London Calling?

KNOWLEDGE INDUSTRIES OF THE GREATER SOUTHEAST OF ENGLAND

TELECOMMUNICATIONS & CORPORATIONS

Three propositions:

1. That the region-scale is too coarse, and individual firm-scale too fine, to understand the sectoral dynamics of city-regions.
2. That different types of firms will leave measurable traces in digital infrastructures (*e.g.* magnitude & distribution).
3. That there will be more than an urban/rural, skilled/unskilled, large/small cities gradient to telecommunications usage.

TELECOMMUNICATIONS & WORK

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Mixed evidence about impact of ICT/telecoms on work:

- Information can be communicated instantly & globally.
- Given the alternatives, face-to-face is extraordinarily costly.
- But, so far, a surprisingly modest impact on where we work.

And the infrastructure itself hasn't really been helping us get to grips with this dynamic:

- Invisibility of electronic interaction undermines existing approaches to researching these issues.
- Interaction now extends across multiple channels simultaneously.

Or, how to cope with 8 billion phone calls.

METHODOLOGY

RELATED APPROACHES

- POLYNET (Hall & Pain)
  - High levels of specialisation within regions at city-scales.
  - Coarse interaction measures based largely on travel.
  - ‘APS’ firms treated as a single group.
- Journey-to-Work (Demires Ozkul)
  - Increasing commuting distances with SOC.
  - Strengthening polarisation by status.
- What’s missing is…. *communications*.

WHY USE THE PHONE NETWORK?

'Better to have the in-use properties of technology, not their espoused properties…'

Moss & Townsend (2000)

NEW KNOWLEDGE & NEW SECTORS

Can try to map types of knowledge work on to sectors:

- Analytical: R&D and ICT-type work.
- Synthetic: Finance, Law & other consultancy work.
- Symbolic: Art, Film & other ‘cultural work’.

Of course, shouldn’t draw hard boundaries around these:

- How do you classify video game designers?
- Or architects, for that matter?
- Nor are these necessarily stable across product or firm lifecycles

ABOUT THE EMPLOYMENT DATA

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Data provided by BRES/ABI:

- 10% sample at Output Area level.
- 5-year 'window'.
- Mix of SIC levels.

Zonal variation calls for relative measures of density:

- The Location Quotient (LQ) *still* gives us a good handle on this.
- *But*, can also give us some misleading results in places with low levels of total employment.

ABOUT THE PHONE DATA

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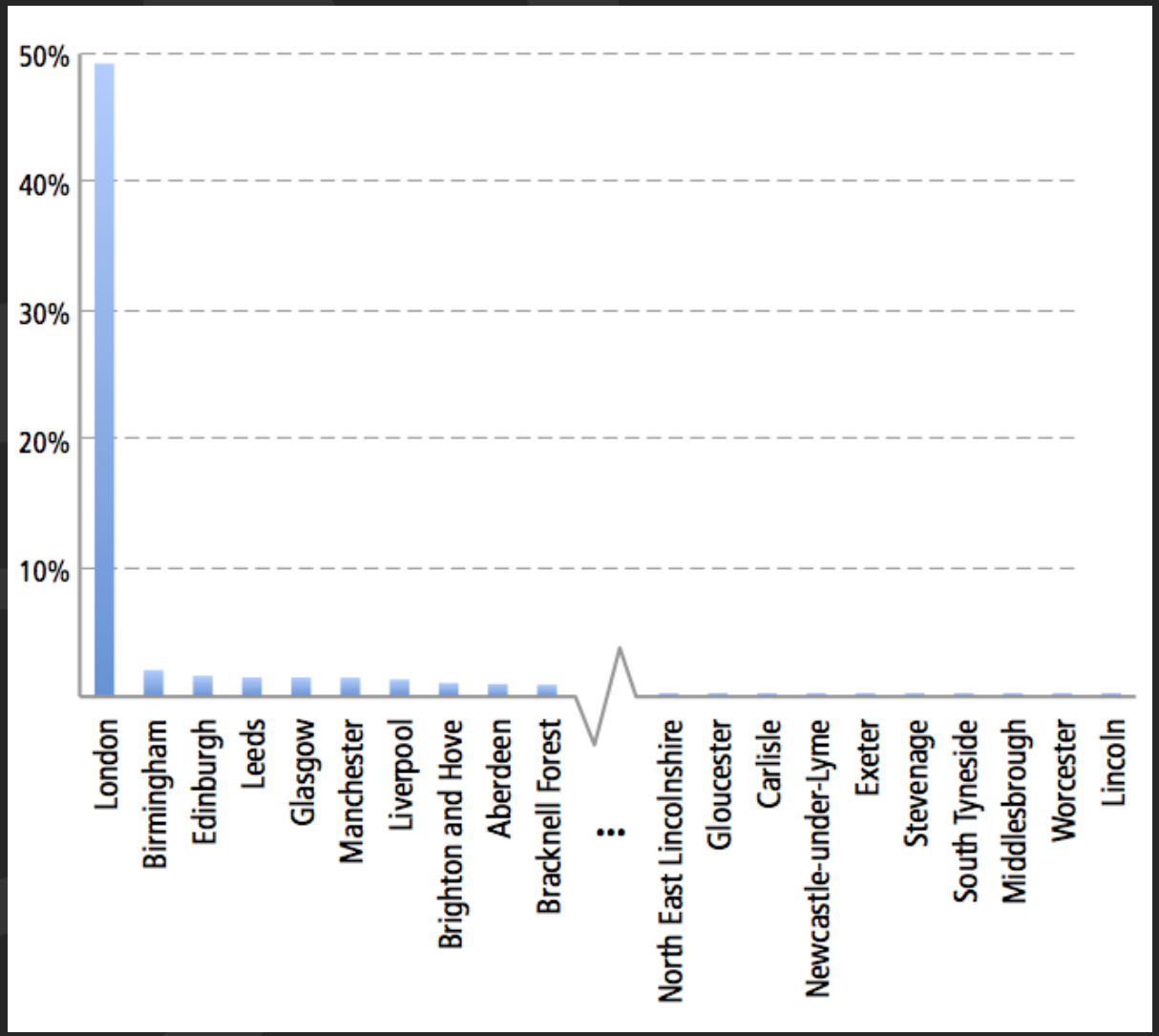
Data provided by a major telecoms operator:

- Month of August 2005.
- Covers roughly 95% of landlines in Britain.
- Includes domestic and international calling.

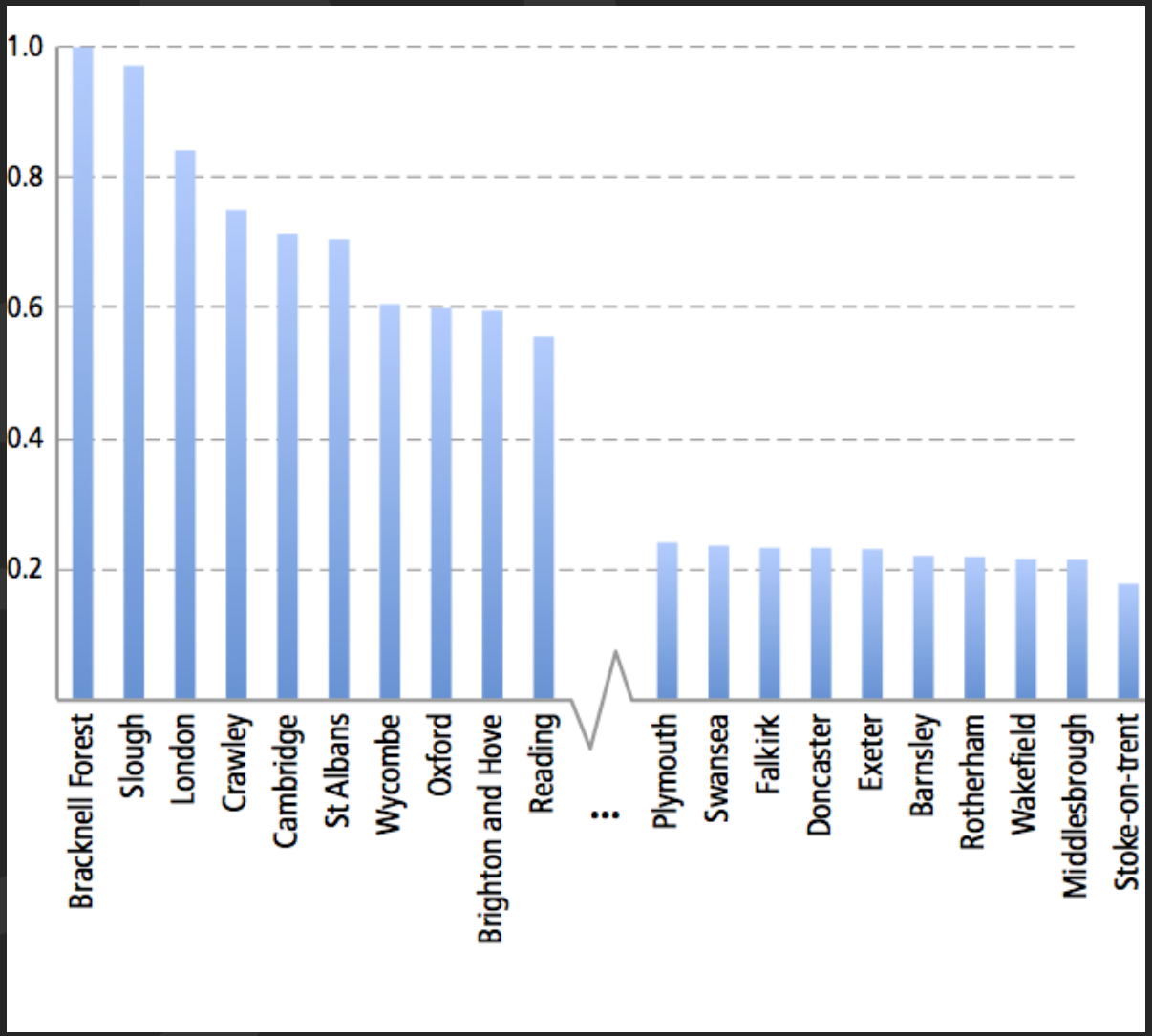
Pseudonymous to mitigate privacy issues:

