Joint Programming Initiative Urban Europe
Project meeting, London, LSE, 9th May 2016

Resilient Cities:
Industrial Network and Institutional Perspectives

on Economic Growth and Well-being

LSE Team: outputs and progress

LSE

THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE

Work Package 1 (months 3-12)
Industrial diversification in European urban regions

Leader: Lund University

- Update and cleaning of FDi Market data 2003-2014 (Task 1.2)

- Papers on the role of MNEs and FDI in transforming the European geography and economy (see next WPs) can help integrate D1.3 and D1.4

Work Package 2 (months 8-24)
Institutions and regional diversification in Europe
Leader: Lund University

LSE contribution to RQ1 and & RQ3:

- integrated database on institutions in the EU28, at both national and regional level:
  - relationship between institutions and openness via international investment flows. Examples of output:

  Basile, Castellani & Crescenzi (see next slides)

  - relationship between openness via FDI and structural change in terms of sectoral composition of the national/regional industrial base. Example of output:

  Ascani & Iammarino (see next slides)

- LSE contribution to RQ4:
  - impact of openness on the resilience of different types of firms in terms of innovative performance in the case of the UK. Example of output:

  Gagliardi & Iammarino (see next slides)

Paper 1 - Quality of governance and inward FDI along the value chain: does within-country heterogeneity matter?
**Roberto Basile, Davide Castellani & Riccardo Crescenzi**

- This paper investigates:
  - to what extent regional diversity in the quality of governance can explain the regional distribution of FDI, both within and across countries
  - we consider different types of FDI, according to the main activity/stage of the value chain
- Research question:
  - Do different MNEs activities along the value chain exhibit different sensitiveness to within-country heterogeneity in QoG
    - e.g. Are production activities more sensitive to QoG than upstream and downstream activities (such as R&D and Service activities)?
- Data: fDi Market database: FDI over 2009-2013, using 2003-2008 as a control for persistence in FDI, data aggregated at the level of OECD TL2 level for EU countries (combination of NUTS1-2); CHARRON *et al.* (2014) data on QoG at both national and regional levels for 27 EU Member States

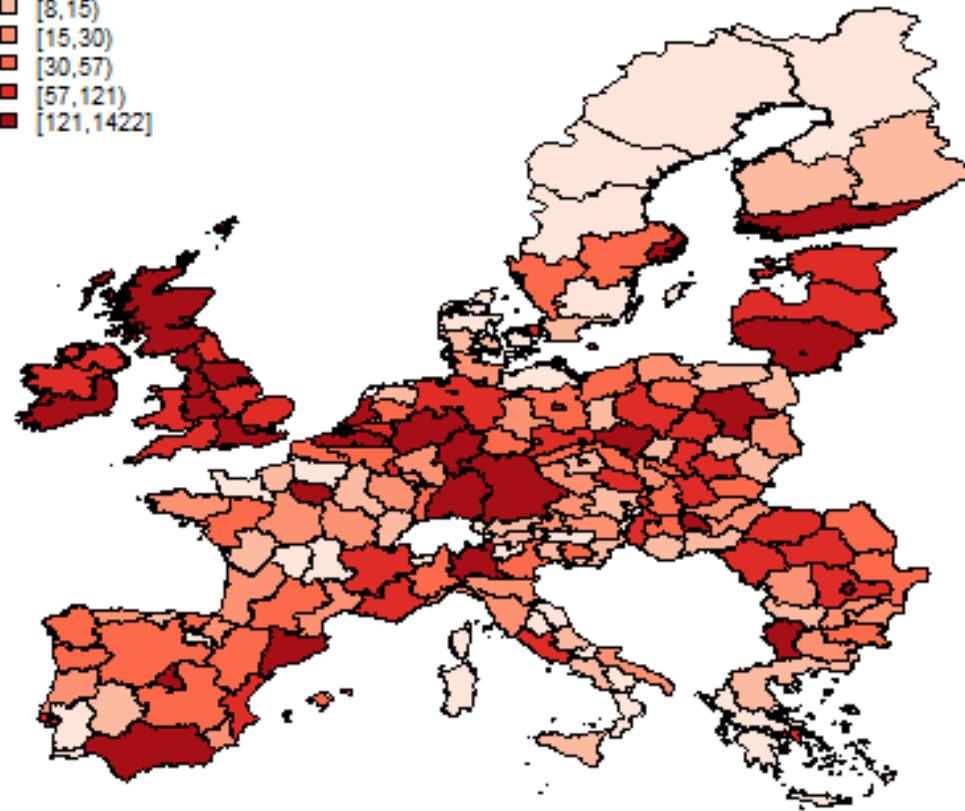# Paper 1 - Within-country heterogeneity in QoG and FDI

