Kiel Institute
for the World Economy

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

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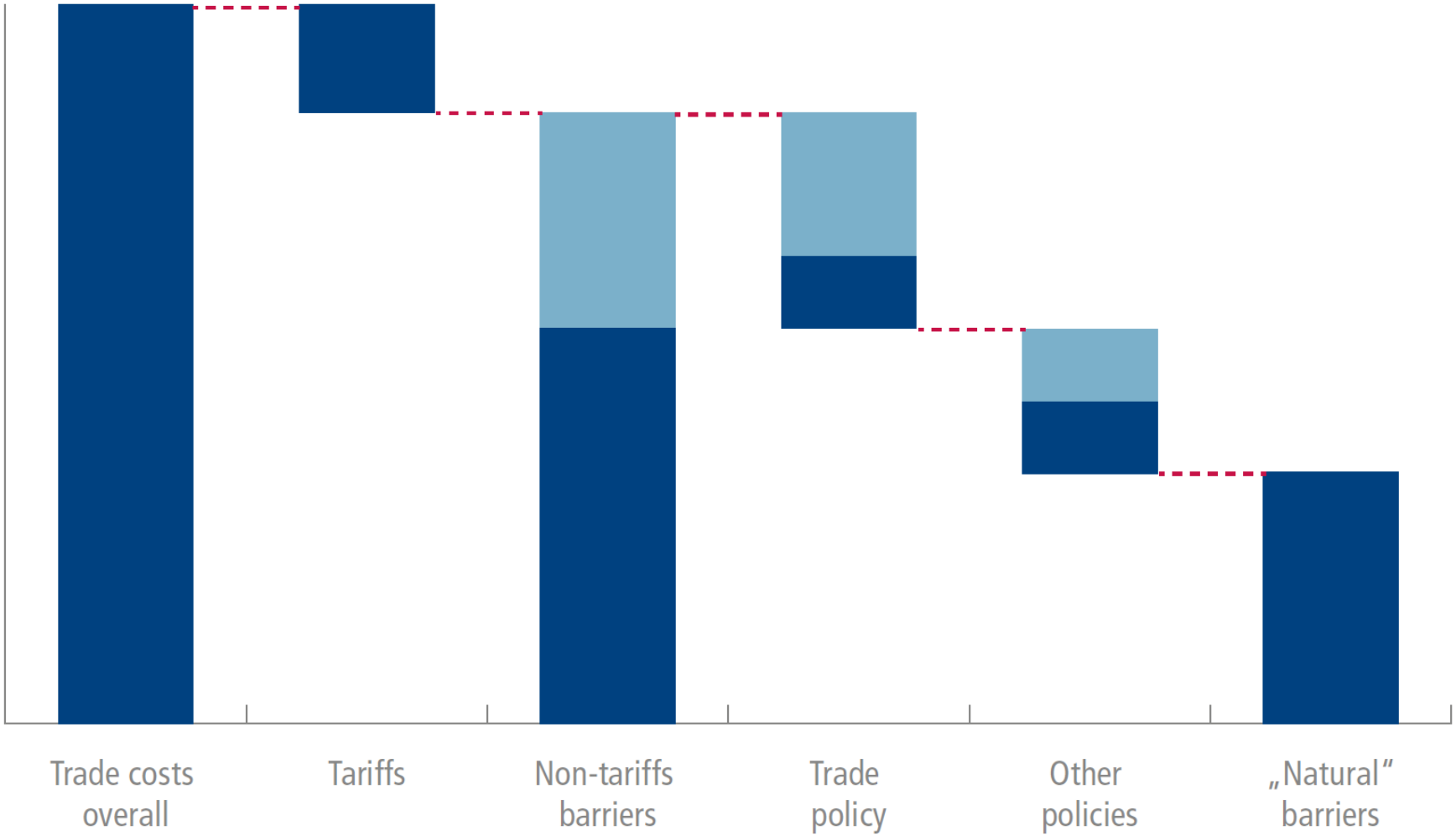
Motivation

- 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

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

Figure 2: Change in trade costs from TTIP



Source: Schematic representation by ifo Institut

Developing scenarios for NTB reduction … „expert aproach“ (typically used for CGE models)

- 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
  - ∏i – aggregate of trade costs faced by a „typical“ exporter
  - Pj – aggregate trade costs faced by a „typical“ importer
- ∏i and Pj depend on dij 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