- Calls to and from a given number can be grouped together, but the phone number itself is unknown.
- Lines localised to exchange areas (pools of *ca.* 1-3,000 lines)

THE PROBLEM OF RAW DATA



AFTER NORMALISATION



THE TELECOMMUNICATIONS QUOTIENT

Modelled on the Location Quotient (Florence):

$$TQ = \left(C_{iA} / C_A \right) / \left(C_{iR} / C_R \right)$$

- Provides a simple, scalar metric for ‘globalisation’.
- Computationally straightforward.
- Easy to interpret.

IS IT RELEVANT?

The TQ correlates much more strongly with both high-value businesses and managerial functions than it does with employment overall. Consequently, it seems like a good—if not perfect—proxy for knowledge work.

LIMITATIONS

Some limitations:

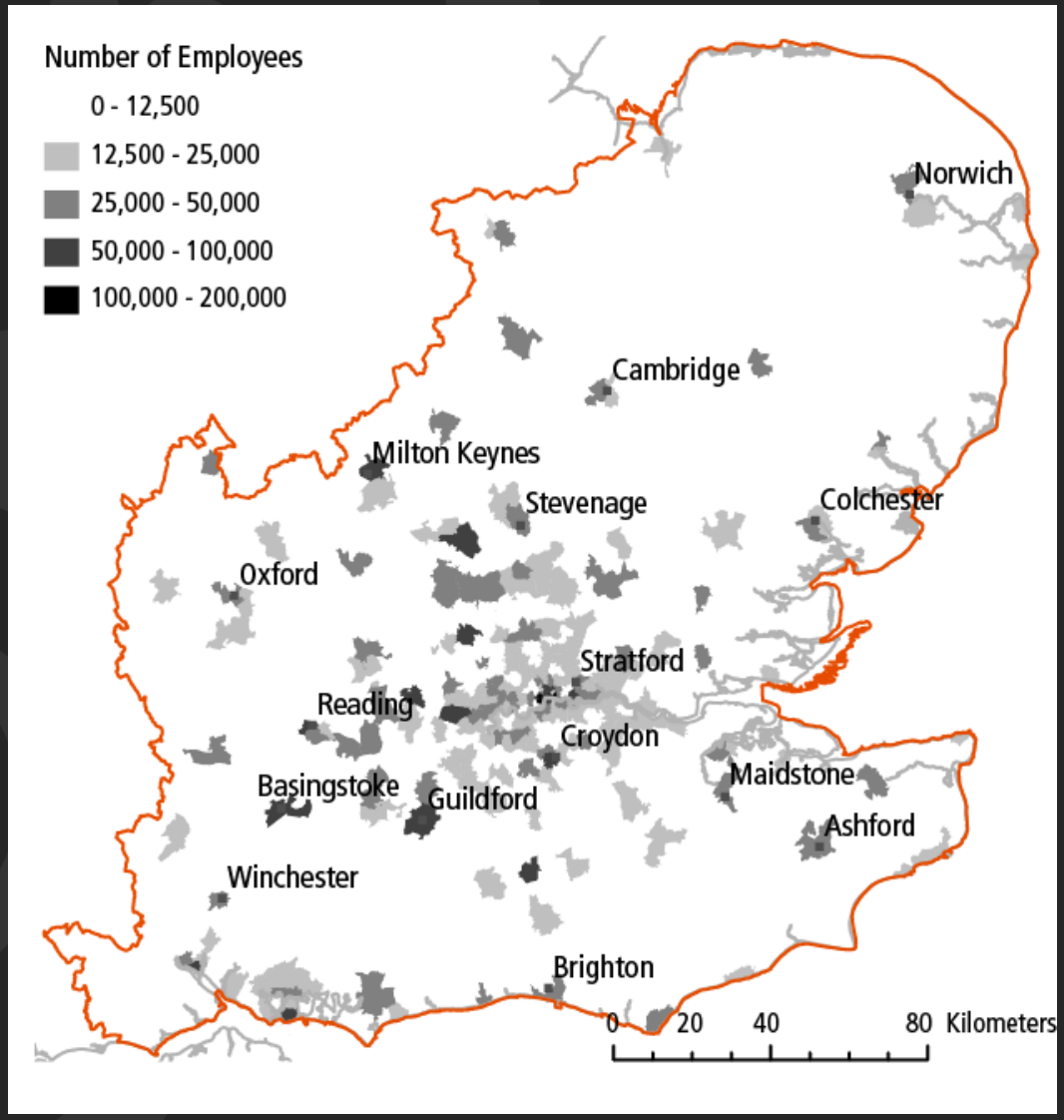
- Everyone in a firm the same SIC code—mail room to CEO!
- Ongoing shift to mobile and VOIP (less impact in 2005).
- Risk of ‘ecological fallacy’ from aggregation (associate international calling to the ‘wrong’ sectore).

However, these risks seem worthwhile since the data enables us to get at the *behaviour* of global firms in an entirely new way!

On with the show!

ANALYSIS

OVERVIEW OF THE GSE



DEVELOPING A MODEL

Useful to build a model that makes relatively few assumptions about the scale of 'neighbourhood effects':

- Moran's *I* gives us a way to determine the scale at which we find the most statistically significant evidence of clustering.
- Mark Correlation allows us to cross-validate Moran's using the covariance of attribute values.
- Getis-Ord's Gi* allows us to actually extract the statistically significant clusters once we've determined the appropriate neigbhourhood scale.

BUILDING A COHERENT PICTURE

Using all of these pieces we can build a full picture of sectoral behaviour:

- Iteratively use Moran's *I* and Mark Correlation to detect the scales at which clustering occurs in each sectoral grouping.
- Use Getis-Ord's Gi* to map out where this density is statistically significant (these *could* be considered agglomerations).
- Remove zones with very low amounts of total employment (*i.e.* less than 500 employees overall or 50 within a single base).
- Map the Telecommunications Quotient (TQ) for the remaining zones and examine the results (these *could* be

No really!

Please get on with the show!

