

Global Value Chains: How do we measure their impacts?

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How do we measure “Global value chains”?

- Case studies (product level): iPod, Barbie doll, T-shirts, airplanes
- Firm level (e.g. Tim Sturgeon, Gereffi, etc.)
- Business function offshoring
- FDI and MNCs
- Trade in intermediates
- Input Output Tables
 - ESR Special issue 2013
 - (see diMauro, Plamper, Stehrer: ECB CompNet Policy Brief Nr 3)
 - WIOD, EORA, GTAP, EXIOPOL, IDE-JETRO, GIO (Asian focus)

Measures based on World Input-Output Tables

Indicators which are frequently used:

- Offshoring measures (e.g. Feenstra and Hanson, 1999)
- Domestic and foreign content of exports (or final production) and value added exports (HIY, 2001; Johnson and Noguera, 2012; Koopman et al., forthcoming, Stehrer, 2012, 2013)
- GVC approach (Timmer et al., forthcoming)
- Hubs and spokes indicators (Lejour et al., 2011)
- Upstreamness/Downstreamness (Distance to consumer, backward/forward linkages, etc.) (Antras; ...)

Technically concepts are related to concept of multiplier analysis (Leontief inverse)

$$\mathbf{x} = \mathbf{z} + \mathbf{f} = \mathbf{Ax} + \mathbf{f} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f} = \mathbf{Lf} \quad (1)$$

Pre-multiplied with vector including

- value added coefficients
 - NA identities
 - Global constraints
- employment coefficients
- energy, emissions, R&D, etc. coefficients

What cannot be measured by World Input-Output Tables?

- Global IO tables should - in principle – record all transactions of (cross-border) flows of goods and services
 - Conceptual issues, measurement errors, etc.
- Which international activities do not lead to such flows?
 - Business function offshoring
 - M&A, FDI, etc.
 - After attracting FDI, attract Business Functions ...

Challenges ahead:

“Just data problems”:

- More details on Services trade, BEC codes, ...
- Deflation and constant price tables, exchange rate movements
- Sectoral details (Classifications breaks, etc.)
- Timely updates (T12, T24, T36)
- Tariffs, NTMs, etc.

Conceptual issues:

- GDP vs GNP (additional data from AfA, FATS, etc.)
- Profit flows (finance flows)
- Quality aspects ...
- Etc.

How are impacts measured (using global IO tables)?

- Value added (factor income) growth
 - GVC participation has positive effects (Foster/Timmer/Stehrer, 2012)
- Factor demand (Employment by education and occupational categories)
 - Offshoring has no negative impacts on employment (Foster/Stehrer/deVries, 2013; Foster /Pöschl/Stehrer, 2013)
- Technology spillovers
 - Positive productivity effects of foreign R&D spillovers (Foster/Pöschl/Stehrer, 2013a, 2013b)
- Balance-of-payment
 - Bilateral differences, but no macro-economic implications (Stehrer, 2012, 2013)
- Change in RCA patterns
 - Yes, but only for selected countries and industries (Koopman et al., forthcoming)
- Energy and environmental impacts: ...

Usually:

