

# Statistics on a from-whom-to-whom basis

Networks, GVCs and firm-level data



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## Outline

- I. Tools to look at from-whom-to-whom data**
- II. Another example: whom-to-whom in GVCs**
- III. The importance of comparable cross-country firm-level data**



**Whom-to-whom data provides rich insights and the set of tools for analysis includes:**

**Visualization techniques (nodes and edges)**

- Directed/undirected and weighted/binary networks

**Network theory to identify topological properties**

- Node-level and network-level metrics
- Degrees, centralization, assortativity, clustering
- Comparison with reference models of network formation



## **Whom-to-whom data is classic in international trade:**

- Representation of the World Trade Web as a network

**GVCs are a new paradigm in world production and trade, leading to a focus on trade in value added.**

**This can also be studied as a network:**

One example... “The networks of value-added trade”,  
Amador and Cabral (2015)

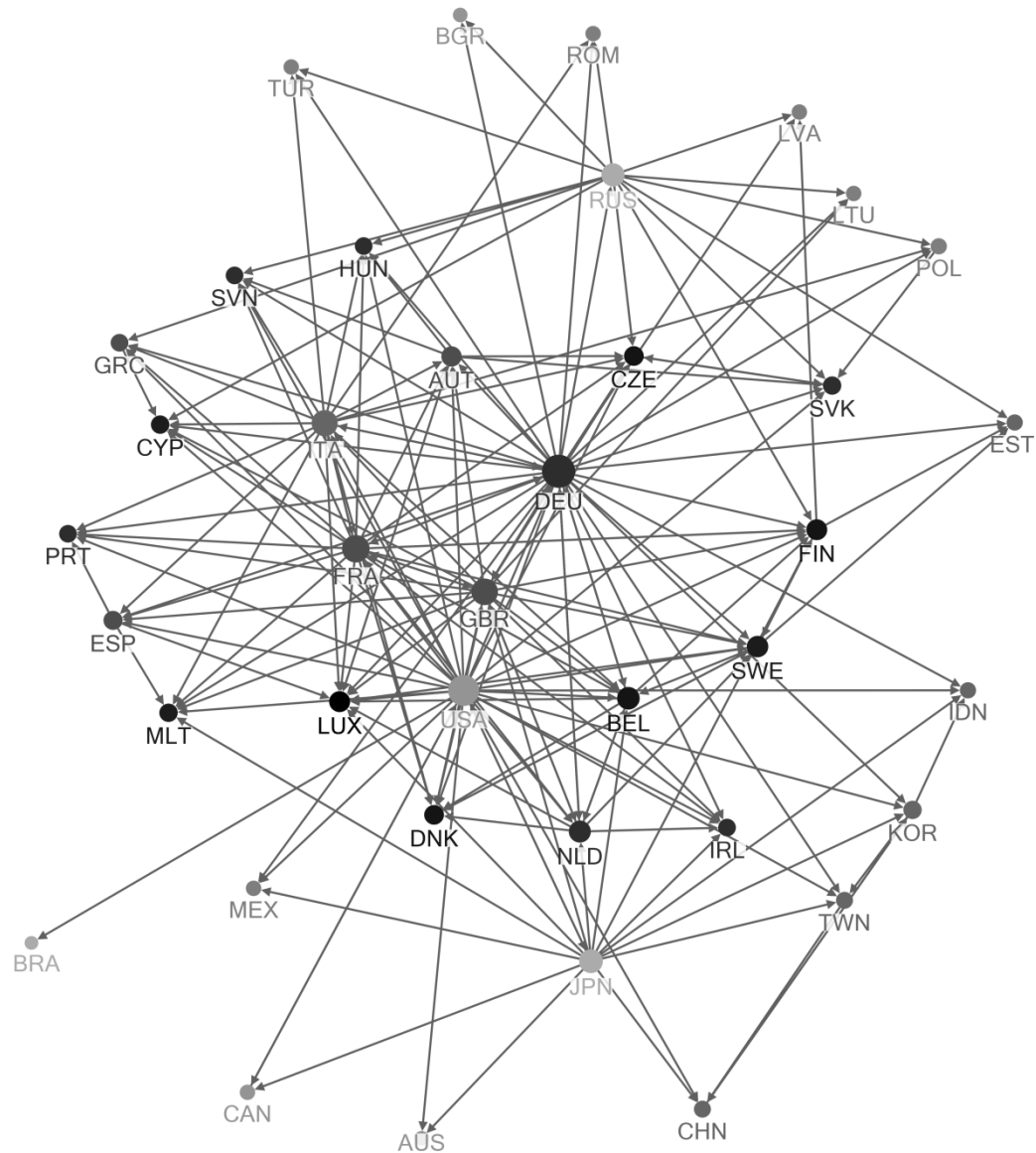


## Setting-up the network (directed and binary):

- Nodes (40 countries in the WIOD database)
- Edges (if exports of country A embody more than 1 per cent of value added originating in country B)
- Period 1995-2011, 35 sectors