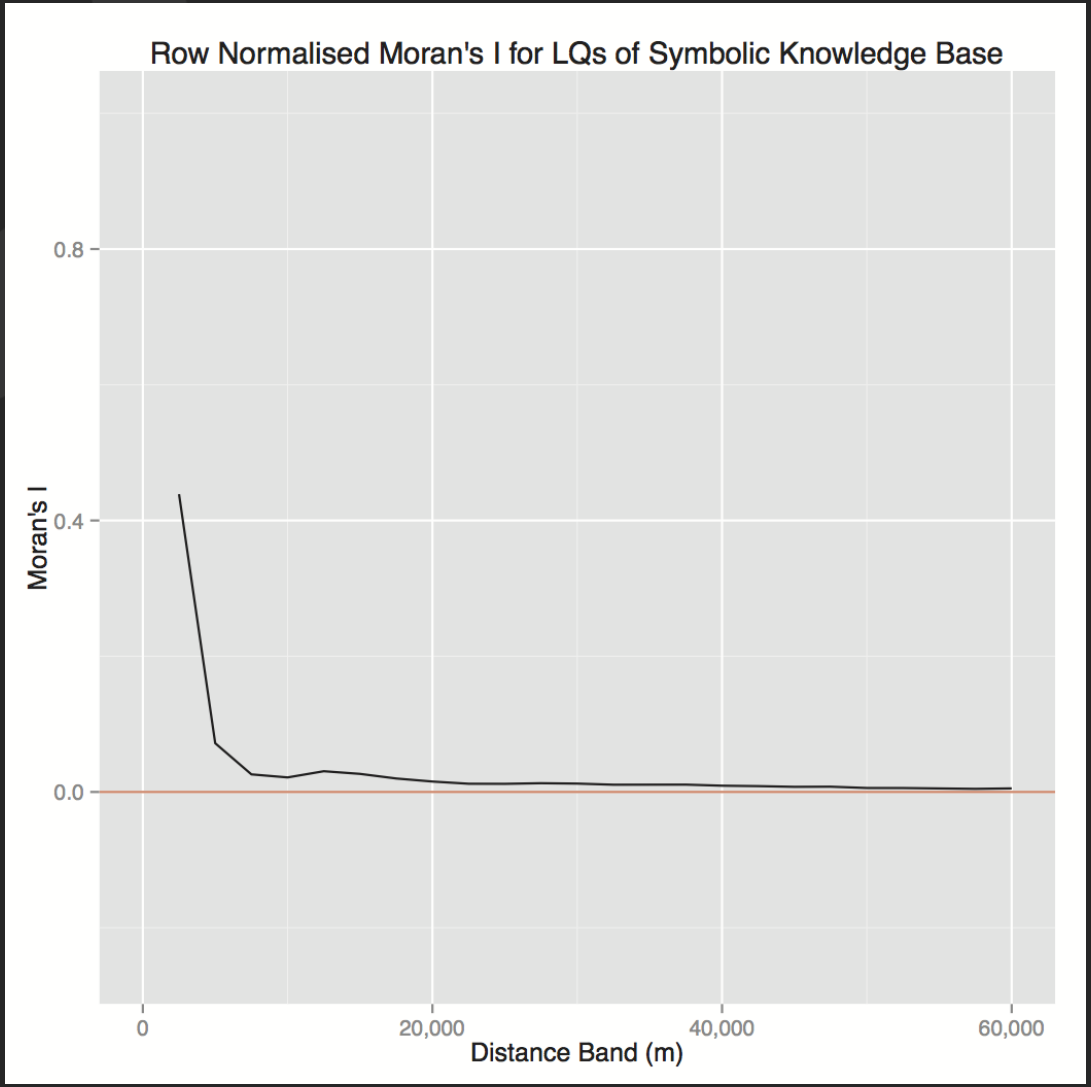
ANALYSIS

MORAN'S *I* IN DETAIL (JUST ONCE)

The Symbolic knowledge base gives us a nice starting point:

- Very strong autocorrelation under 10*km*
- A slight increase between 12.5 and 15*km*

But is it significant?



MORAN'S *Z*-SCORES IN DETAIL (JUST ONCE)

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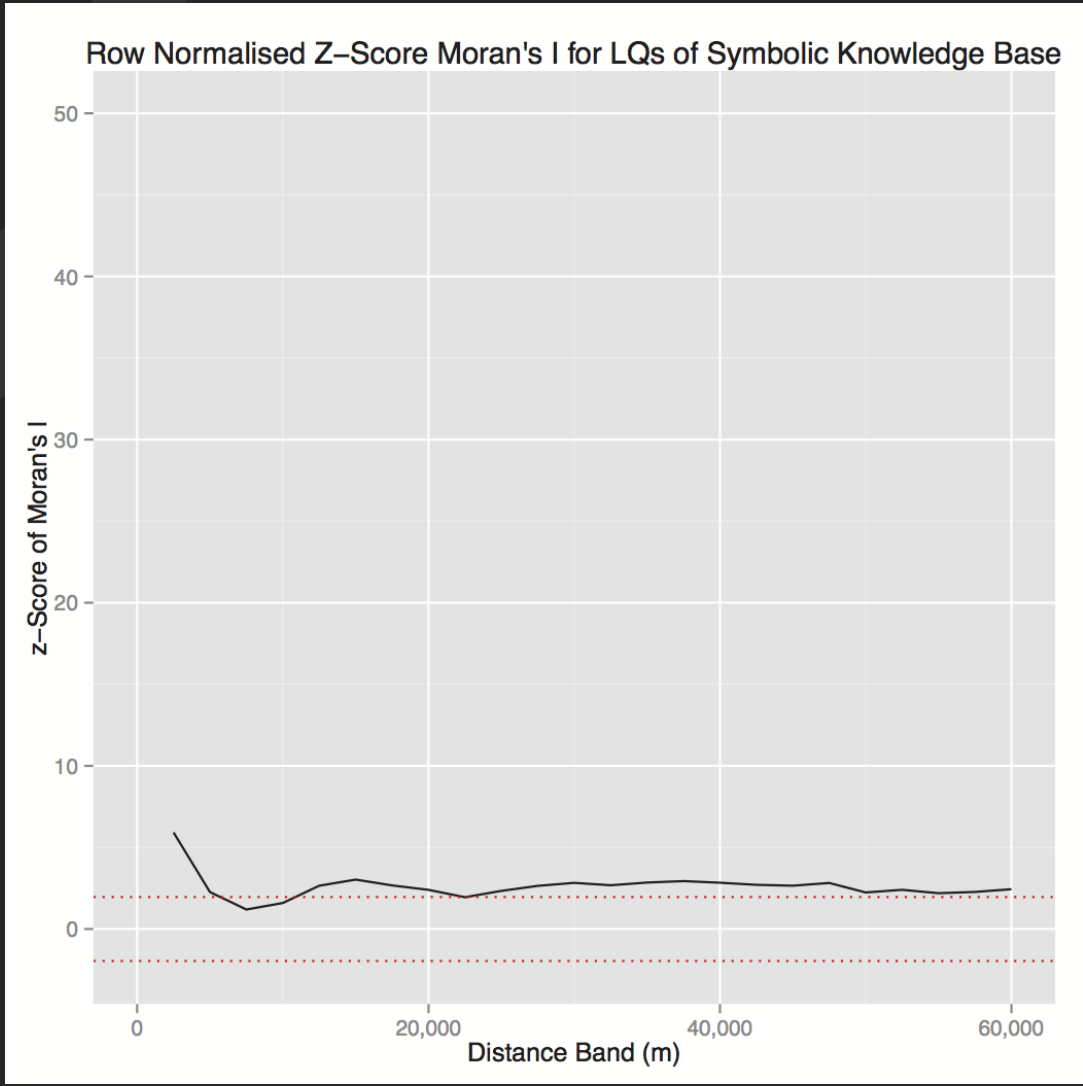
Statistically significant levels of autocorrelation at several distances:

- Very strong under 10*km*
- Detectable again between 12.5*km* and 20*km*

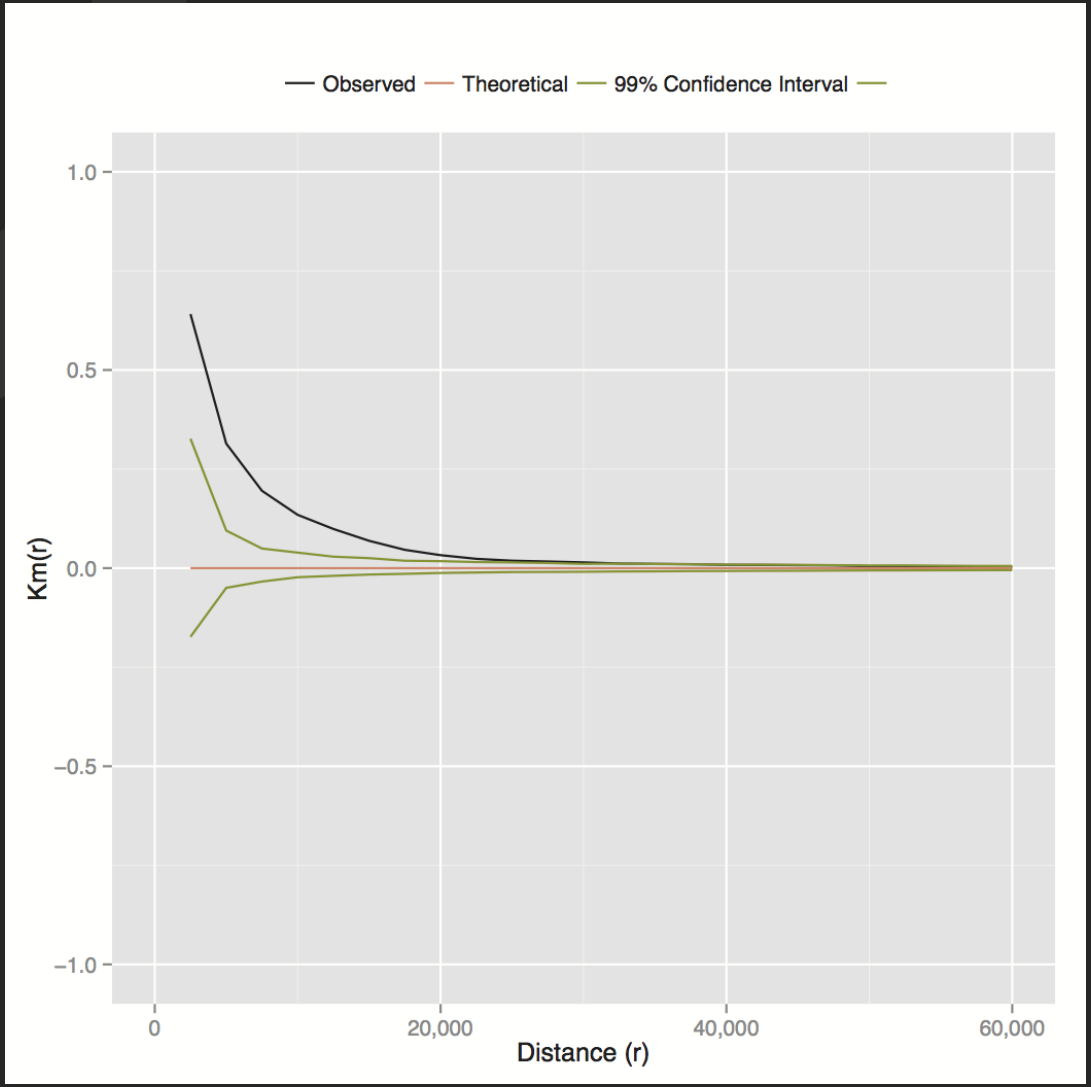
Amount of autocorrelation detected is significant at nearly all distances except between 7.5*km* and 12.5*km*.



MARK CORRELATION IN DETAIL (JUST ONCE)

Statistically significant mark correlation at several distances:

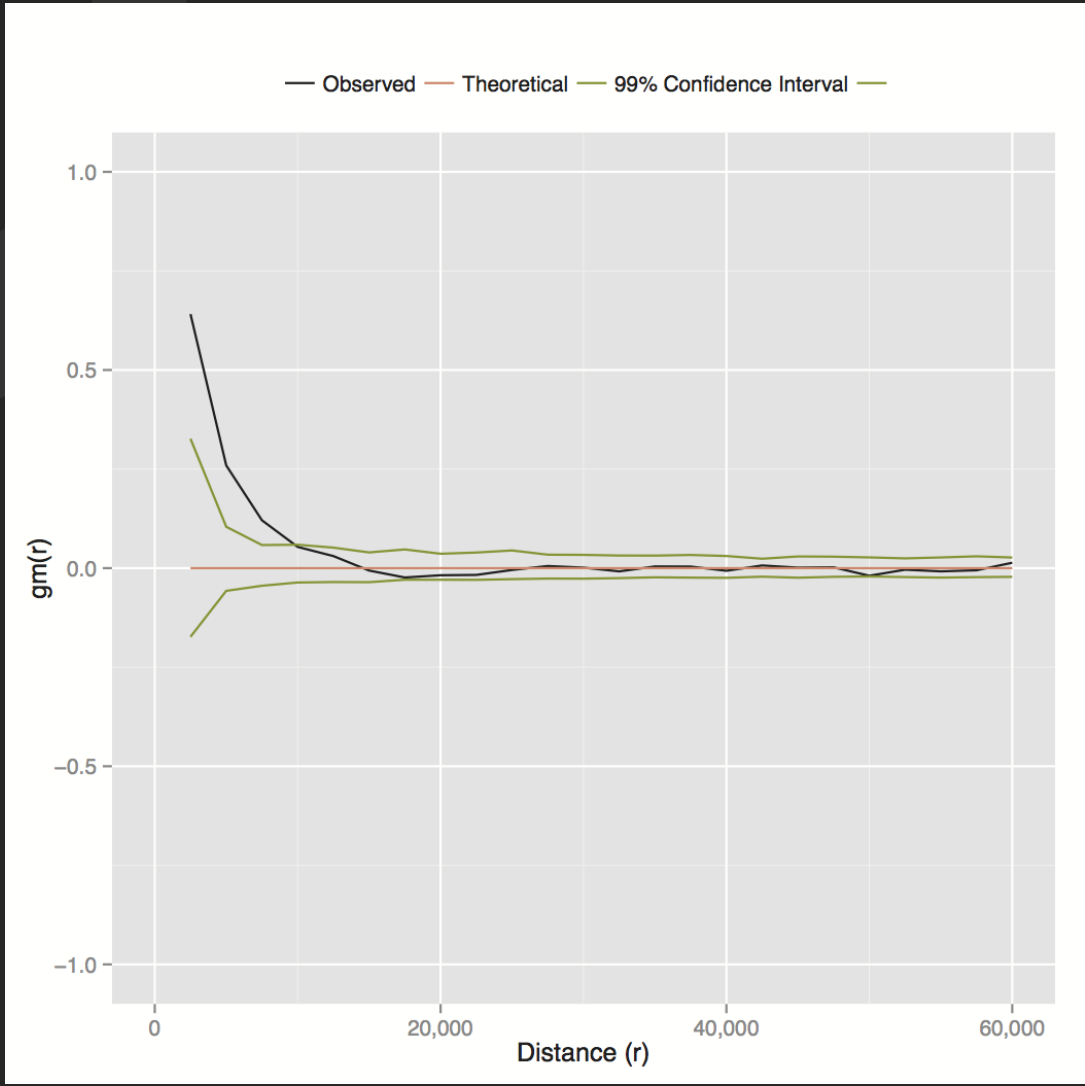
- Slight difference from Moran's *I*, but very high under 10*km.*
- And significant out to 30*km*.



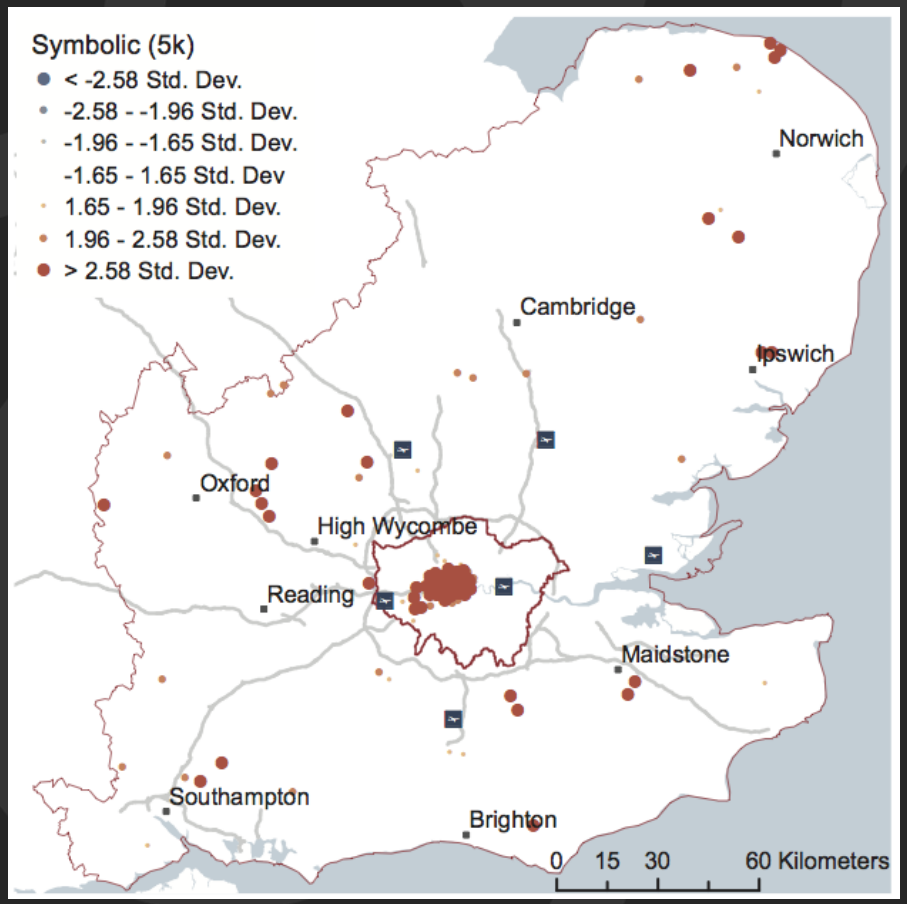
PAIR CORRELATION IN DETAIL (JUST ONCE)

