Agglomeration, Accessibility, or Amenities? Seeking (Desperately?) for the Latent Engine of Regional Growth

Dr. Luca Salvati

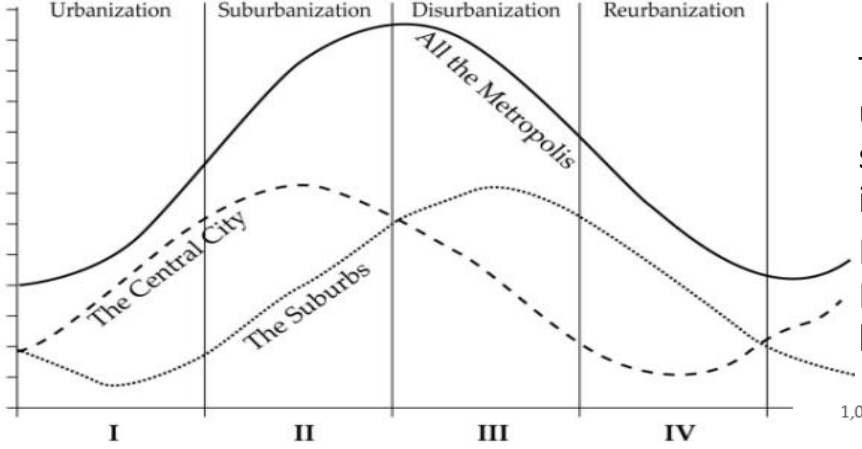
Assumptions

- High regional variability in the spatial distribution of resident population and across-country density divides have consolidated heterogeneous demographic patterns at the base of modern regional/urban systems in Europe.

Economic (agglomeration, accessibility, amenities), historical, institutional, and cultural forces have demonstrated to affect the spatial distribution of resident population, influencing regional growth.

At the same time, path-dependence and density-dependence are mechanisms persistently shaping demographic dynamics at both local and regional scale.

Empirical investigation estimating the role of economic/non-economic drivers of population growth along different economic phases demands further efforts for Mediterranean countries – despite a long settlement history.



The relationship between economic downturns, urban/metropolitan cycles, demographic transitions and social change is particularly complex and hardly predictable in some cases;

Path-dependent history of local/development prevails in a European continent "(…) of sticky people and implicit boundaries". P Cheshire, S Magrini (2009)

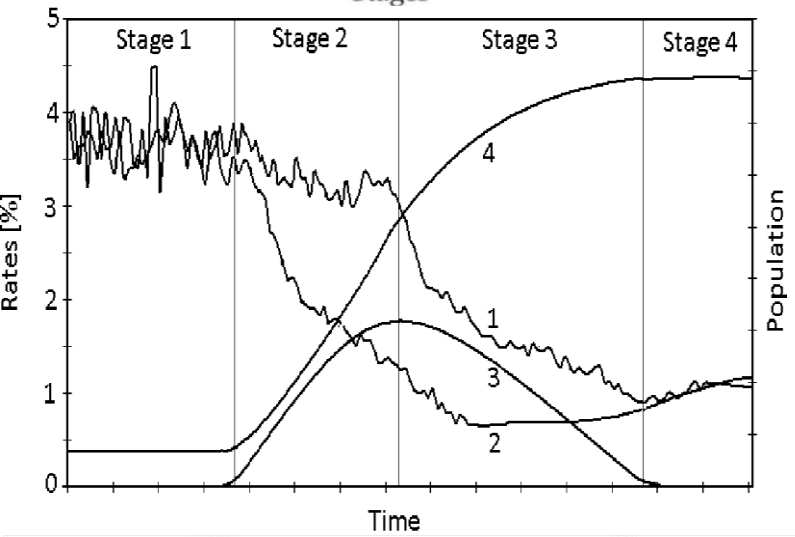
Bocquier, Dyson, Matthews (demography)

