Quality challenges in modernising official business statistics

Workshop on innovation, GVCs and globalisation measurement

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- Business statistics about R&D
- What is difficult to measure due to GVCs
- Some thoughts towards solutions

Viewed through the lens of quality

- Do you measure well what the statistics aim to measure?
- Are the produced statistics “fit for use”?

Some questions are more difficult than others

R&D in your country as a share of GDP?

Important indicator for ministry of Economic Affairs.

How much R&D is used in production of an industry? How much is home-based and how much is foreign?

The first question can be answered with national data only and is therefore easier to answer. Note that **business statistics measure only the 1st step in the chain**, be it trade, FDI or R&D.

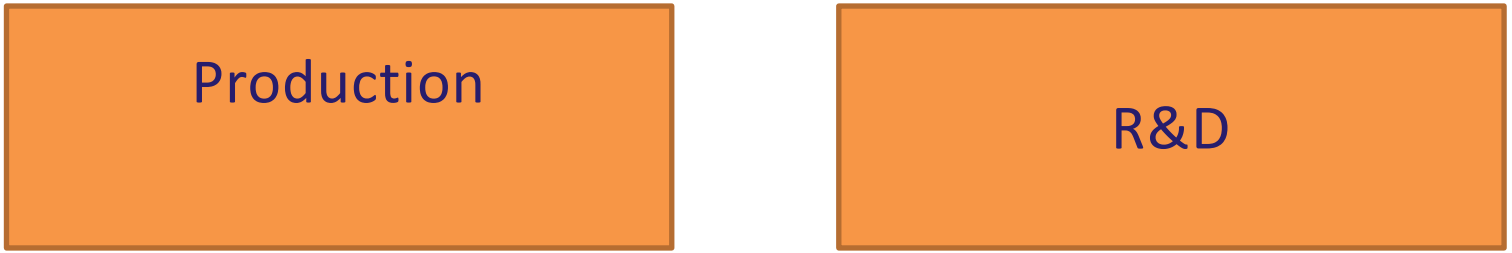
Long ago: life was easy

Production and R&D at the same unit

Send surveys to these units and all will be well

If one assures that quality of coverage, sampling, dealing with non-response and processing is ok, administrative burden for firms and costs for NSI not too high, timeliness, accuracy, comparability with earlier years and with other statistics ok, et cetera.

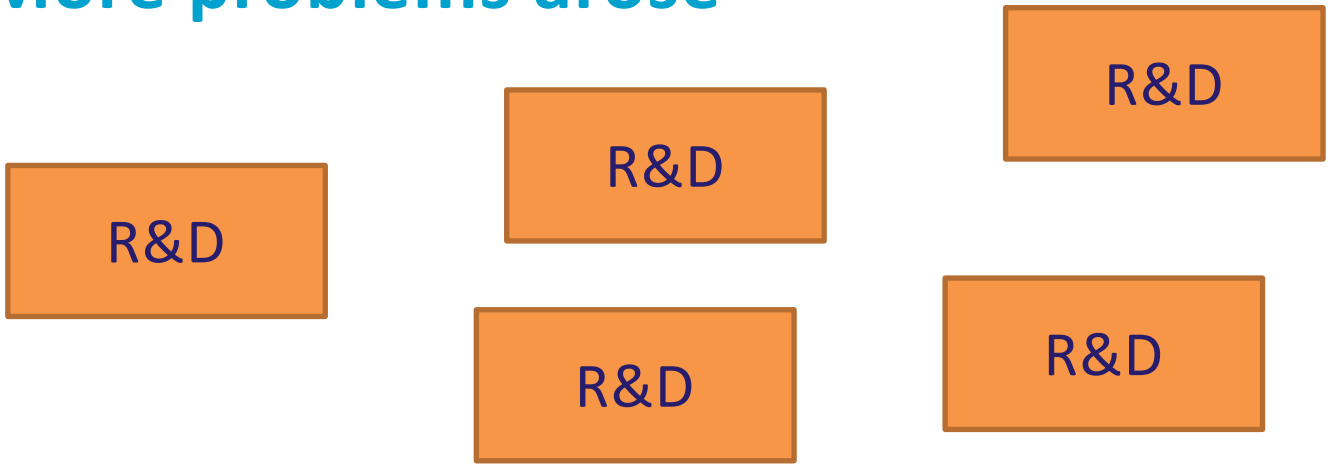
It got a bit more difficult: large firms



A large firm has production and R&D in different units

Quality issue: do we have the right units? One can use a large case unit to profile large and important firms. Delineate their structure,find out where the information is, communicate with the relevant unit and send it the survey. Use **micro data linking** (MDL) to connect production and R&D of the same firm. In short: tailored approach and post-processing data.