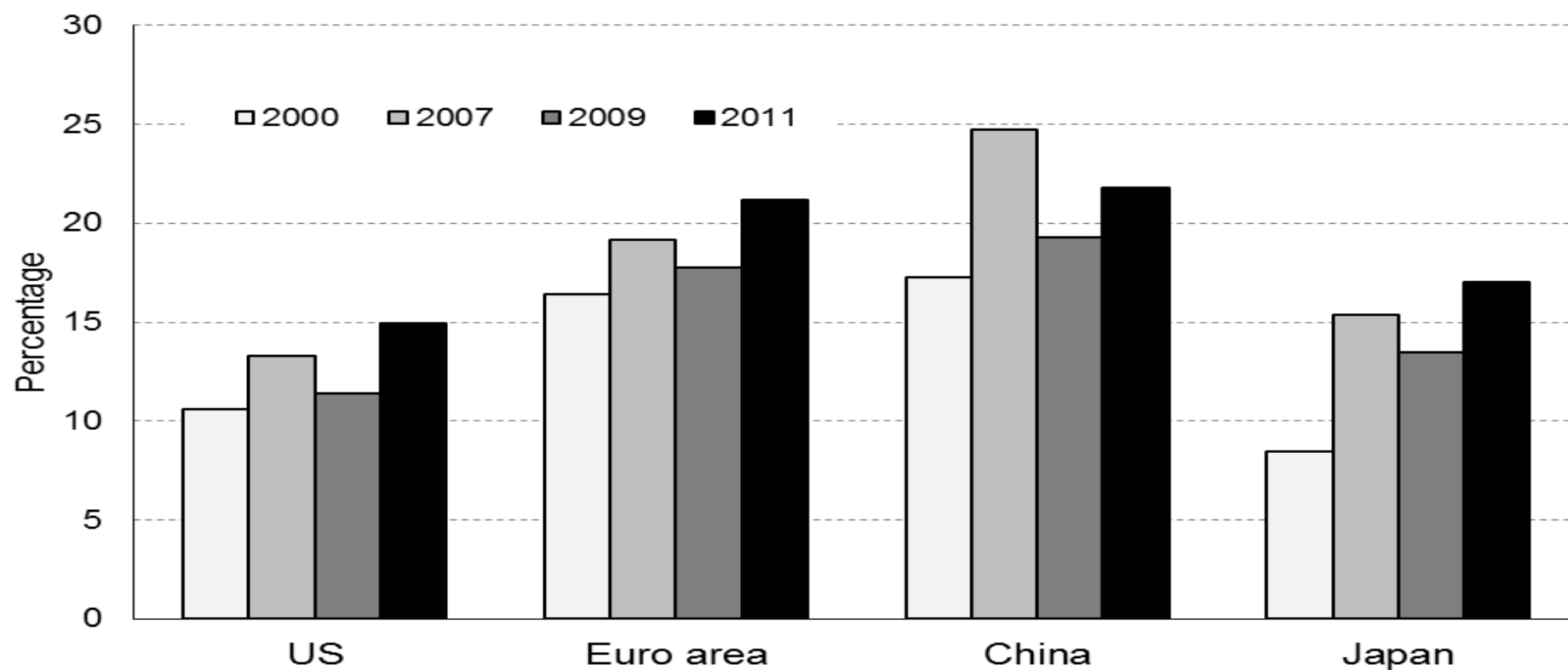
- Input-output techniques
- Regress a measure of GVCs on outcome variable (labour demand, growth, productivity growth, etc.)

Two examples:

- Value added trade in the euro area
- Differentiated employment impacts of offshoring

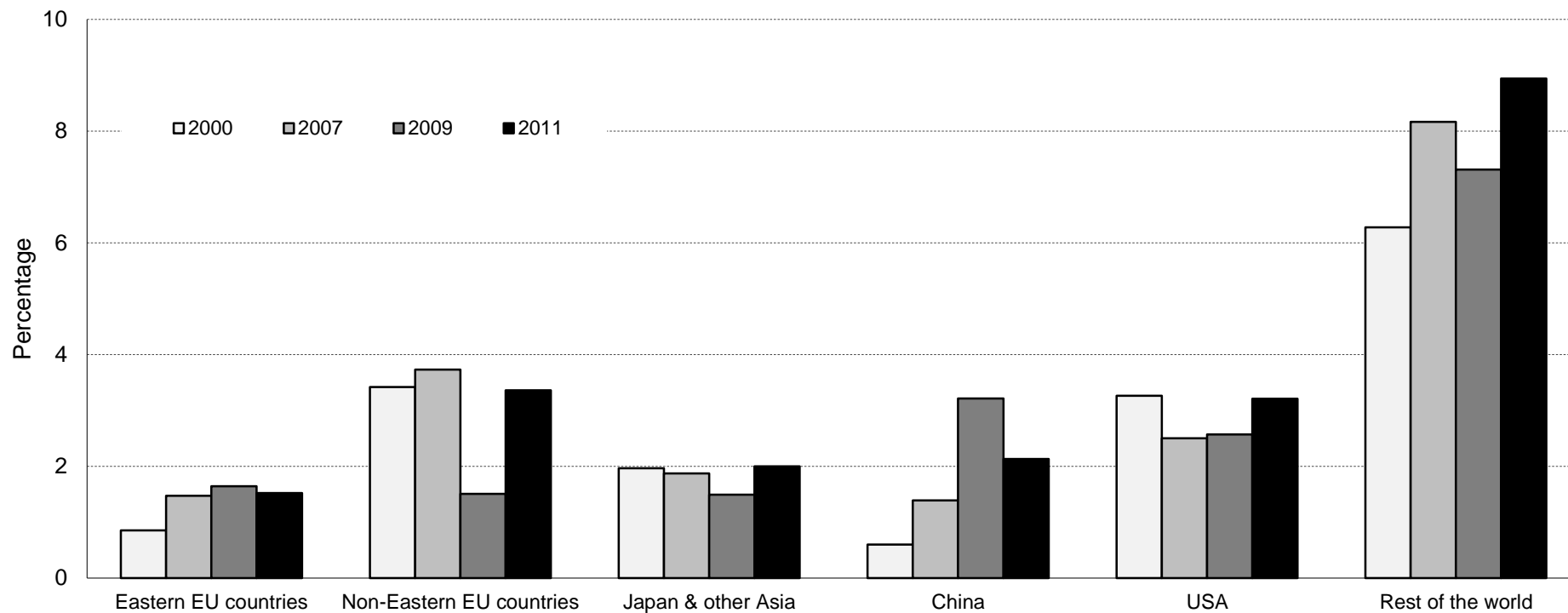
Value added in trade: A view from the Euro area