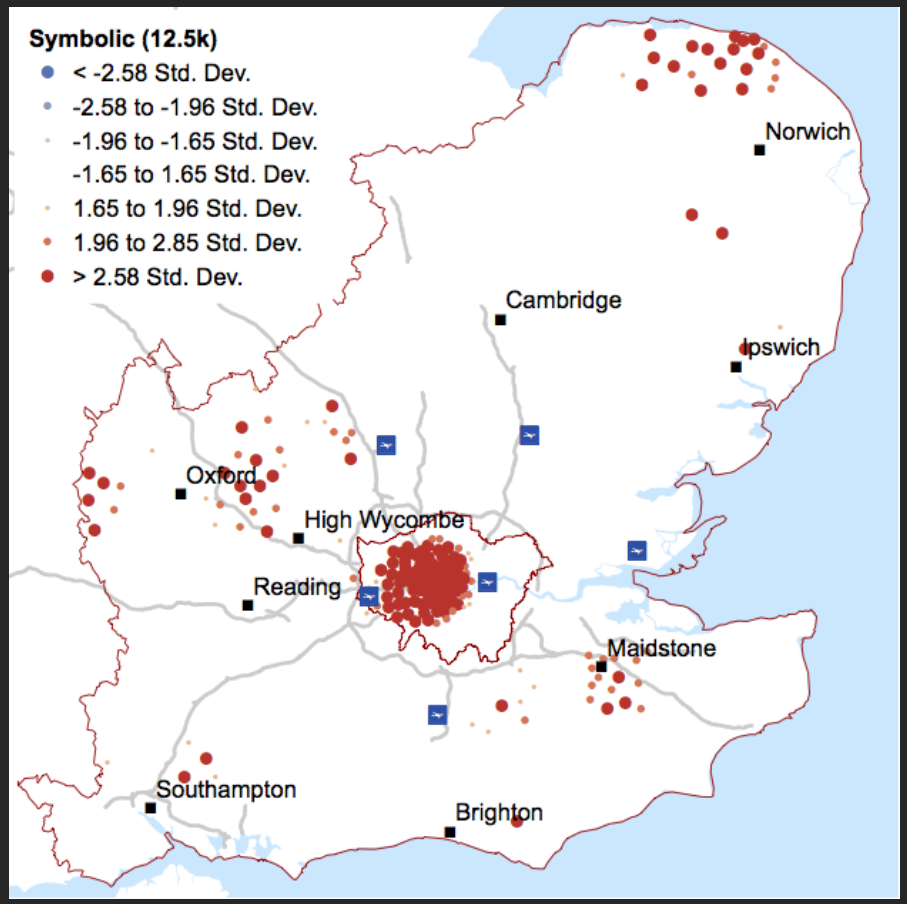
Quite a different view of the Symbolic knowledge base here:

- Doesn't fundamentally change our understanding.
- But does show that the key zone is for distances of less than 12.5*km*.
- Some suggestion of negative correlation at distances beyond 15*km*, but *not* statistically significant.

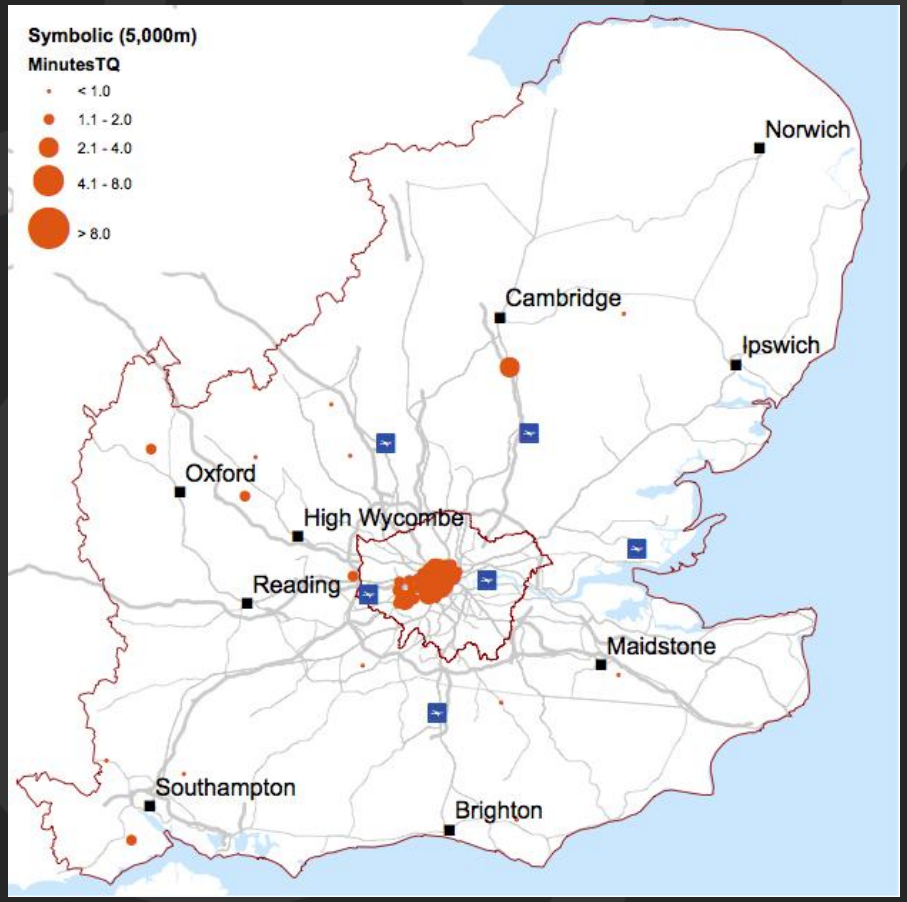


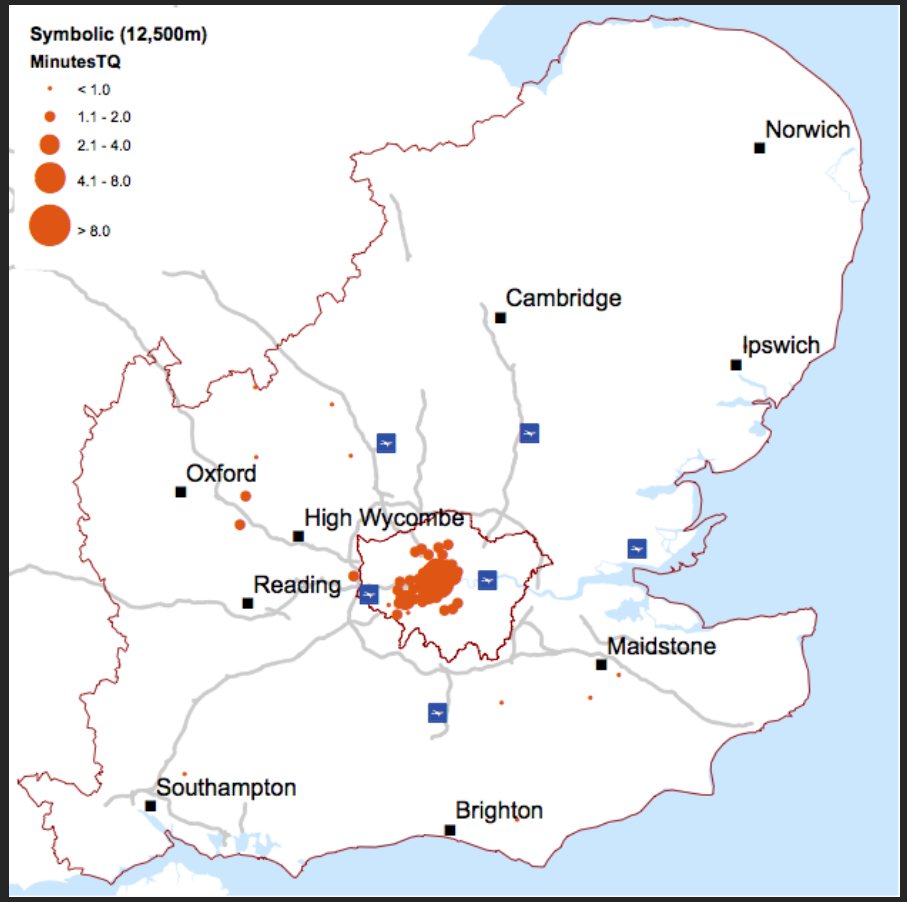
EMPLOYMENT CLUSTERS (SYMBOLIC)



