Nordic-OECD project on Microdata linking to account for firm heterogeneity in GVCs

Session II: Linking of statistical registers and trade statistics
Meeting of the Group of Experts on Business Registers
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Bruxelles

Peter Bøegh Nielsen
Statistics Denmark
Globalisation: Measurement challenges

Official statistical production systems mainly designed to measure domestic not transnational activities

The dynamics of globalisation requires introduction of new concepts, e.g. Global Value Chains or business functions

Measuring enterprise relations is a new focus for official statistics

Changed framework conditions focusing on diminishing respondent burden on enterprises

Globalisation increases firm heterogeneity and needs for firm level analysis => integration of statistical registers from different domains
The traditional stove pipe production system

- Structural Business Statistics
- International Trade in Goods Statistics
- Community Innovation Survey
- Research and Development Statistics
- Foreign Affiliates Statistics (FATS)
Silos hamper an integrated approach
Reasons for Micro Data Linking

Need for breaking down the stove pipe approach to get a more holistic view

Increased value of existing, already collected data – without raising respondent burden

MDL serves an appropriate method to address the current most addressed research questions such as:

- Question is not “what do countries trade?” but “what kind of enterprises trade?” (size, activity, ownership etc.)
- Firm heterogeneity: Enterprises are increasingly becoming more heterogeneous
- Global Value Chains and the involvement of domestic enterprises in GVCs
The Nordic Council of Ministers project

Focus on exporting enterprises

- Micro Data Linking of international trade in goods and structural business statistics
- Establishing harmonised data bases in each Nordic NSI
- Execution of SAS programs developed centrally by each NSI
- Standardised tabular output delivered to coordinator

Focus on performance of SMEs, presence on different markets and Nordic strongholds (markets, products)

Nordic NSIs, STATDK coordinator

http://dx.doi.org/10.6027/TN2014-514
Firm heterogeneity (1): Exporters vs non-exporters
Are exporters regaining employment faster than non-traders?

Employment in manufacturing enterprises. 2011

Index 2008 = 100

Denmark  Finland  Iceland  Norway  Sweden

Exporter  Non-exporter  Exporter  Non-exporter  Exporter  Non-exporter  Exporter  Non-exporter

Outputs from national databases.
Firm heterogeneity (2): SMEs vs large enterprises
Are exporting SMEs better in creating jobs than large exporters?

Index 2008 = 100

Employment in exporting manufacturing enterprises 2011
New Nordic Council of Ministers project

Focus on firm heterogeneity:

- Traders vs non traders
- SMEs vs large enterprises
- SMEs: Dependent and independent
- Domestic vs foreign controlled enterprises
- Type of trader: two way/exporter only/importer only

Micro Data Linking feeding into TiVA

Nordic NSIs, OECD STATDK coordinator

http://dx.doi.org/10.6027/TN2014-514
Linking of statistical registers at enterprise level

- Foreign Affiliates abroad (OFATS)
- Business Register
- Foreign owned enterprises (IFATS)
- Structural Business statistics
- Foreign trade (goods)

Enterprise ID
## European Statistical Infrastructure

<table>
<thead>
<tr>
<th>Statistical Register</th>
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<td>Structural Business Statistics</td>
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<td>Foreign Affiliates Statistics (IFATS and OFATS)</td>
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<td>Community Innovation Survey</td>
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Measuring the degree of international orientation of enterprises

<table>
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<tr>
<th>Geo. Spread of trade</th>
<th>Global Trader (intra - and extra EU -trade)</th>
<th>Extra-regional trader (extra -EU trade only)</th>
<th>Home -regional trader (intra-EU trade only)</th>
<th>Non-trader</th>
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<td>Domestically controlled without foreign affiliates</td>
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<tr>
<td>Domestically controlled with foreign affiliates</td>
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</tr>
<tr>
<td>Foreign controlled with/without foreign affiliates</td>
<td></td>
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<tr>
<td>Total</td>
<td></td>
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Firm heterogeneity (3): Export by different types of SMEs