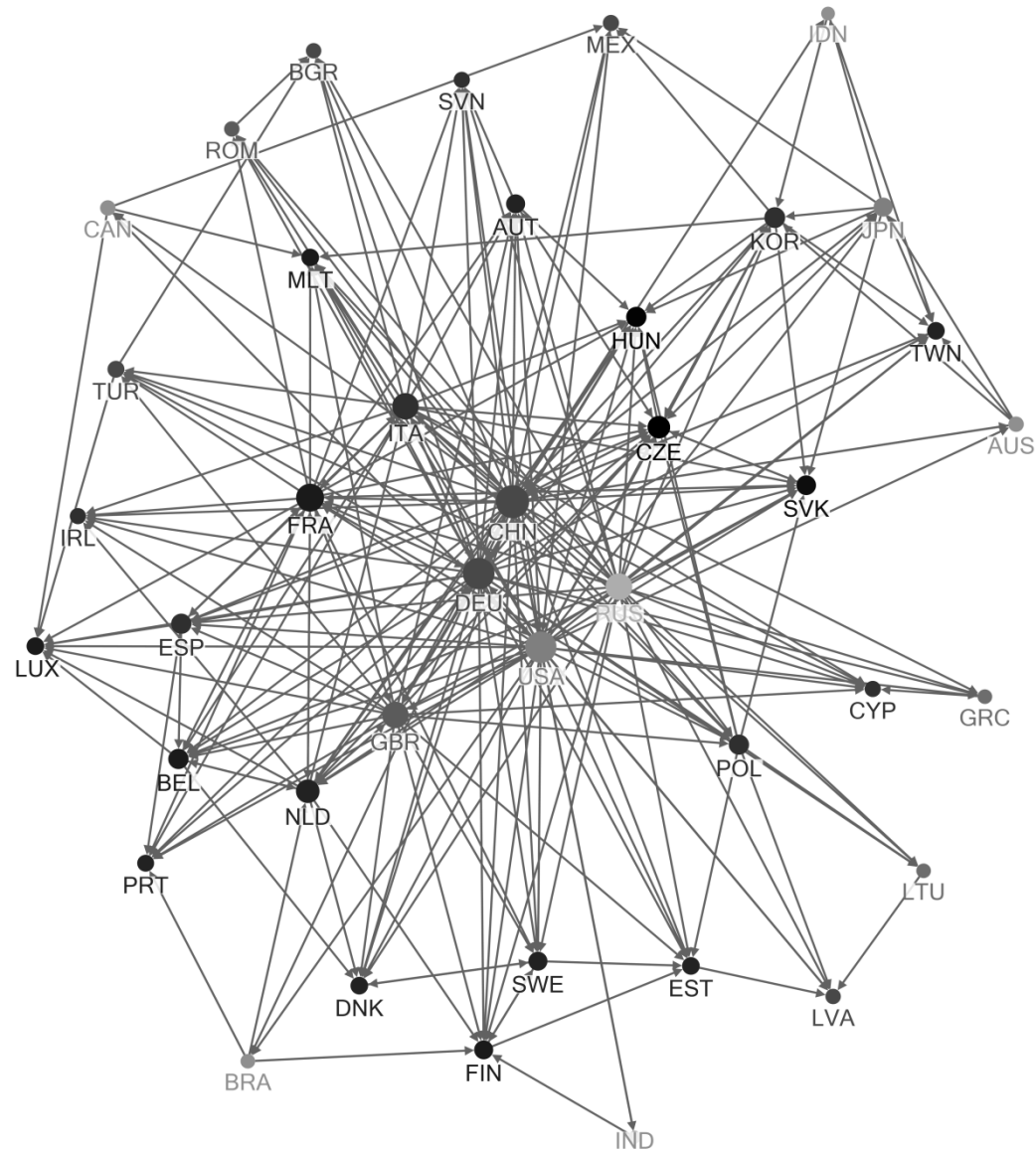


## 1995



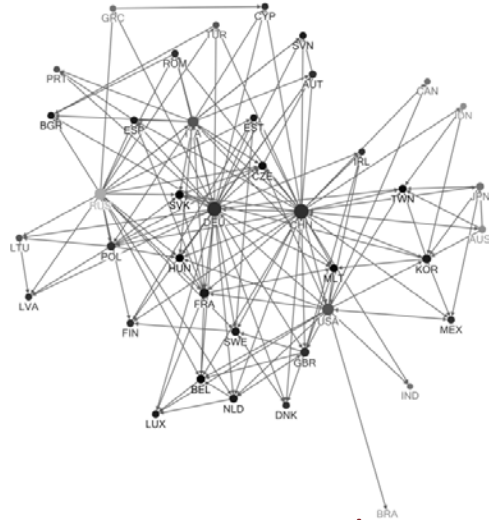


## 2011

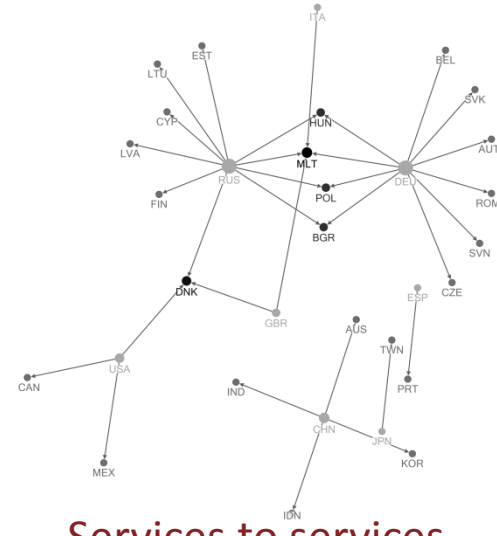




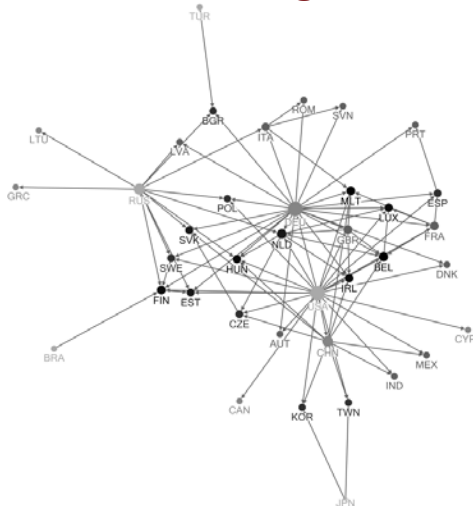
## Goods to goods



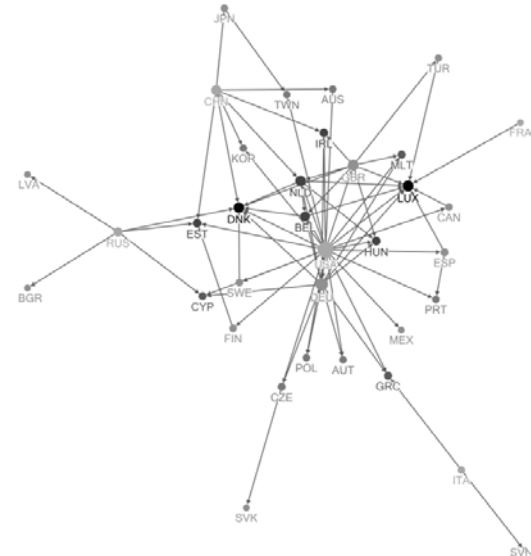
## Goods to services



## Services to goods



## Services to services



2011





## The utilizations:

- Identification of hubs in GVCs and their sectoral patterns
- Propagation of shocks and resilience