Quality of governance

[-2.879,-0.953)
[-0.953,-0.436)
[-0.436,0.188)
[0.188,0.741)
[0.741,1.082)
[1.082,1.75]
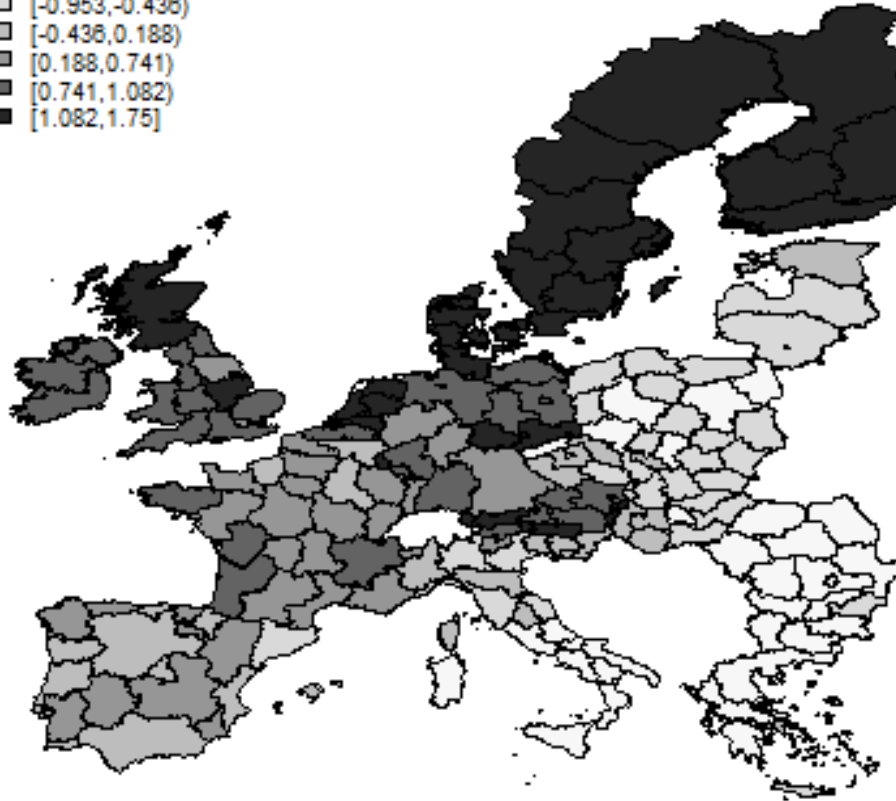
Number of inward FDI 2003-2013
Total

[0,8)
[8,15)
[15,30)
[30,57)
[57,121)
[121,1422]

Paper 1 – Some figures and Econometric model

Function	2003-2008	% of zeros	2009-2013	% of zeros
Production	26.4	3.8	15.1	9.1
Services	67.7	1.1	78.3	4.3
R&D and design	5.9	24.7	6.6	30.6
Total	100.0	0.0	100.0	2.1

- Generalized Linear Model (Negbin)
- Dep. Var.:
  - number of FDI projects over 2009-2013
  - Separate regressions for production, service, R&D+DDT,
- Main explanatory vars:
  - QoG index
- Other controls:
  - Same function FDI 2003-2008, Production FDI 2003-2008
  - Market potential, Population density, Wages, R&D intensity, Tertiary education, Unemployment rate
  - Country and region level QoG
  - Country fixed effects / Geoadditive model