Euro area as a whole and members' extra-area trade: Indicators of value added in trade



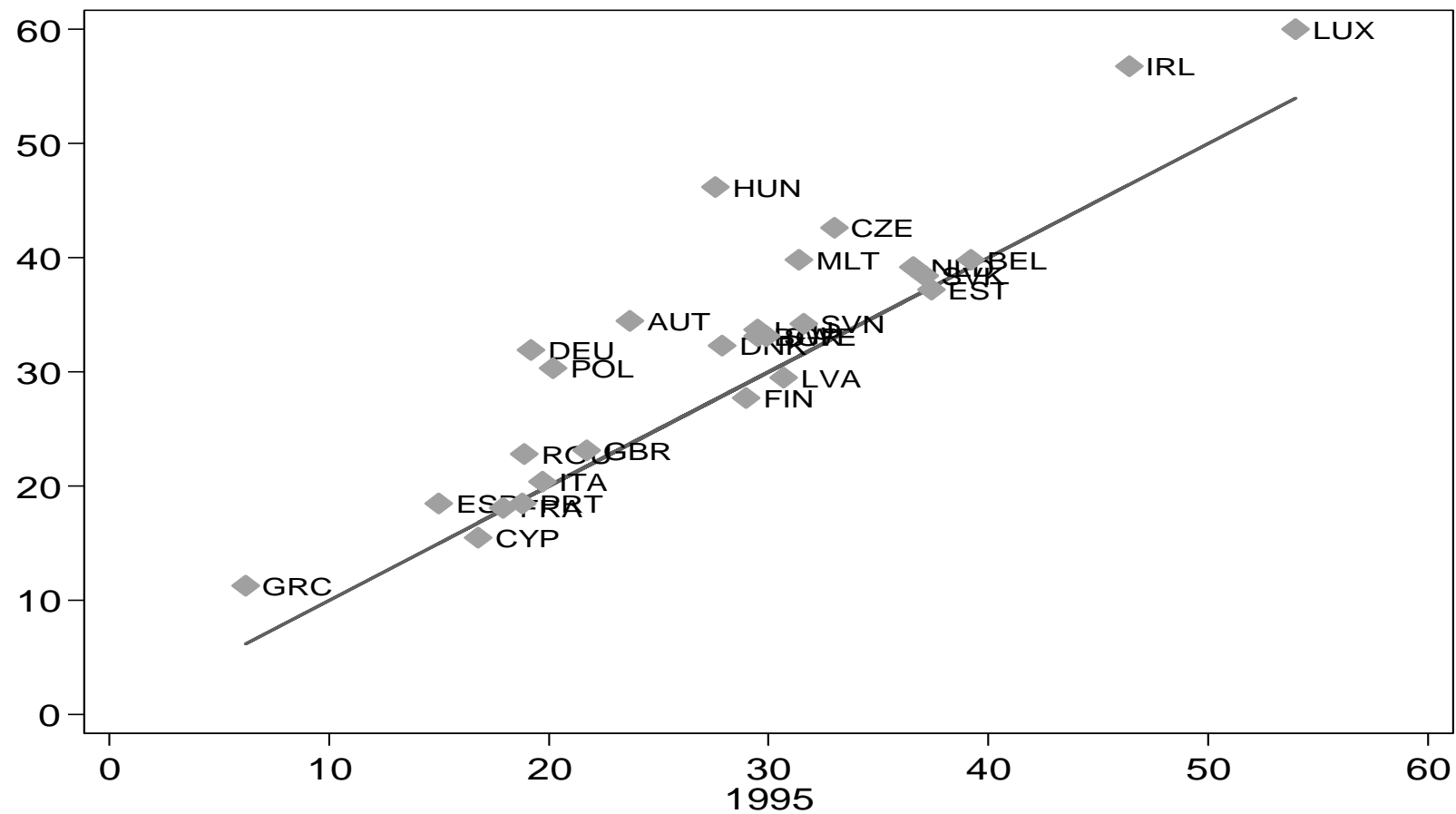
Source: Amador, Capariello and Stehrer, 2013

Euro area as whole: foreign value added in exports by origin (in % of exports)