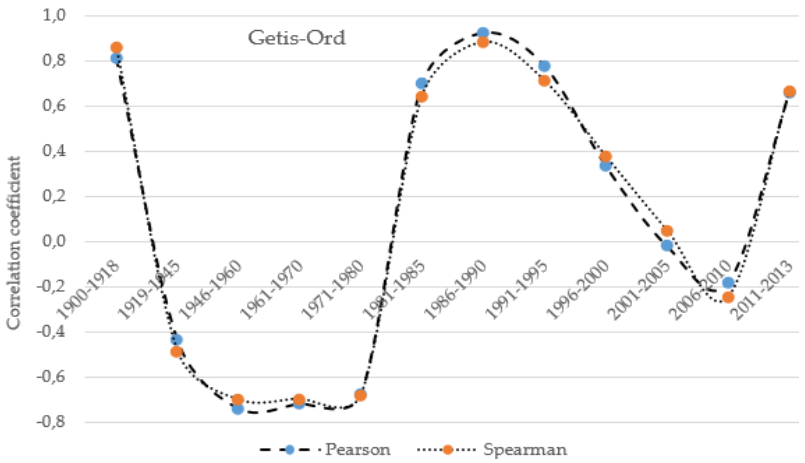
New economic geography & related variety

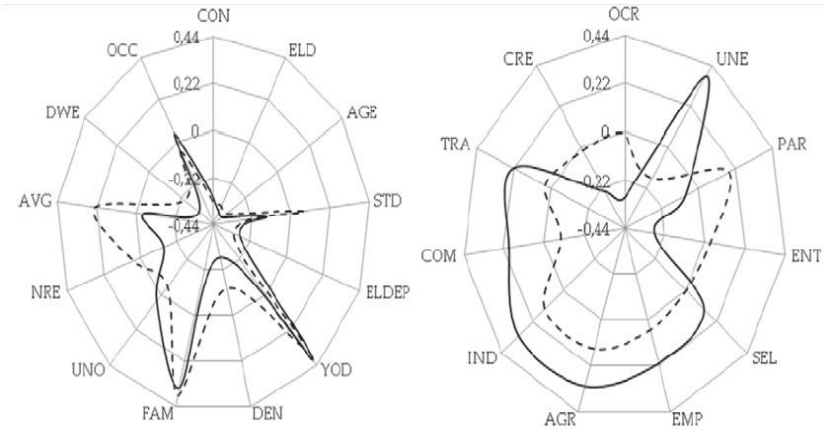
Polycentrism

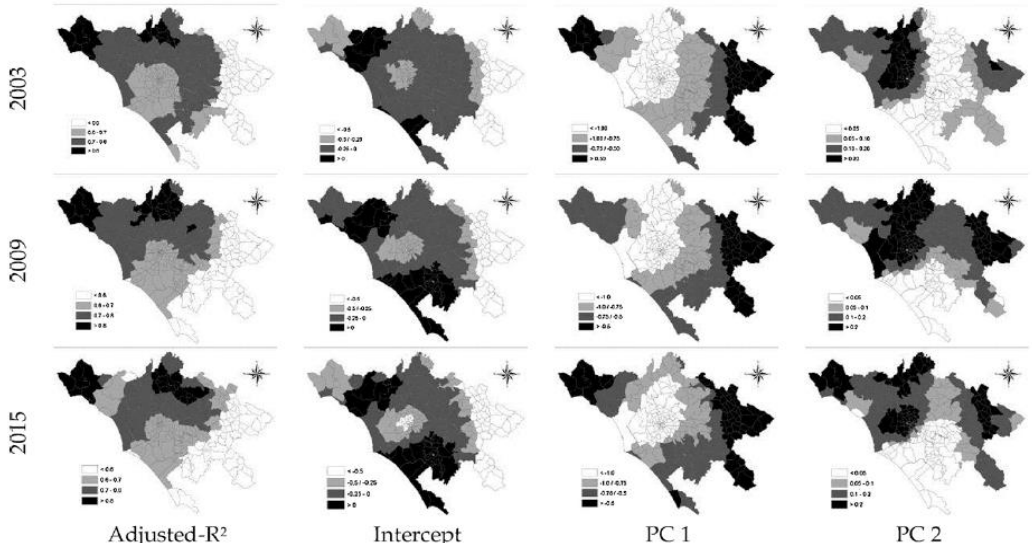
Regional science

'Fractal' urban growth (Pumain)









Identifying population growth drivers during economic expansion and recession waves

1

Greece, 2002-2009 & 2010-2017, **population growth** & density, ancillary variables, prefectural scale