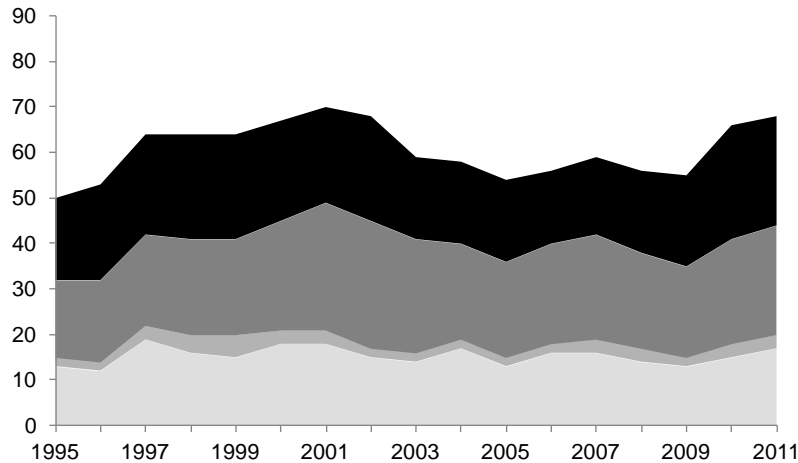
## Way forward:

(...)

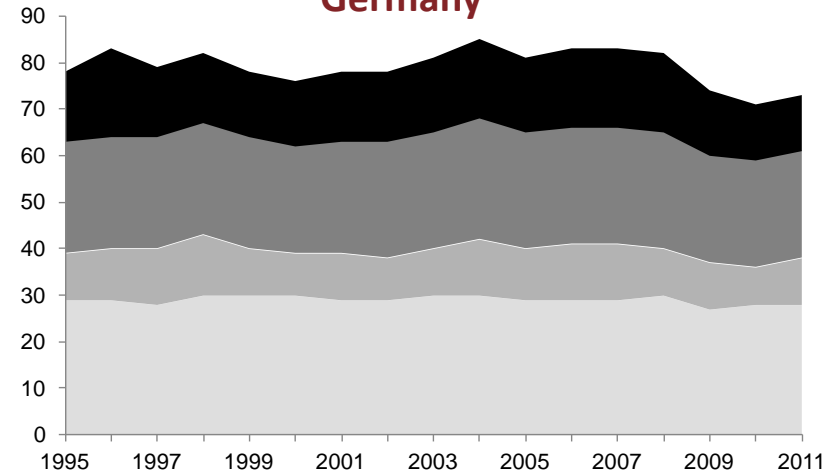


## Whom-to-whom in GVCs

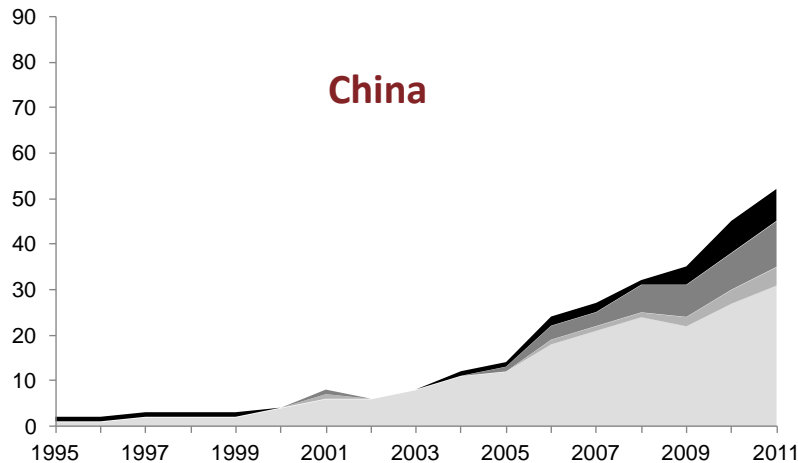
### US



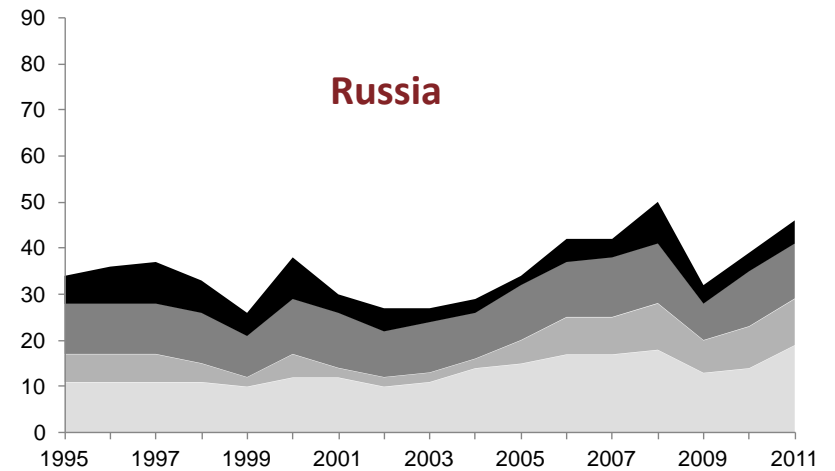