Paper 1 – Main results

- Within-country heterogeneity in QoG matters to attract FDI in EU regions
- Activities along the value chain respond differently to regional QoG
  - Results on manufacturing activities are more robust
  - Service activities are attracted by good local QoG, but this seems to depend on the fact that they 'follow' production activities
  - There may also be some neighbouring country (or region) effect
- R&D and service activities are strongly affected by some local characteristics
  - R&D intensity (for R&D FDI)
  - Market size and tertiary education (for service FDI)

Paper 2 - Multinational Enterprises, Regions and Structural Change
Andrea Ascani & Simona Iammarino

- This paper investigates:
  - the linkages between internationalization through FDI and the structural change from manufacturing to services
  - Impact of FDI in manufacturing can go beyond the industrial macrosector
- Background:
  - Both domestic firms in services and foreign affiliates in general account for a large share of employment
  - Service employment rose from 43% to 59% in England from 1998 to 2007
  - Employment in foreign manufacturing firms increased from 22% to 48% in the same period
- Research question:
  - Do manufacturing MNEs contribute to the growth of the service sector?
- Data: Annual Respondent Database (ARD) from UK Office of National Statistics (ONS), panel 1997-2008 for manufacturing and service plants in England, information on employment of plants and other characteristics

Table 1: Domestic and foreign manufacturing plants in England 1997-2007

Region	Domestic		Foreign		Total
	n	%	n	%	n
South East	22,725	77.6	6,548	22.4	29,273
Eastern	4,214	78.8	1,133	21.2	5,347
London	7,786	77.6	2,247	22.4	10,033
South West	11,865	77.8	3,386	22.2	15,251
West Midlands	9,869	79.4	2,564	20.6	12,433
East Midlands	10,509	79.8	2,668	20.2	13,177
Yorkshire/Humberside.	10,623	76.5	3,272	23.5	13,895
Merseyside	4,244	71.1	1,725	28.9	5,969
North West	6,165	75.1	2,048	24.9	8,213
North East	11,149	79.5	2,876	20.5	14,025
Total	99,149	77.7	28,467	22.3	127,616

Note: foreign and domestic plants are defined based on the nationality of the ultimate owner.

Table 2: Share of foreign employment in manufacturing by region

Region	1997	2007
South East	0.50	0.53
Eastern	0.36	0.44
London	0.46	0.51
South West	0.47	0.50
West Midlands	0.37	0.43
East Midlands	0.34	0.49
Yorkshire/Humberside	0.44	0.33
Merseyside	0.50	0.58
North West	0.53	0.60
North East	0.48	0.43

Note: foreign and domestic plants are defined based on the nationality of the ultimate owner.

Paper 2 – FDI and regions: some descriptives

Paper 2 – Econometric model

Plant-level OLS estimation of foreign premium over domestic owned plants [similar to Bernard et al. (2007) for exporters and Almeida (2007) and Ascani (2015) for MNEs]

$$S_{it} = \alpha + \beta_1 Foreign_{it} + X'_{it}\beta_2 + \delta_t + \sigma_j + \varepsilon_{it}$$

Where:

i: plant

t: time

j: manufacturing industry (SIC92)

S: log of purchase of services

Foreign: dummy for foreign-owned plant

X': vector of controls (ln employment, ln capital per employee, ln imports of services, service producer)

β_1 is the average difference in outcome S between foreign affiliates and domestically-owned companies (in the same year, industry, region)

Paper 2 – Main results

- Evidence that foreign affiliates in manufacturing buy between 28% and 14% more services than domestic firms (transport and advertisement respectively) in the same year, industry and region

- Hence, it is likely that attracting FDI in manufacturing also benefit the service sector through higher demand for services as intermediates (forward linkages)

- However, this seems to strengthen geographical polarization of economic activities across regions

Paper 2 – Extensions: Multiplicative effects of FDI

$$\Delta S_{rt}^{tot} = \gamma_0 + \gamma_1 \Delta M_{rt}^{foreign} + \gamma_2 \Delta M_{rt}^{domestic} + \delta_t + u_{rt}$$

Where

r: region

t: time

S: employment in services

M: employment in manufacturing

- Approach similar to Moretti (2010) and Faggio and Overman (2014)

Preliminary findings:

- A 10% increase in the number of manufacturing jobs created by MNEs is associated with a 1.73% increase in employment in the service sector (column 2). This is only a correlation so far (with no controls). IV strategy currently work-in-progress

Paper 3 - Innovation in uncertain market conditions. Multinational versus domestic firms in the UK regions
Luisa Gagliardi & Simona Iammarino

- This paper investigates:
  - The perceived obstacles that domestic firms face in engaging in innovation activities with respect to MNEs

- Research question:
  - whether domestic enterprises are more discouraged than MNEs by the perceived economic risks associated to the development of innovative projects when deciding whether to engage in innovation activities
  - whether firms become more risk adverse in periods of economic crisis, and whether they react differently in more dynamic regions than in others characterised by more traditional industrial structures

- Data: micro data coming from UK Innovation Survey (UK-CIS); balanced panel provided by the UK Office of National Statistics (ONS) and constructed by merging three waves of the UKIS to cover the period 2002-2008. The sample includes 4050 businesses participating as respondent in all three consecutive waves (64% is part of a UK-based Multinational enterprise group, the remaining sample is based on domestic businesses)

Paper 3 – Firms' innovative activities
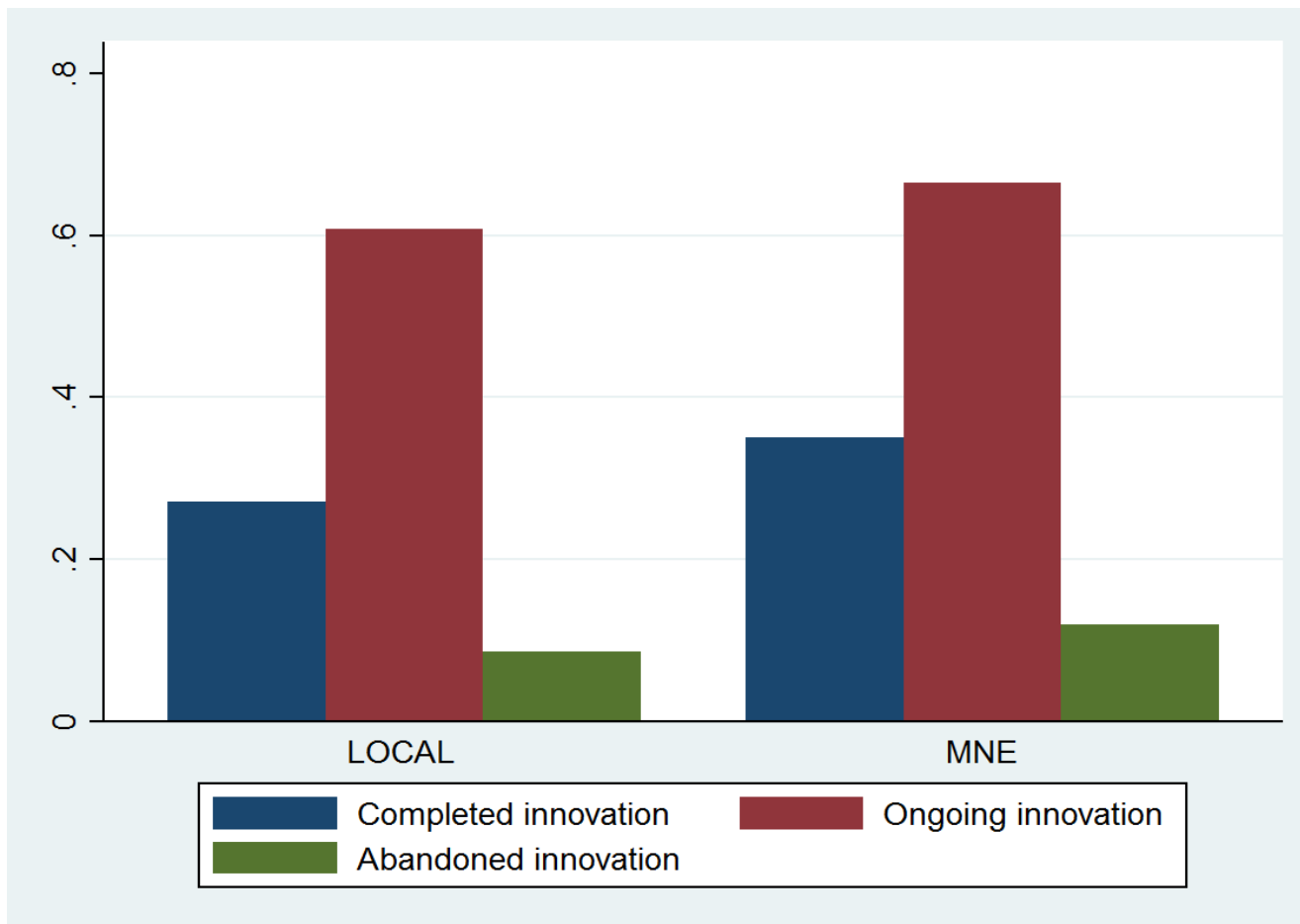
Paper 3 – Econometric model