Linkages: trade elasticit, trade creation, trade costs

- 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

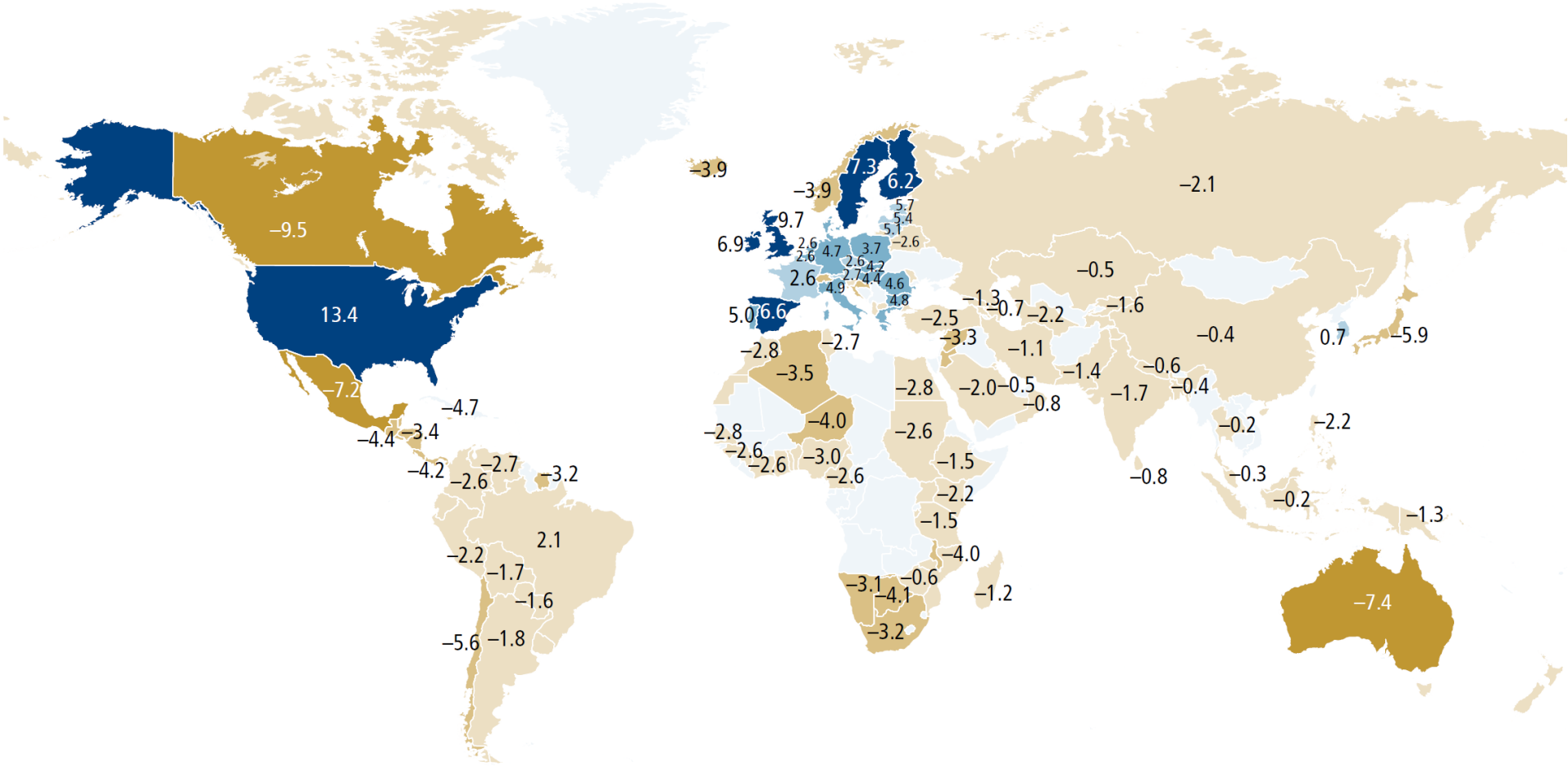
- Tariff elimination scenario vs.
- Comprehensive liberalization scenario: reduction of the NT barriers releases real resources that can be used for useful activities that result directly in welfare gains
- … regardless of how the NTBs are reduced:
  - mutual recognition of different standards
  - harmonization
  - 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 → high gains

Figure 8: Change in global real per capita income, deep liberalization



Source: ifo Institut

Further steps

- Labor market effects: seach 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?