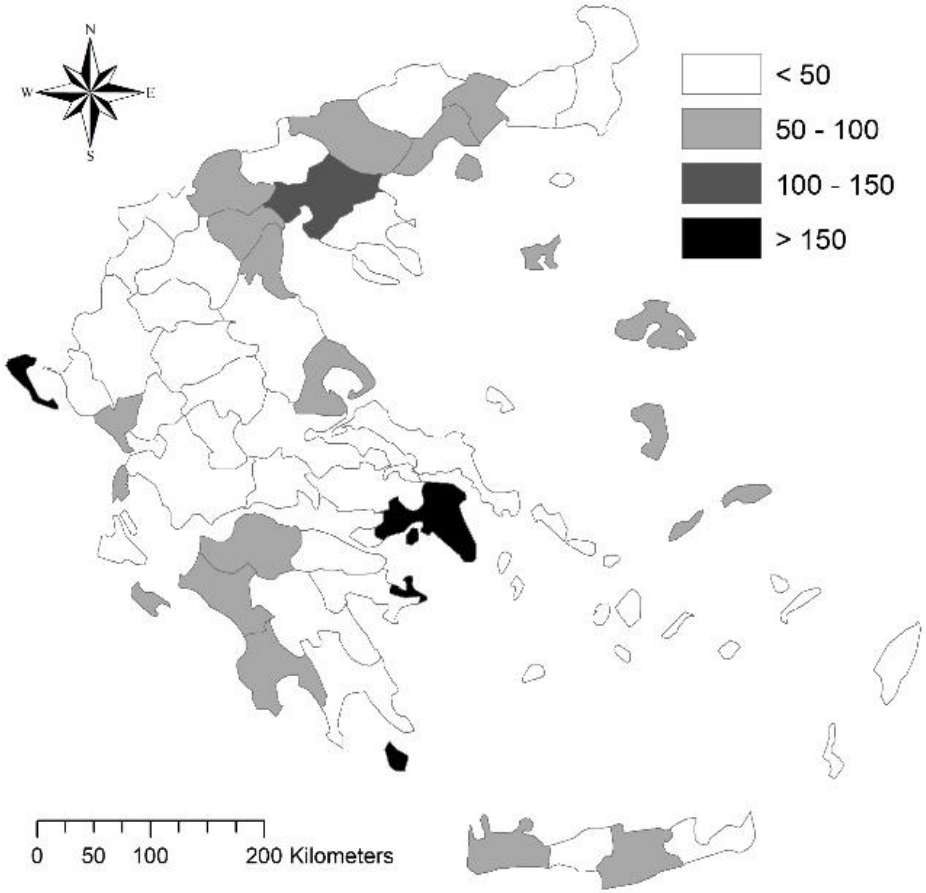
2

Spatial econometric approach (panel), global and local dimensions (to be developed)

3

Models' results (goodness-of-fit, regr.coefficients, interpreted against time/contextual variables