Analysis based on a two ways panel data estimation approach that allows to include both time and firm level dummies. The estimation equation takes the following form:

$$Innovation\ active{\downarrow}it = \alpha{\downarrow}i + \delta{\downarrow}t + \beta{\downarrow}1\ Market\ uncertainty{\downarrow}it + \beta X{\downarrow}it + \varepsilon{\downarrow}it$$

Where:

$Innovation\ active{\downarrow}it$ is a dummy that takes value 1 if the firm is innovation active and 0 otherwise

$Market\ uncertainty{\downarrow}it$ is a dummy taking value 1 if a firm ranked as medium or high the role of market risk and uncertain demand conditions as key obstacle to innovation

$X{\downarrow}it$ is a vector of firm level controls including the number of skilled employees and the degree of export orientation

$\alpha{\downarrow}i$ and $\delta{\downarrow}t$ are region and time fixed effects respectively

$\varepsilon{\downarrow}it$ is a well behaving error term

By adopting a two ways panel estimation approach we identify the role market uncertainty exploiting the within firm variation in innovative behaviors

Paper 3 – Main results

- High levels of uncertainty are positively associated with the probability to engage in innovation activities. High perceived uncertainty strongly correlated with both the development of significantly new innovations and the related share of turnover. Firms may therefore have incentives to exploit the opportunities coming from the development of ambitious and risky projects.

- Effect of uncertainty on the probability of firm innovation is significantly different when comparing domestic firms with MNEs. Whereas in the case of the latter positive effects prevail, domestic firms seem to be more risk adverse and to self-select themselves in projects where uncertainty and perceived risks are lower

- Again, strong regional cumulative causation mechanisms at work

Other papers related to Work Package 2

- **Austerity and the slow recovery of European City-Regions:** Riccardo Crescenzi, Davide Luca and Simona Milio

Paper aims at: exploring the links between post-2008 economic performance and pre-crisis factors (including macro-economic conditions) that may have exacerbated (mitigated) the short-term contraction of European city-regions

- **Demographic change and skill composition in German regions**: Paula Prenzel and Simona Iammarino

Paper aims at: analysing the link between regional demographic structure and labour force skill composition in the period 1995-2010 for districts in Germany and investigating the consequences for regional disparities

- **Barriers to innovation during the crisis. The case of the Friuli Venezia Giulia region**: Simona Iammarino, Tiziana Sodano & Giovanni Vittorino

Paper aims at: empirically assessing the relationship between the intensity of firms' engagement in innovative activities and self-reported obstacles to innovation during the unfolding of the recent economic and financial downturns

Work Package 4 (months 10-24)
Economic networks and regional resilience
Leader: LSE

- LSE contribution to RQ3 (with likely spillovers on RQ2):
  - Analysis of the characteristics of MNE networks (Foreign Investments) between cities and regions in the EU28. Examples of output:

  Crescenzi , Datu and Iammarino (see next slides)
  - Analysis of the features of city-level networks generated by Foreign Investments in different SECTORS and FUNCTIONS. Examples of output:

  Crescenzi & Iammarino (see next slides)
  - Analysis of the relationship between the position of EU cities/ regions in the MNE networks and indicators of regional resilience (e.g. diversification, innovation, skills, etc.)