More problems arose



Not only the large firms, but many small firms do R&D as well.

Quality issue: do we have the whole population? Use registers, e.g., from tax credits on R&D, or big data obtained with web scraping to pinpoint the relevant firms.

Arising of GVCs complicates matters

- International trade of goods and services
- Foreign direct investments
- Fragmentation of production processes

New structures within and between firms arose (see Sturgeon presentation)

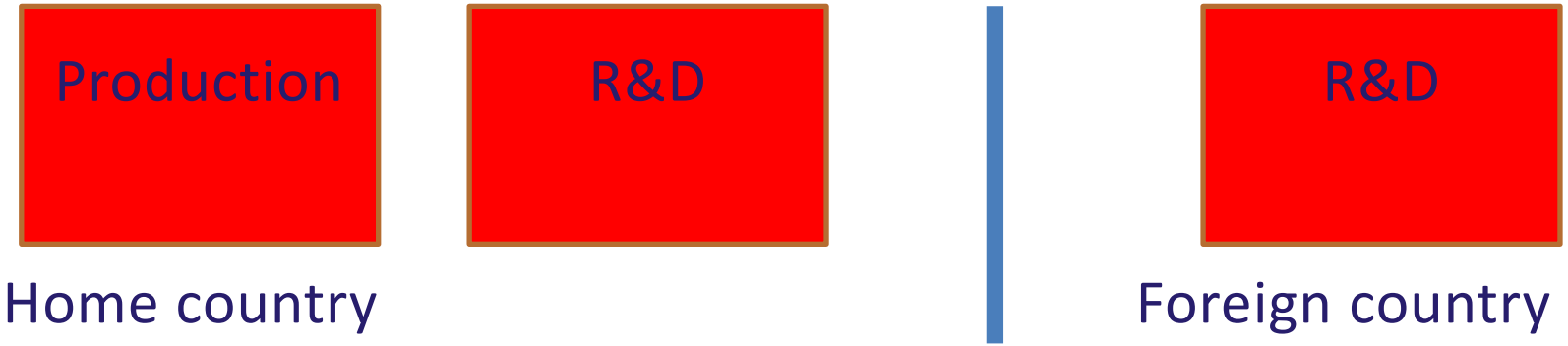
Problem: measuring R&D in the home country is difficult enough, measuring it abroad or in international links is even more difficult. Next examples concentrate on input of R&D in the GVC. There is a similar story for output of R&D in the GVC.

Going abroad – a simple case

A domestic firm buys R&D from a foreign firm outside the parent company

Quality issue: Can we still measure all R&D inputs? Adapt the survey to ask the right questions. Basically, there is a paid bill for R&D somewhere.

Going abroad – a difficult case



A domestic firm buys R&D from a foreign firm inside the parent company. For example, after a foreign take-over because R&D is partially offshored to the parent company. R&D is still in the firm, just somewhere else. If you would not have it, **would the R&D statistic still be "fit for use"** at macro/micro level?

Quality issue: Can we still measure all R&D inputs? Statistical concept is not always the same as the concept/data at the firm.

R&D inputs from a parent/sister company abroad

R&D payments in different forms – not always a simple "paid bill"

- Import of services: R&D, licenses, royalties…
- FDI income outflow
- FDI re-investments in host economy
- Exports of goods or services
- Other

Possible tax incentives to have different pricing

Business data/concepts would have to be re-engineered to statistical concepts.

R&D employment possibly even harder

Do you know number of hours your coauthor abroad put in your paper?

What to do? Depends on the question. Not all will be feasible…

Similar to small & large case unit approach, micro-approach:

- Profile the worldwide firm using e.g., Eurogroup register, big data, commercial data, understand structure of firm
- “Do you use R&D from a parent/sister firm?” is easier to answer than a question about the value
- These 2 steps narrow down the relevant population
- Work on relation and communication with the firm, open up black box of the business, where is information located
- Consider to tailor the survey and/or post-processing of data

What to do? Depends on the question (II)

An input-output approach, more macro

Use multi region IO-tables with industries split by ownership (foreign/domestic), as in presentation of Wei et al., to account for heterogeneity between firms within an industry

Use multi region supply-use tables (as in e.g., WIOD) that are the basis of such MRIOs since they contain product dimension – derive an (country by industry) by (country by industry) by product MRIO.

Accounts for more steps in the GVC, but also requires more assumptions