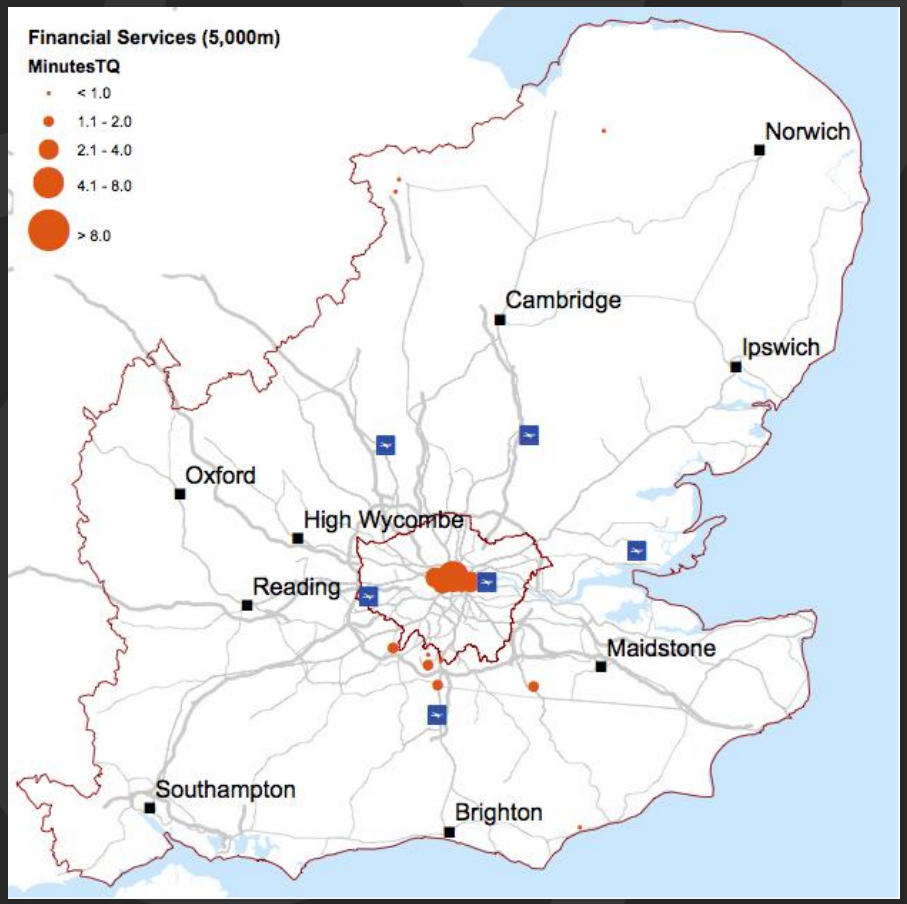


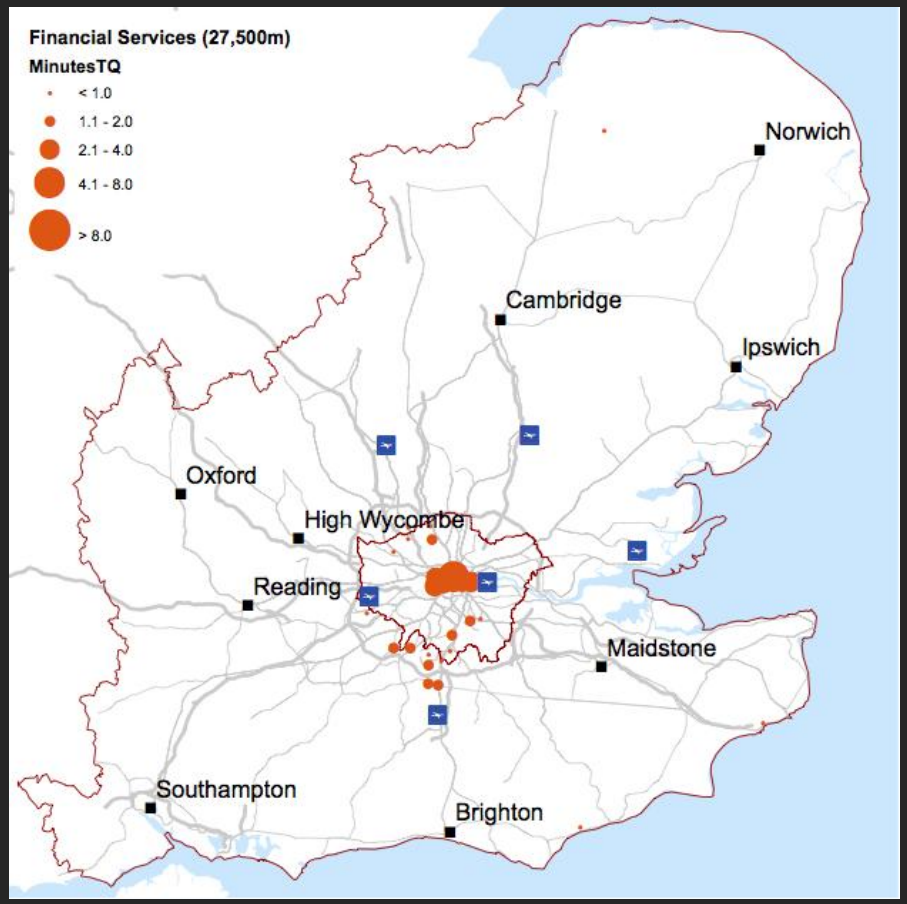
SYMBOLIC GLOBALISATION



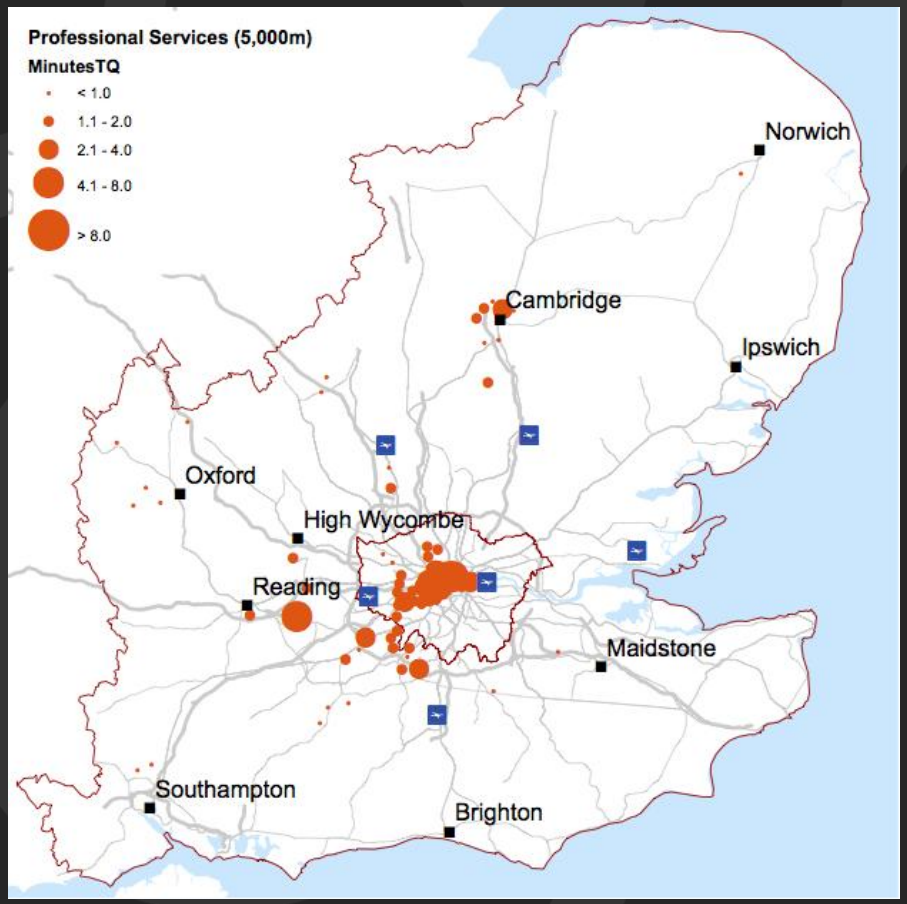


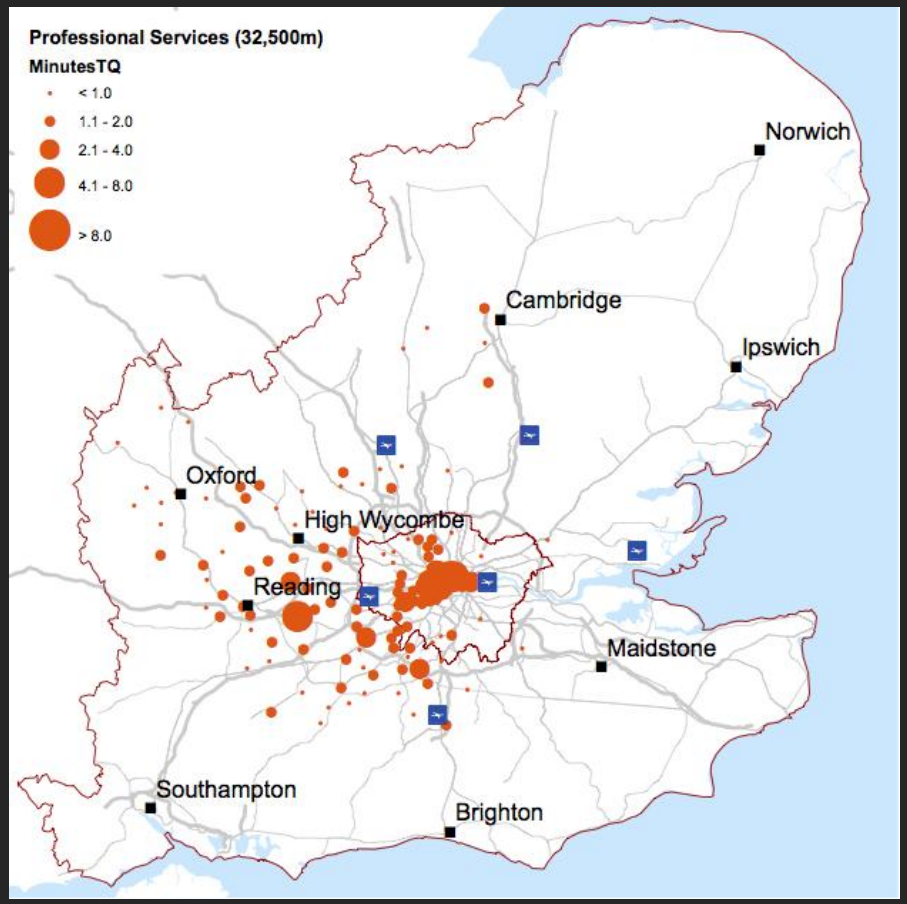
FINANCIAL GLOBALISATION



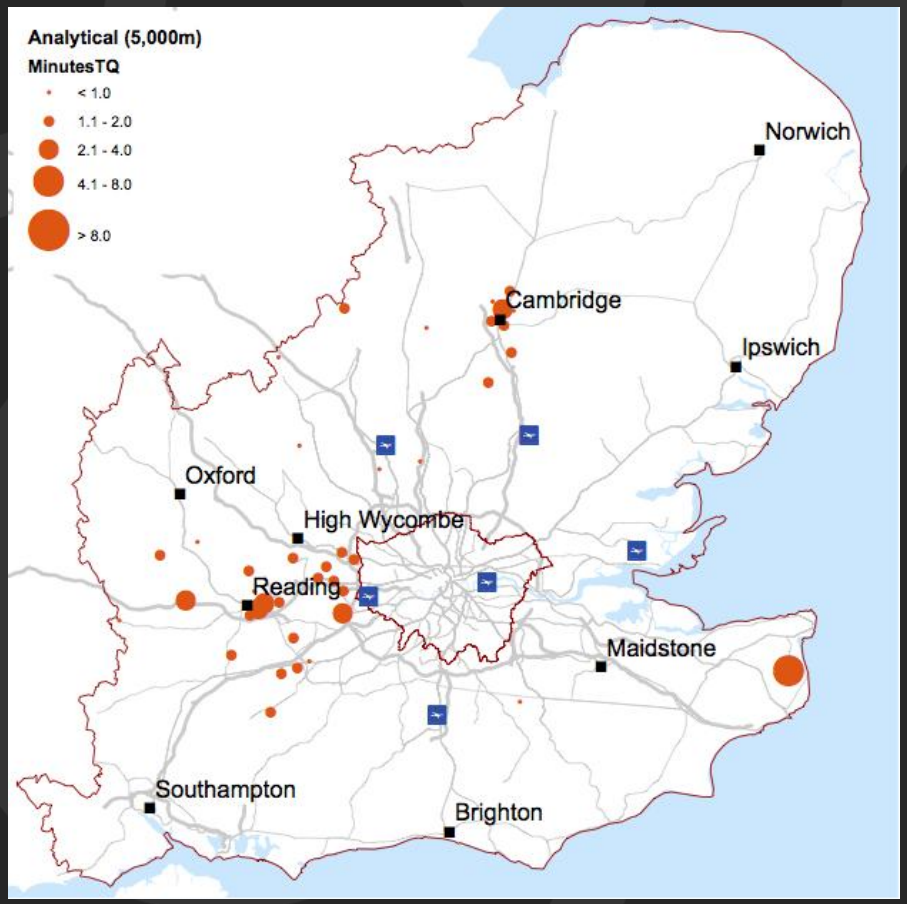


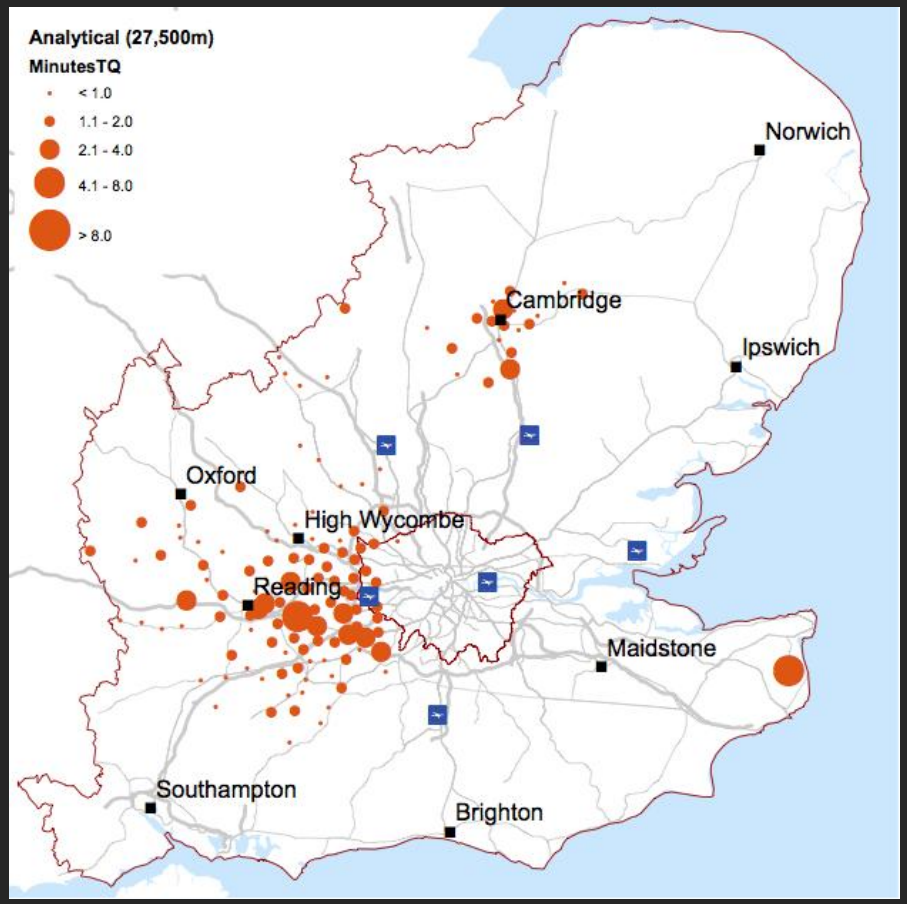
BPS GLOBALISATION





ANALYTICAL GLOBALISATION





MATERIAL FLOWS GLOBALISATION