  Comotti, Crescenzi & Iammarino (in progress)

Paper 1 - European Cities and Foreign Investment Networks
Riccardo Crescenzi, Kerwin Datu & Simona Iammarino

- This paper aims at:
    - Investigating the position of European cities in the continental networks formed by inflows and outflows of greenfield and brownfield Foreign Direct Investment (FDI) among the EU countries, candidate countries and EU Neighbouring countries involved in the process of economic integration to different extents and degrees
    - identifying hierarchical patterns of relations between different types of locations, and gaining a finer-scaled appreciation of sectoral and functional investment location patterns in different regions within Europe, with a particular focus on interperipheral ties
- Data: *fDi Markets* database: geography of FDI flows between a set of 3,500 cities and towns within the European Union (EU) Member States and their neighbourhood in the period 2003-08

Paper 1 – Methodology

- The identification of *topologically viable* networks, as well as the identification of the position of each location within the hierarchy of locations comprising each network, was achieved using an analysis of the *degeneracy* of each network

- The analysis centres on the calculation of the "*k*-shell decomposition" of each network according to the algorithm developed by Seidman (1983)

- Any network is decomposed into several layers, numbered from the periphery to the core like the layers of an onion, each of which called a "*k*-shell"

- The number *k* of any *k*-shell identifies the minimum number of connections to other locations within that *k*-shell accruing to every location within that *k*-shell, regardless of the number of connections to peripheral locations outside that *k*-shell

Paper 1 – Main results

- In line with the classic literature on MNEs, the paper identifies hierarchical patterns of relations between different types of locations, and gain a finer-scaled appreciation of sectoral and functional specialisations of different regions within Europe and the neighbourhood

- The paper proposes a speculative taxonomy of Europe's leading investment cities:

  – *Europe's investment capitals*

  Paris and **London.** Surrounded by a number of other highly multisectoral and multifunctional cities throughout the EU15, including Amsterdam, Dublin, Helsinki, Madrid, Munich, Stockholm and Vienna.

  – *Europe's second pole*

  Paris and London are followed closely in importance by **Moscow**.

  – *Europe's intermediaries*

  Bucharest, **Budapest, St Petersburg**, **Sofia** and **Prague** And below Prague are **Kyiv**, **Warsaw**, **Tallinn** and **Istanbul**.