### Germany



### China



### Russia



■ Goods inputs to goods exports

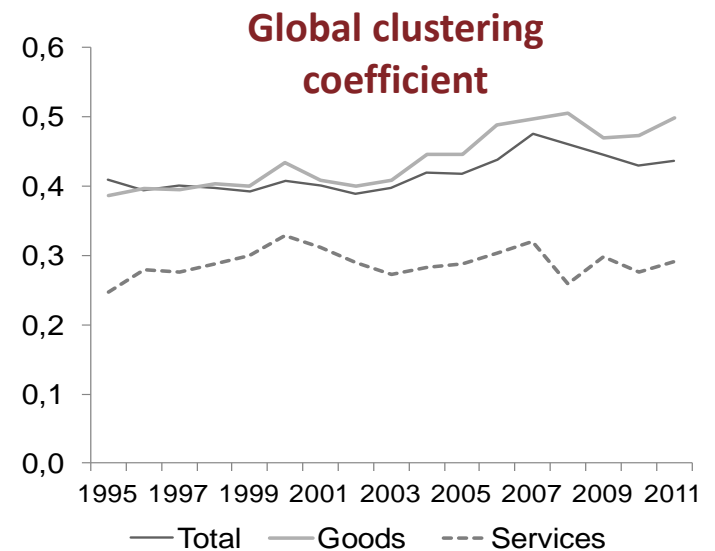
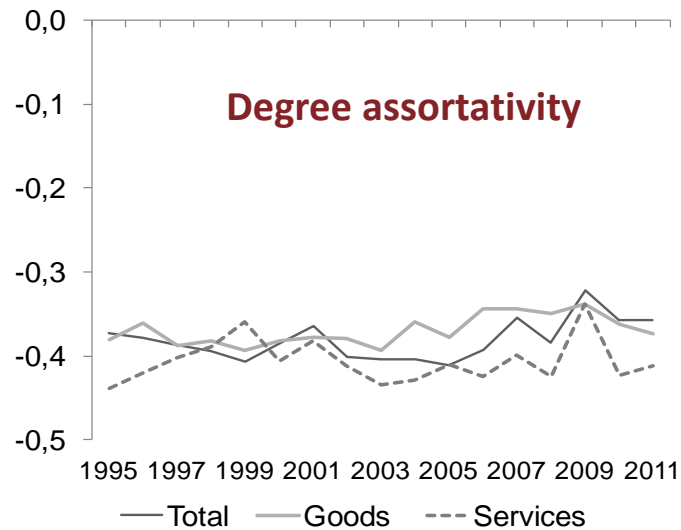
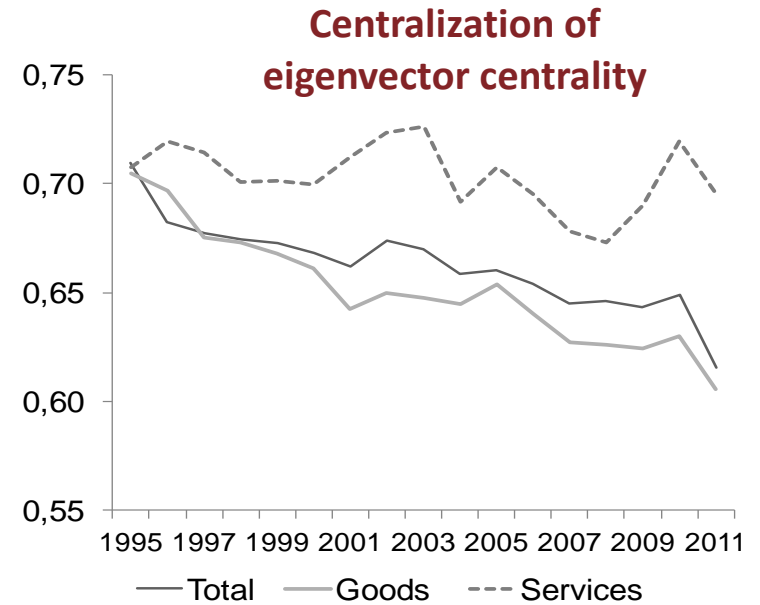
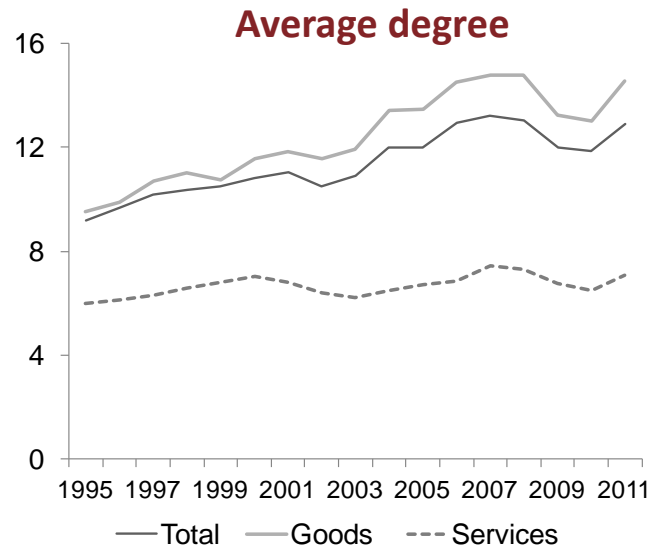
■ Services inputs to goods exports