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<th>NACE section C</th>
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<th>Grand total</th>
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<td>Germany</td>
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<td>4</td>
<td>8</td>
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export pct
Dependent SME

export pct
Independent SME
Firm heterogeneity (4): Traders by type of trade. Manufacturing 2012

Per cent

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<th></th>
<th>Denmark</th>
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<tr>
<td>Importer</td>
<td>3</td>
<td>0</td>
<td>17</td>
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</tbody>
</table>
Firm heterogeneity (5): Exports from Global Traders by ownership. Denmark

2012
- Domestically controlled without Foreign affiliates: 36
- Domestically controlled with Foreign affiliates: 49
- Foreign controlled: 15

2008
- Domestically controlled without Foreign affiliates: 29
- Domestically controlled with Foreign affiliates: 49
- Foreign controlled: 22
OECD-WTO Trade in Value Added (TiVA)

Global production today:

• Explosion of trade in intermediates as firms (and countries) specialise in selected stages (tasks) of production

• Gross trade statistics increasingly embody components (and so value) created elsewhere...

• ….thereby increasingly ‘multiple count’ flows in intermediates as the production develops over several countries

This rise of Global Value Chains means that only using *gross trade statistics* gives an *incomplete and possibly even misleading picture of globalization*, resulting in imperfect policies
TiVA database

The joint OECD–WTO TiVA database includes 40+ indicators, e.g.

- Export value divided by domestically (direct, indirect, re-imported) and foreign produced value added
- Domestic value added embodied in foreign final demand (% GDP)
- Foreign VA embodied in domestic final demand (% GDP)
- Services VA embodied in exports

First statistics were released in 2013, latest release June 2015

- 61 economies, 34 industries, years 1995 – 2011

TiVA’s work horse: Inter-Country Input-Output Table (ICIO)

- The ICIO traces input-output relationships across industries AND countries
- The total direct and indirect input needs of any industry in any country to produce 1 unit (e.g. dollar) of extra output can be easily derived using the Leontief inverse of the ICIO (technical coefficient matrix), key to the calculation of a wide range of TiVA indicators

http://oe.cd/tiva
Motivation: Why account for firm heterogeneity in TiVA

Within industries, firms differ with respect to their product choices and production functions

- Foreign vs domestically owned firms
- Small vs large firms
- Exporters (importers) vs non-traders

Policy questions about how different types of firms within an industry differ with respect to their direct and indirect embeddedness in global value chains

Homogeneity assumption affects key TiVA measures: in particular, the import (foreign value added) content of export is likely to be underestimated
Use of microlinked data in TiVA

Limited set of indicators (four tables) that are derived from linked trade and business statistics

Firm characteristics:

- Firm size (SMEs_independent | SMEs_dependent | )
- Firm ownership (foreign | domestic_withaffiliates | domestic without affiliates)
- Firm trading status (exporter | non-exporter)
  - → prioritization in area of services [minimum sector breakdowns etc]

By industry:

- ISIC rev.4 2-digit
- Or at least: TiVA 34 industry aggregation

Partner country:

- Not necessary but may give additional insights

Carefully designed tables to ensure complementarity to existing data collections and linking possibilities
Future work: firm heterogeneity

Current TiVA work assumes homogeneity at industry level

Virtually all variables that are crucial for GVC analysis differ substantially between trading and non-trading firms; foreign and domestically owned firms; firms with and without foreign subsidiaries; and large or small firms (etc)

Capitalize on existing work on micro data linking to improve estimates and develop new, ‘richer’ indicators on GVCs (how, where, who)

NB: not just for TiVA, but extremely useful data in their own right for policy makers
Methodological Issues

Fundament: Identical enterprises across statistical domains

Positive co-ordination of samples across statistics

Longitudinal analysis: Demographic events a challenge (M&A vs. organic growth)

Observed versus imputed values
Thank you!

Peter Bøegh Nielsen
Statistics Denmark
pbn@dst.dk