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Alternative methodologies to assess the growth effects of economic integration: CGE vs. gravity model *cum* Melitz

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Motivation

• Workshop: focus on finding a suitable methodology for analyzing effects of economic integration in Eurasia and beyond
• Ongoing controversy about possible effects of TTIP – due to new modelling approach by Gabriel Felbermayr and colleagues at ifo Institute (Munich)
• New approach raises several questions about whether the estimates are plausible, but …
• … predicts much larger, positive effects of integration
• … thereby vindicates trade economists‘ enthusiasm for economic integration
Possible effects of TTIP: Francois et al. vs. Felbermayr et al

<table>
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<th>Joseph Francois et al. (CEPR; European Commission)</th>
<th>Gabriel Felbermayr et al. (ifo; Bertelsmann, German Ministry of Economy)</th>
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</thead>
<tbody>
<tr>
<td>GDP: EU</td>
<td>+0.4 percent</td>
<td>D: +4.7 percent; UK: +9.4 percent</td>
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<tr>
<td>GDP: US</td>
<td>+0.5 percent</td>
<td>+13.4 percent</td>
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<tr>
<td>GDP: third countries</td>
<td>Small and mostly positive</td>
<td>Negative and large (Canada: -9.5 pc)</td>
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<td>Methodology</td>
<td>Multi-region, multi-sectoral CGE model</td>
<td>Gravity model: bilateral matrix of trade costs; lower trade costs imply welfare (=GDP) gains</td>
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<td>Non-tariff barriers, PTA effects</td>
<td>Expert estimates; essentially ad hoc</td>
<td>Econometric – Anderson &amp; Wincoop (2003)</td>
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<td>Labor market</td>
<td>Full employment</td>
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<td>Firm structure</td>
<td>Sector-wise</td>
<td>Melitz-style productivity differences b/w firms</td>
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Figure 2: Change in trade costs from TTIP

Source: Schematic representation by ifo Institut
• Which components of the non-tariff barriers can in fact be influenced by free-trade agreements?
  – “Actionability”: In the jungle of the most varied trade policy measures, which ones can be changed in which circumstances?
  – To what extent are NT barriers lowered by PTA?
• Estimate becomes largely ad-hoc.
• Alternative: estimate gravity model carefully.
Stylized gravity equation
(Anderson and van Wincoop, 2003)

• Trade costs for a given country pair depend on trade costs for all other country pairs.
• Multilateral resistance terms
  – $\prod_i$ – aggregate of trade costs faced by a „typical“ exporter
  – $P_j$ – aggregate trade costs faced by a „typical“ importer
• $\prod_i$ and $P_j$ depend on $d_{ij}$ and all GDPs
• BIP = GDP

$$\ln x_{ij} = -\ln BIP^W + \ln BIP_i + \ln BIP_j - \ln d_{ij} + \ln \prod_i + \ln P_j$$
PTA trade creation effect: 80 percent

- Instrumental variable estimates of gravity model:
  - matrix of trade costs between all country pairs
  - average effect of a free-trade zone on bilateral trade

- Average increase in aggregate bilateral trade through existing free-trade agreements (EU, NAFTA, ...): 80 pc

  Model covers third-country effects, as well as trade creation that result indirectly from a change in the GDPs of all countries.

- Felbermayr et al.: same effect assumed for TTIP

- Simulation: trade costs EU-US reduced such that trade expansion = 80 percent
• Gravity model: partial analytic multiplier connection between the change in bilateral trade and the change in all variable trade costs
  Multiplier = elasticity of trade
• Simple example:
  – Trade increases by 80 percent through PTA
  – Trade elasticity = 5 (from literature)
  – Trade costs must have fallen by 80% : 5 = 16%
  – Assume: Tariffs EU/ US = 3.5%
  – Then non-tariff barriers must fall by 16% – 3.5% = 12.5%.
TTIP scenarios

• Tariff elimination scenario vs.
• Comprehensive liberalization scenario: reduction of the NT barriers releases real resources that can be used for useful activities that result directly in welfare gains
• … regardless of how the NTBs are reduced:
  – mutual recognition of different standards
  – harmonization
  – elimination of discriminatory measures
Real income effects …

• … are derived from the price reductions that follow from lower trade costs.
• How much economies benefit depends on the trade structure of the individual countries, their size and their geographical position.
  
  Large export $\rightarrow$ high gains
Figure 8: Change in global real per capita income, deep liberalization

Source: ifo Institut
Further steps

• Labor market effects: search and matching model; unemployment tends to be reduced when income and trade effects positive.

• Firm structure = exporter/ non-exporter, etc.: shift of firms to exporter status can modelled (typically sectoral estimates) and help to explain aggregate growth of labour productivity.

• Do we „believe“ large positive real income effects for PTA members and large negative effects for some third countries? If not, what EXACTLY is wrong with this approach?