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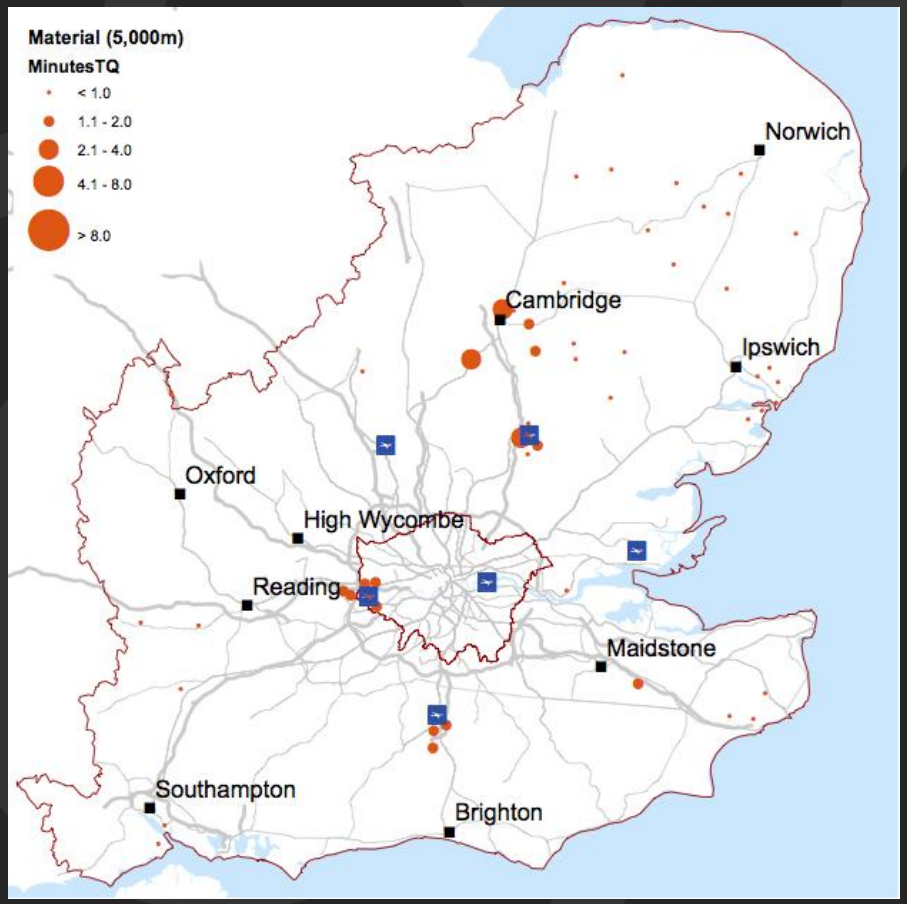
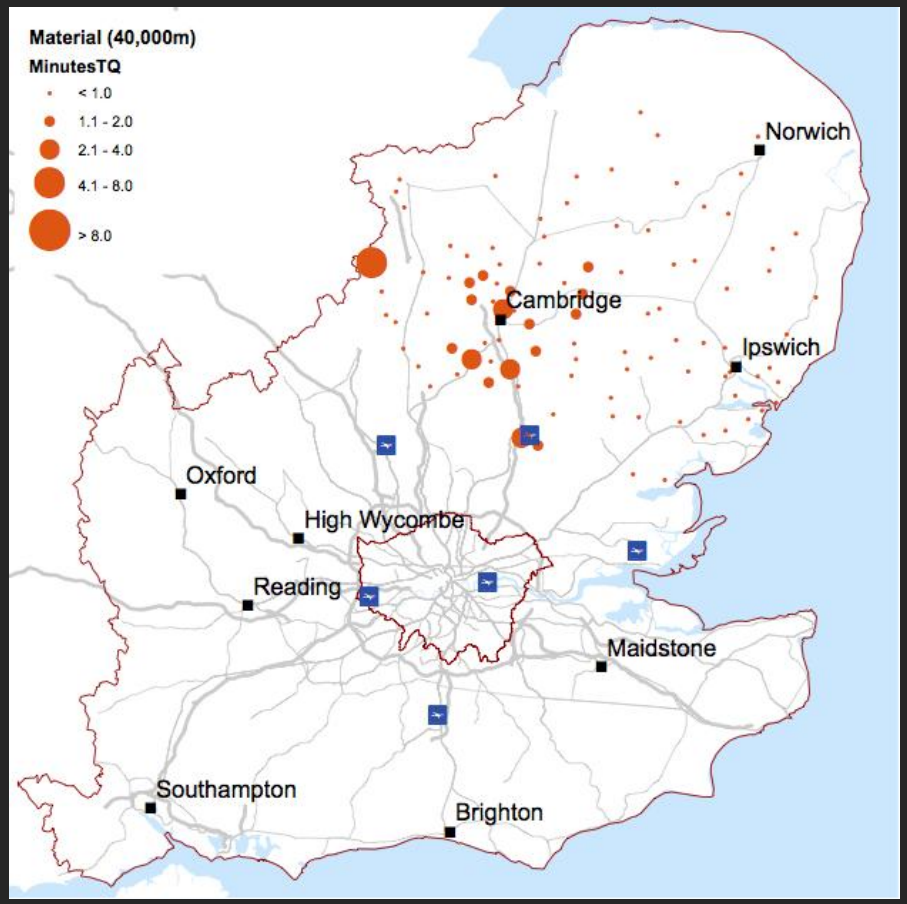




Sorry, I zoned out
in the middle there.

CONCLUSIONS

WRAPPING UP

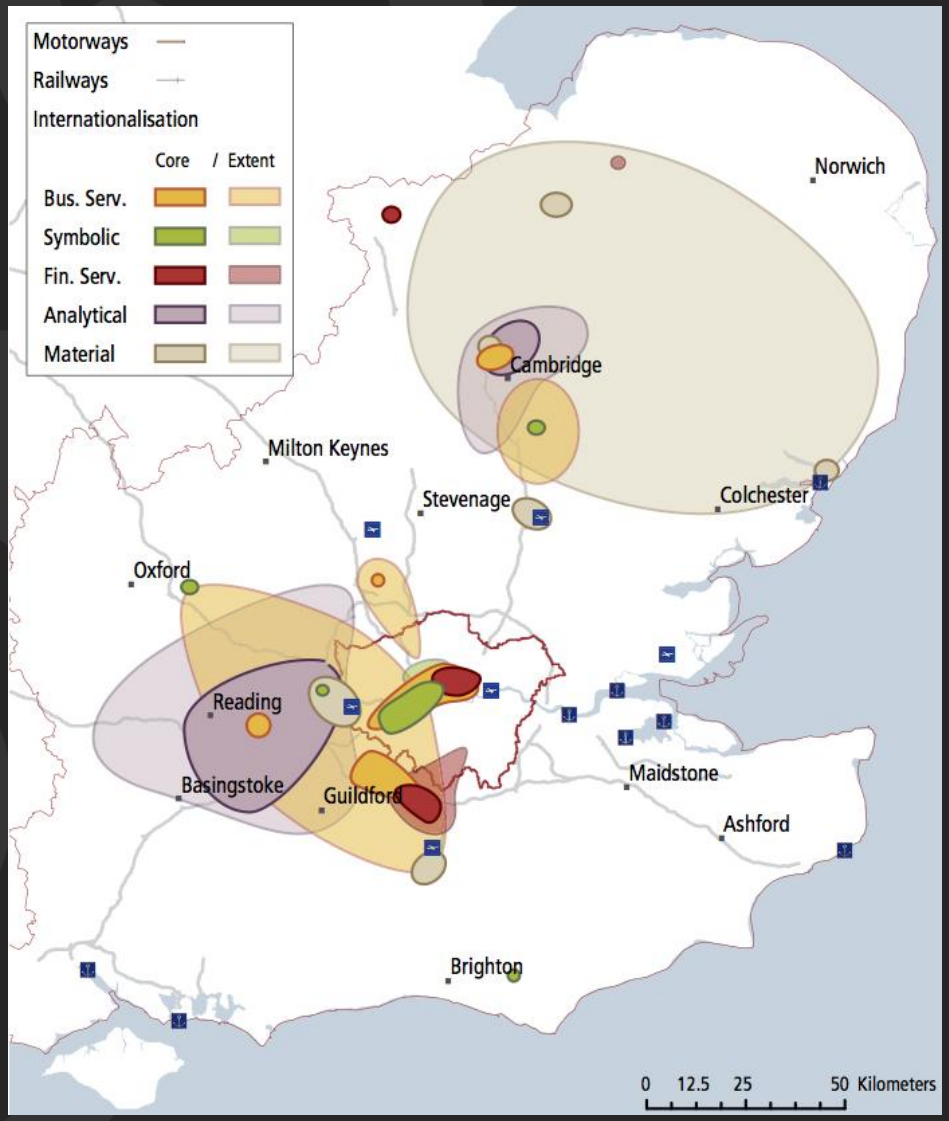
Some useful ‘takeaways’:

- All groups show some level of ‘back office’ activity—areas with significant calling activity that are geographically ‘detached’ from the urban core.
- Importance of the traditional CBD weakening for firms operating in codified environments with limited direct interaction needs.
- ICT is having differential effects on location at the sectoral level.

However:

- Results limited by absence of small businesses/contractors

PUTTING IT ALL TOGETHER



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THANK YOU!
(& APOLOGIES)

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http://www.reades.com/