Defining and Measuring Metropolitan Regions: a rationale

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London needs to know how big it is

- It appears that by A.D. 1840 the people of the city will be 10,718,880, and those of the whole country but 10,917,389, which is but inconsiderably more. Wherefore it is certain and necessary that the growth of the city must stop before the said year 1840, and will be at its utmost height in the next preceding period, A.D. 1800, when the number of the city will be eight times its present number, 5,359,000 - William Petty (1662)

- Si l’on disposait d’images successives de ce marché ‘métropolitain’, on le verrait étendre, grossir d ’année en année, au rythme même où la ville s’accroît (en 1600, 250 000 habitants au maximum, 500 000 ou même davantage en 1700). La population globale de l’Angleterre ne cesse, elle aussi, de grandir, main moins vite. Alors, comment mieux dire qu’une historienne, a savoir que Londres est en train de manger l’Angleterre, “Is going to eat up England”? Jacques 1er ne disait-il lui-même “With time England will only be London”- Fernand Braudel
The Growth of London - AD 1750

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The Growth of London - AD 1880

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The Growth of London - AD 1914

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Not just a London issue

- Governments need common standards
  - to compare the situation of cities
  - to allocate and implement policy resources.
- This need is particularly important within the EU but is relevant also for OECD, UN and development agencies.
- Urban regions are likely to be the most relevant spatial units for the application of significant policy functions.
- Both European and UK regional policy increasingly focus on city-regions
- For policies to be efficient, city-regions need to define economically and socially valid geographies
Why a standard is needed

Estimates of 10-year productivity growth rates from 23 cities and 3 suppliers

Estimates from the different suppliers would be the same if they lay on this line.

Suppliers 2 and 3

Suppliers 1

GLAECONOMICS
What kind of standard?

- City definition cannot take political or administrative boundaries as a starting point. It should arise from socio-economic study of what a city is and does.
- We need comparisons across the world and at least with ‘world cities’ hence US, Europe and ideally Japan.
- There are broad continental variations – US cities evolved historically differently from European cities leading to different patterns of settlement. This has to be recognised.
- For the GLA, the requirement for a standard dominates over the requirement of scope for local variation.
- But we want to know how big the difference really is.
Three main existing approaches

- **US metro system**
  + long period of development
  + existing data for comparisons
  - different historical course of evolution

- **GEMACA**
  + Sound and robust methodology
  + Already tested and demonstrated
  – Not much extended outside Europe

- **Urban Audit**
  + official buy-in and support
  - uses administrative unit as core
  - permits a wide degree of local variation
  - not really a standard
What is in common and what differs?

- Common feature is a ‘core-hinterland’ or ‘Functional Urban Region’ (FUR)
- Core may be defined either as a densely populated area or an area with high job density (or otherwise eg building density)
- Commuting field consists of people that regularly travel into or communicate with the core for economic purposes, principally work.
- Both thresholds and criteria vary.
  - US system has ‘core’ defined by population, with a relatively low density (1000/500 per square mile = 4/ha), but relatively high commuting threshold (25 percent but includes out-commuting)
  - GEMACA has ‘core’ defined by employment with 7/ha = 1813/sq mile density threshold, and 10 per cent in-commuting threshold
The reasons for sensitivity testing

- We want to know if the difference makes a difference
  - The choice of population-based core in London leads to similar results to employment-based core; hence comparability suggests US system is worth considering
  - The size of core units however makes a big difference and hence LAU5 units are greatly preferable as foundation of the system
Issues

- Core defined by population, work density, or other criterion such as morphology
- What are the economic purposes of travel and communication?
- What size units are appropriate to define the core
- What is the threshold density for the core
- What threshold densities for in- and out-commuting?
- What size units to define the hinterland
- City-Regions: what criteria lead to the exclusion or separation of distinct conglomerations which fall statistically within a metro area eg Reading, Harlow?
Some initial results

- FUR size highly sensitive to the size of core ‘building block’
- FUR size relatively insensitive to the choice between population or work density
- Core size varies with core threshold densities, but FUR size varies by small magnitude over large spectrum of densities
- We have not yet investigated the sensitivity of FUR size to commuting densities or to the inclusion of out-commuting
- FUR size sensitive (for London) to whether the hinterland is composed of NUTS3 or NUTS4 building blocks.
- This is a significant problem since statutory Eurostat data is available only at NUTS3 level, which are relatively large in the UK.
### Sensitivities and data summary

<table>
<thead>
<tr>
<th>Employment Density Threshold Level</th>
<th>LAU2 units in total FUR</th>
<th>Resident population of total FUR</th>
<th>Workplace population of total FUR</th>
<th>Geographic area (sq mi)</th>
<th>LAU1 (NUTS4) units enclosing FUR</th>
<th>Resident population of LAU1 units enclosing FUR</th>
<th>Workplace population of LAU1 units enclosing FUR</th>
<th>Geographic area (sq mi)</th>
<th>Number of NUTS3 units enclosing FUR</th>
<th>Resident population of NUTS3 units enclosing FUR</th>
<th>Workplace population of NUTS3 units enclosing FUR</th>
<th>Geographic area (sq mi)</th>
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**Lowest/ Highest Density**

- LAU2 units in total FUR: 90%
- Resident population of total FUR: 93%
- Workplace population of total FUR: 93%
- Geographic area (sq mi): 83%
- LAU1 (NUTS4) units enclosing FUR: 96%
- Resident population of LAU1 units enclosing FUR: 97%
- Workplace population of LAU1 units enclosing FUR: 86%
- Geographic area (sq mi): 82%
- Number of NUTS3 units enclosing FUR: 89%
- Resident population of NUTS3 units enclosing FUR: 89%
- Workplace population of NUTS3 units enclosing FUR: 76%
- Geographic area (sq mi): 76%
1000 employees per square mile
1500 employees per square mile
1813 employees per square mile
2000 employees per square mile
2500 employees per square mile
1000 employees per square mile
1500 employees per square mile
1813 employees per square mile
2000 employees per square mile
2500 employees per square mile
1813 residents per square mile
1813 employees per square mile
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