Productivity and market selection in EU business services: role of regulatory policies

Henk LM Kox, CPB Netherlands Bureau for Economic Policy Analysis
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joint work with George van Leeuwen (CBS), Hildegunn Nordås (OECD), Arjan Lejour (CPB) and Henry van der Wiel (CPB)

Why the business services (BS) industry?

- Business services is - in terms of intra-EU trade - the single most important industry that is subject to the EU Services Directive

- Business services includes software (IT), engineering, consultancy, marketing: large role in innovation and disseminating 'best practices' across industries

- Productivity of EU business services industry has hardly increased between 1979 and 2007
  - BS is industry with single largest contribution to the 1995-2007 gap in labour productivity growth between EU25 and the USA (10)
  - Do knowledge-intensive business services (KIBS) perform better than non-KIBS busin. services? No! (11)
  - Is this characteristic for BS as an industry? No: cf. USA, UK (1)
Policy issue

- Policy issue: productivity stagnation in BS may hamper aggregate productivity growth and competitiveness in EU
  - **Directly**: BS >10% of total EU employment
  - **Indirectly through prices**: BS provides large share of all intermediate inputs

- European relative trade advantages in manufacturing are gradually dwindling in the world trade arena
  - Future EU needs strong and competitive services industries.

- What can the Services Directive and EU-wide follow-up policies contribute to an improvement?

Rest of this presentation

- Investigate the effectiveness of market selection for BS productivity
  - proxy for effectiveness market selection: persistence of scale diseconomies
  - decompose scale diseconomies and its sources

- Investigate the role of regulatory policies for BS productivity
  - national policies
  - EU-wide policies
Labour productivity appears to differ by size class: some descriptives (average for BS in 13 EU countries, 2000-2005)

Scale inefficiencies as proxy for effectiveness of market selection (1)

1. Thought experiment: consider steady state in a competitive industry with a homogeneous product and scale economies:
   - firms grow until they reach optimal scale
   - most firms will at least have optimal scale
   - result of selection: only firms close to the optimal scale will survive (this is our benchmark)
Scale inefficiencies as proxy for effectiveness of market selection (2)

2. Now consider a steady-state situation in the same market when barriers to market selection are important:
   - not all firms achieve minimal optimal scale: many will remain too small
   - other firms will remain too large despite having diseconomies of bureaucracy / weak internal efficiency
   - result: persistence of scale diseconomies between size classes

3. In reality we will never see a full steady state: due to turbulence and firm-specific factors, some firms will always operate below the efficiency frontier of even their own size class

Decomposing the relation between size and productivity in an industry with scale economies: steady state / actual
Factors that may hamper BS market selection

- Market power by incumbents

- Policies that hamper market selection:
  - creating entry barriers (e.g. start-up costs new firms)
  - creating exit barriers (e.g. bankruptcy laws, labour protection)
  - obstacles for post-entry growth and shrinking of firms (like size-related legal and administrative burdens, size-related tax breaks or subsidies)
  - Policy-related obstacles to import competition (e.g. policies that create sunk entry costs for foreign firms, VAT differences)

- Spatial effects (which firms compete in the spatially relevant market?)

Empirical strategy

1. Identify BS productivity frontier in EU (by size class, sector, country and year)

2. Assess X-inefficiency: the distance to the productivity frontier by size class, sector, country and year

3. Test hypothesis that distance to frontier - within and between size classes - can be explained from market power en regulation factors
First estimate scale diseconomies

- Will not annoy you with technical details, intuitive results (cf. 3)
- We combined two instrumental "workhorses" for the study of scale economies:
  
  a) global stochastic frontier model (GSF)
  - yields a first approximation of 'average' sample-wide frontier
  
  b) non-parametric data envelopment analysis (DEA)
  - Calculates 'best practice' frontier by sector, country and size class
  - allows to separate X-inefficiency within size classes and scale efficiency differences between size classes

- This gives us the X-efficiency and scale-efficiency indicators as proxies for effectiveness of market selection

Testing the effectiveness of market selection

- Hypothesis 1:
  scale diseconomies between size classes can be explained by market-structure variables and policy-related obstacles to market selection
  
  - market structure
  - national regulatory characteristics

- Hypothesis 2:
  scale diseconomies within size classes can be explained by weak mutual competition that does not force firms to adopt best practice technologies within their own size class
Data

- Panel data by \{sector * sizeclass * country * year\} from Eurostat business demography database:
  - 5 homogenised size classes (10) and 8 homogenised BS sectors
  - Yields a representative firm by 'data cell' (n = 2362)

- Indicators market structure (Eurostat):
  - average market share of firms within a data cell (1/nof)
  - firm entry-exit ratios (per industry and country)
  - HHI: index for concentration ratio of market shares by size class (per industry and country)

- Indicators regulatory environment (World Bank)
  - overall Cost of Doing Business indicator; starting a business (entry costs); closing a business (exit costs); costs of changing employment contracts (costs of growth / shrink)

Hypothesis 1: What explains different scale-efficiencies between size classes?