■ Goods inputs to services exports

■ Services inputs to services exports



## Whom-to-whom in in GVCs





## The utilizations:

- Identification of hubs in GVCs and their sectoral patterns
- Propagation of shocks and resilience

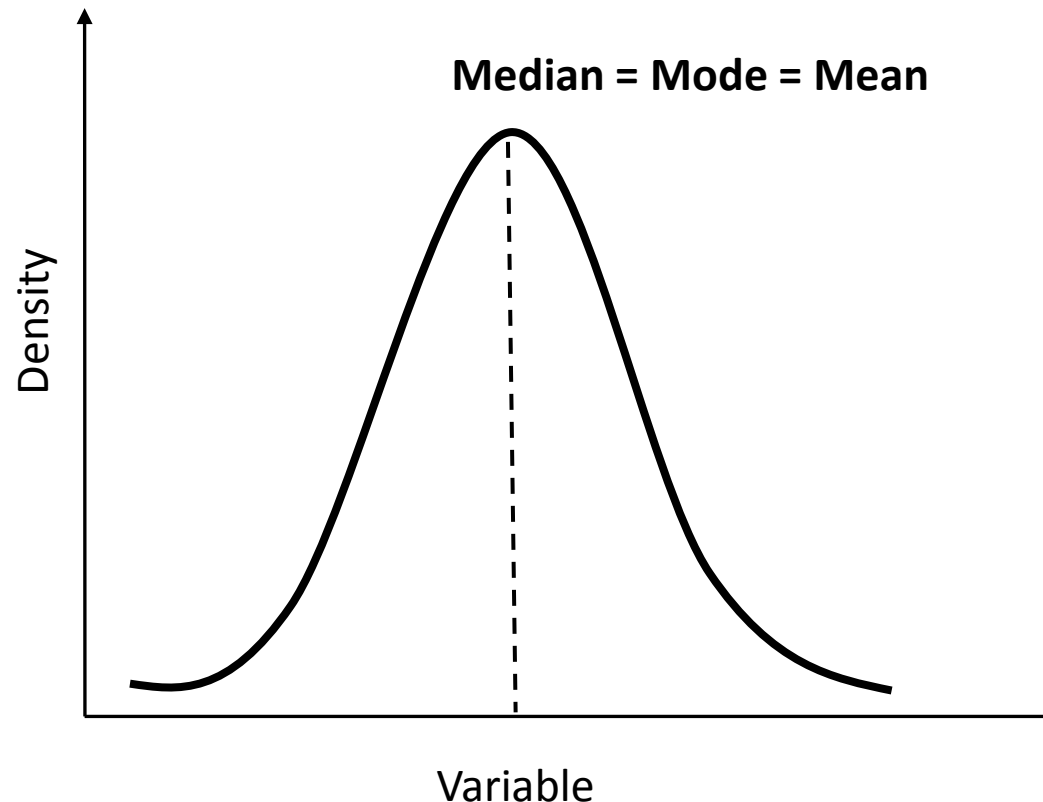
## Way forward:

- Broad usage of indicators in value added terms and update of global IO matrices
- Internal transactions and B2B data



Firm-level data is a key source of information. Policies tend to target the median firm.

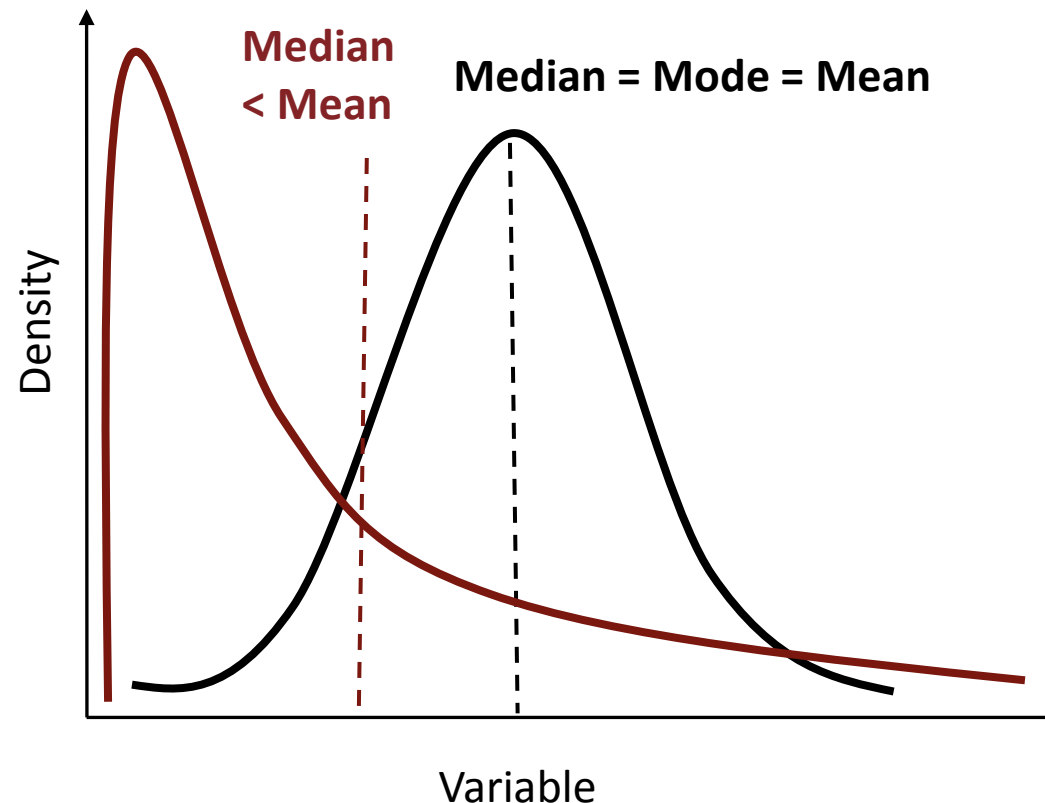
In a Gaussian world, the median matches the average but...





## The importance of comparable firm-level data

...the world is better described by a Pareto distribution.  
Information on the full distribution is needed, i.e., firm-level data.  
The cross-country comparability is key to set useful benchmarks.





The **ESCB CompNet** has been working on the computation of comparable firm-level indicators, with a focus on **competitiveness**.

National teams run shared code on their databases (**trade, productivity, labour market, financial and mark-up modules**).

Some papers have been produced and similar efforts take place at other institutions. The effort to collect comparable firm-level data must proceed.



**Thank you**