Paper 2 - Global Investments and Regional Development: the Missing Links
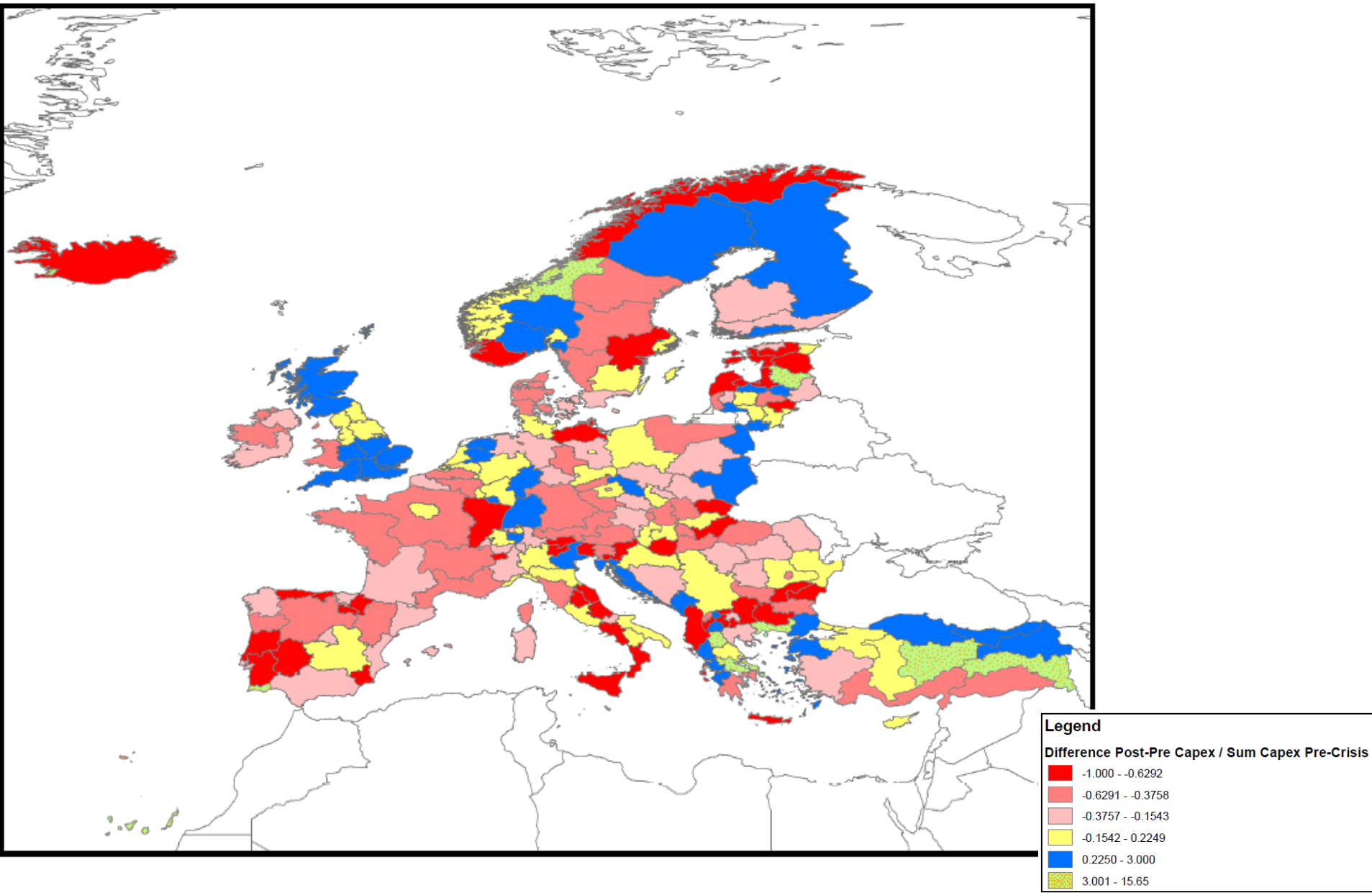## Riccardo Crescenzi & Simona Iammarino

This paper aims at:

- assessing how openness and global connectivity through global investment flows can shape regional economic development

- discussing some threats and opportunities for cross-fertilisation between regional studies, economic geography and international business , and driving implications for future scholarly and policy thinking