<table>
<thead>
<tr>
<th></th>
<th>1 Estimated</th>
<th>Z-value</th>
<th>2 Estimated</th>
<th>Z-value</th>
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<tbody>
<tr>
<td>Market structure:</td>
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<tr>
<td>* Average market share</td>
<td>0.015***</td>
<td>2.8</td>
<td>0.025***</td>
<td>4.4</td>
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<tr>
<td>* HHI</td>
<td>−0.013***</td>
<td>−2.0</td>
<td>−0.013***</td>
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<tr>
<td>* Entry-exit</td>
<td>0.326***</td>
<td>2.3</td>
<td>0.316***</td>
<td>2.2</td>
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<td>Regulation indices:</td>
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<tr>
<td>* Overall Cost of Doing Business</td>
<td>−0.238***</td>
<td>−5.5</td>
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<tr>
<td>* Starting a business</td>
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<td>0.01</td>
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<td>* Closing a business</td>
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<td>−0.313***</td>
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<tr>
<td>* Employment inflexibility</td>
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<td>−0.144***</td>
<td>−5.2</td>
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<td>Size-class dummies</td>
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<td>Log Likelihood</td>
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<td>138.8</td>
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</tbody>
</table>

Method: RE-based panel Tobit estimator
Comparison of 3 efficiency indicators by size class (average all BS industries and countries, 2000-2005)

Interim conclusions (1)

- **Hypothesis 1 supported:** persistence of scale diseconomies is found to be conditional on:
  - market structure (market concentration, intensity of entry/exit dynamics)
  - regulatory obstacles in relation to exit costs

- **Hypothesis 2 rejected:**
  - Small BS firms in the EU operate in a highly competitive market segment with much competition and very similar productivities, but...
  - they have huge scale-related productivity disadvantages compared to larger firms

- **Scale diseconomies form a major factor in the productivity performance of EU business services**
  - 95% of European BS firms falls within the size category that has huge productivity disadvantages (representing between 35-40% of employment)
Interim conclusions (2)

- Combined results on effectiveness of market selection:
  - Market segmentation weakens selection in BS industry
  - Weak competition between small firms and domestic large firms
  - Lack of import competition by foreign firms: does not force small firms to eradicate scale diseconomies
  - Improving market selection: has a level effect on productivity and also generates more productivity dynamics

- To improve productivity performance in European BS, more policy attention should be given to:
  - strengthen the role of market selection
  - facilitate post-entry growth potential of small, innovative firms
  - remove obstacles to exit and shrinking of large incumbents
  - enhance import competition (follow-up Services Directive)
  - remove policy obstacles to import competition, using intra-EU harmonisation or country-of-origin principle

A number of studies by CPB and OECD (2,4,5,6,7,8,9) indicate the services-trade gains from co-ordinated product-market regulation in the European market

- Well-designed domestic regulation can reduce trade costs
  - Reduce entry barriers and trade costs in own market

- Avoid excessive regulation
  - Restricts foreign suppliers from entering local markets
  - Also restricts domestic firms from entering foreign markets
  - Hurts SMEs more than large MNE

- If trade partners have heterogeneous regulations (product-market regulation, VAT regimes, labour laws) this forms a strong entry and trade barrier in its own right
  - Affects SMEs disproportionately, because of fixed/sunk costs
  - Small and remote countries can gain most from harmonisation
Simulation for illustrative purposes; trade increases by full harmonization of product market regulation between trading partners (Source: OECD study Nordås/Kox 2007)

Effects of more BS import competition

- More competition in domestic markets and earlier exit of low-productive domestic BS firms
- Upgrading of aggregate productivity level in European BS
  - CPB calculated this as a strong effect of the Country-of-Origin principle that has been left out of the Services Directive
- More market selection dynamics (dynamic efficiency gains)
- More economies of scale for exporting domestic firms when markets are open
- Cheaper inputs for manufacturing and services: enhanced competitiveness of EU in world market
Thanks for your attention

see references for full papers

References

Annex: A note on the use of representative firm by size class

- Recent discovery: firm size has a self-similar fractal distribution across and within size classes (Axtell 2001, 2006)
  - representative firm by 'data cell' implies that we also know something about neighbouring firms and the intra-cell distribution
  - it allows marginal analysis of scale effects

'Zipf'-like size distribution of BS firms in EU, 1999 (size measured by employed persons, log-log scale)