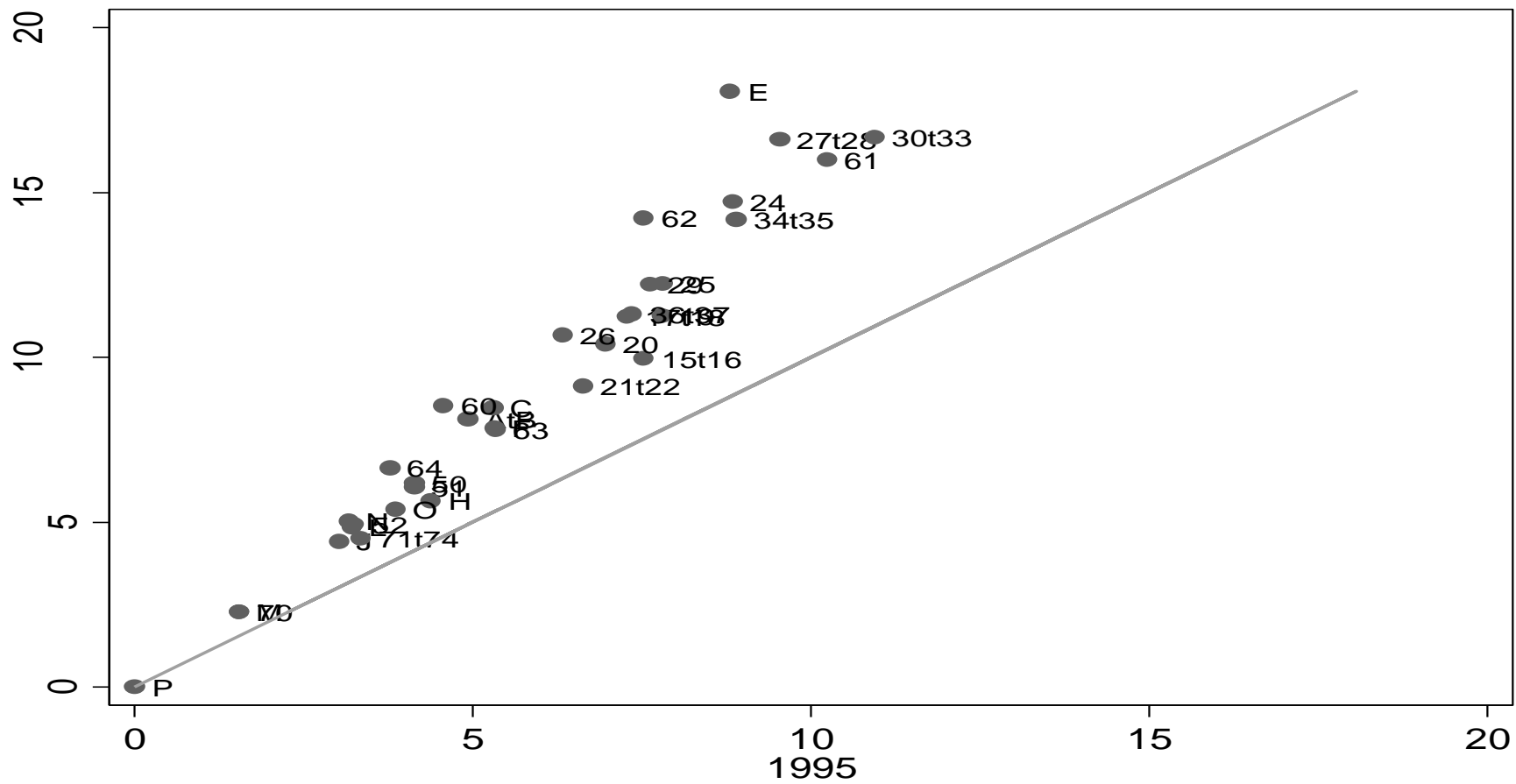
Source: Amador, Capariello and Stehrer, 2013

Value added due to foreign demand (in % of total GDP), 1995 and 2011



Source: Foster, Stehrer and Timmer (2012)

Foreign value added content in exports, 1995 and 2007



Source: Foster, Stehrer and Timmer (2012)

Offshoring and employment

(Foster, Pöschl, Stehrer, 2013)

- Productivity effect (output is produced with less domestic inputs)
- Scale effect: Offshoring makes firms/industries more productive

Regression approach: Developed countries

	Conditional labour demand				Unconditional labour demand			
	All	Low	Medium	High	All	Low	Medium	High
ΔIIM^B	-0.0628*** (0.0118)	-0.00593 (0.0165)	-0.0609*** (0.0135)	-0.0378** (0.0167)	0.0404*** (0.0133)	0.0911*** (0.0176)	0.0364** (0.0147)	0.0609*** (0.0188)