- providing descriptive evidence of the geography of foreign investment in and from the European Union in the period 2003-2014, attempting a dynamic classification of subnational regions in terms of connectivity measured by such flows
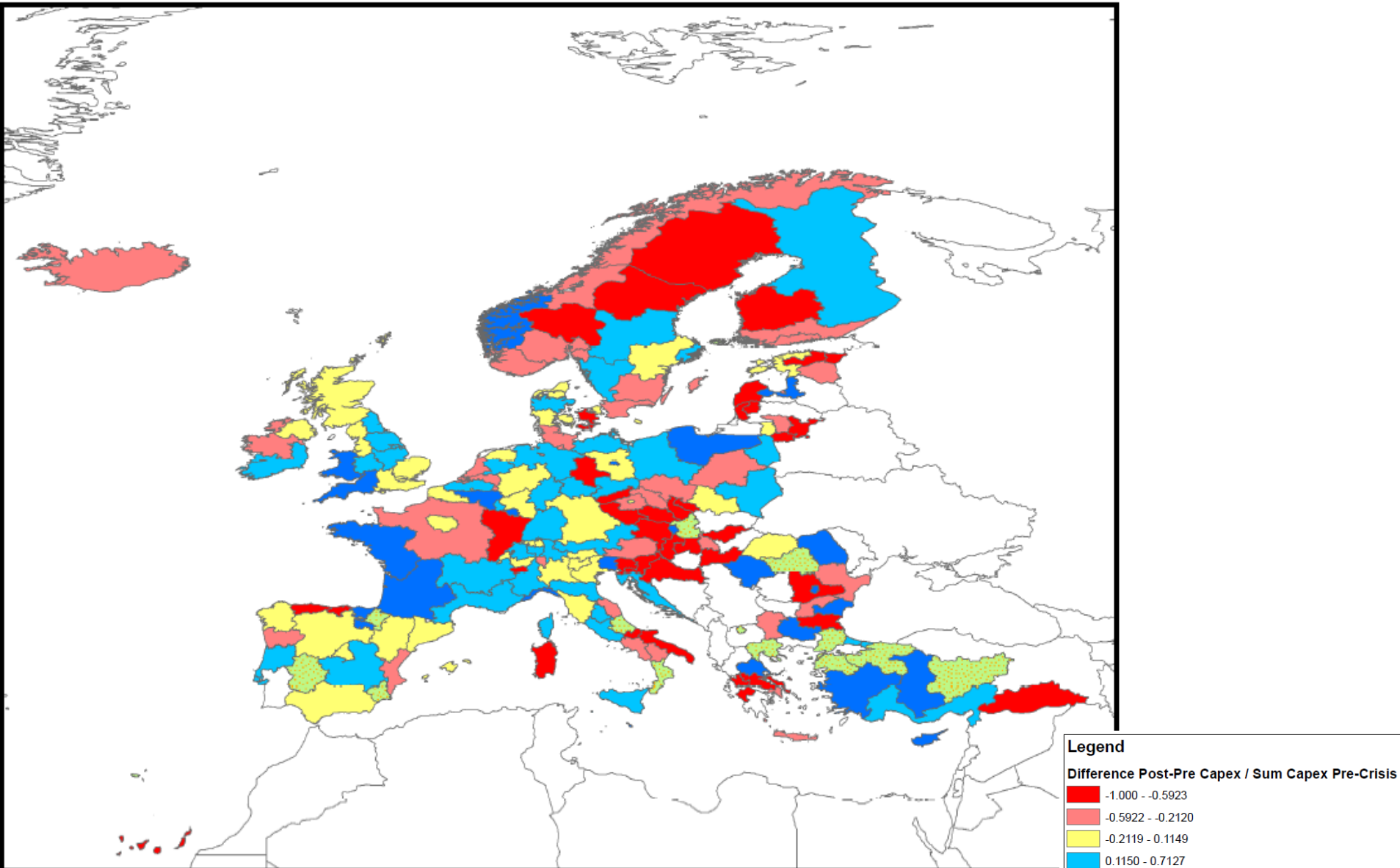
Paper 2 – Some descriptive figures

	Tabella 1 [CAPEX - Core - Periphery - Extra Europe] - Shares								
	from CORE			*from* PERIPHERY			*from* EXTRA-Europe		
	PRE-CRISIS	POST-CRISIS	Growth Rate	PRE-CRISIS	POST-CRISIS	Growth Rate	PRE-CRISIS	POST-CRISIS	Growth Rate
to CORE	20%	18%	-16%	19%	13%	-32%	72%	79%	1%
to PERIPHERY	12%	9%	-31%	28%	16%	-43%	28%	21%	-34%
to EXTRA-Europe	68%	74%	2%	53%	71%	34%	-	-	-

Paper 2 – Regions on the move – Europe as a Destination for Global FDI (Change in Capex after Crisis)

Legend

Difference Post-Pre Capex / Sum Capex Pre-Crisis

🟥	-1.000 - -0.6292
🟥	-0.6291 - -0.3758
🟧	-0.3757 - -0.1543
🟨	-0.1542 - 0.2249
🟦	0.2250 - 3.000
🟨	3.001 - 15.65

Paper 2 – Regions on the move – Europe as a Source of FDI
(Change in Capex after Crisis)

Legend

Difference Post-Pre Capex / Sum Capex Pre-Crisis

- -1.000 - -0.5923
- -0.5922 - -0.2120
- -0.2119 - 0.1149
- 0.1150 - 0.7127
- 0.7128 - 3.000
- 3.001 - 31.22

Work Package 5 (months 25-34)
Synthesis and formulation of policy recommendations
Leader: Utrecht University

- LSE contribute to RQ3:

designing, carrying out and analysing one of the three sets of case studies on economic, social and institutional heterogeneity among EU cities and regions, with specific reference to the UK. The case-study is based on the selection of 1 **high** resilience region and 1 **low** resilience region, chosen on the basis of the results of the previous WPs.