepsilon}_{cp} &\equiv \sum_n s_{ncp}\varepsilon_{ncp} < 0 && (8)
\end{aligned}$$

- Bilateral-TRI will be higher if the bilateral trade policy of c on products from p has a higher average, $\bar{t}_{cp}$, a large variance, σ_{cp}^2, or a high correlation with the bilateral trade elasticity, ρ_{cp}.

Conclusions

- Good stuff: timely contribution for a really important issue
- Clear illustration on the various channels for welfare gains from trade
- Pushing the frontier to bridge theory-based and empirical-base elasticities

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"Will the Real Elasticity of Substitution Please Stand Up?"

Simonovska and Waugh (2025)

It depends on contexts ...