Study area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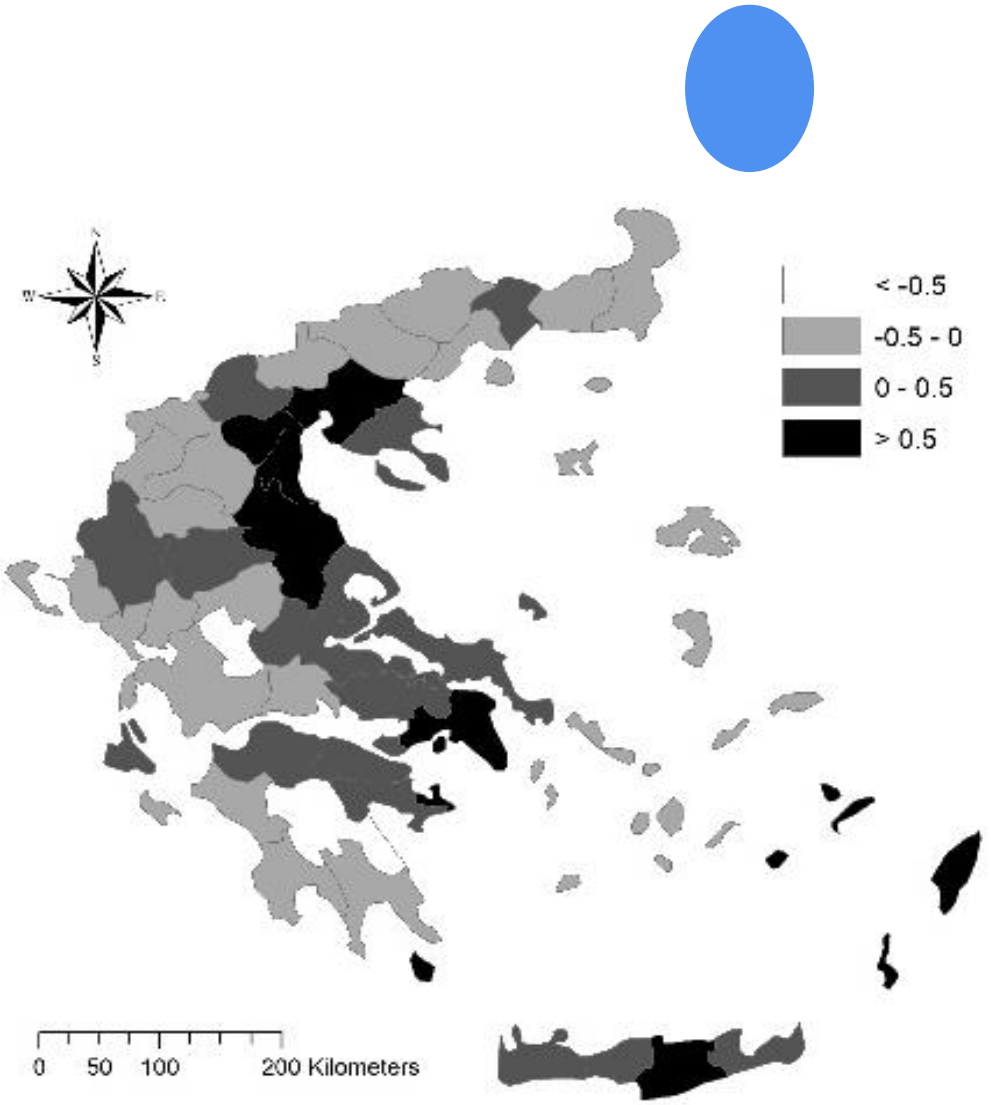
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List of variables

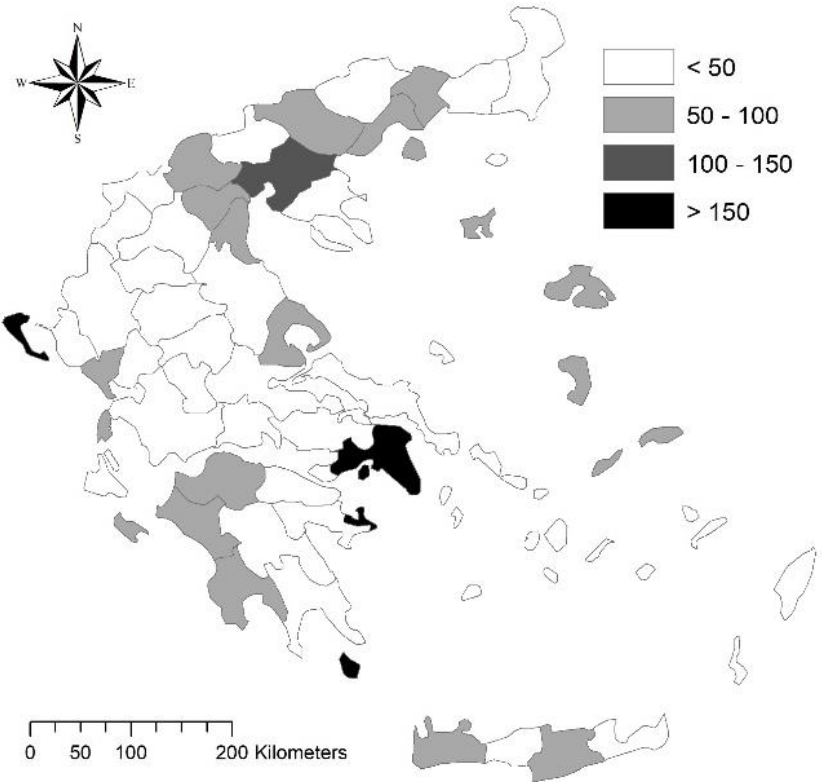
Acronym	Description	Data source
Pop	Population growth rate (per cent by year), response variable	Vital statistics, ELSTAT
DistAth	Distance from Athens (km)	Territorial statistics, ELSTAT
DistSal	Distance from Thessaloniki (km)	Territorial statistics, ELSTAT
Inc	Per-capita added value (purchasing power parity, logarithm values in Euros)	National accounting, ELSTAT
Gro	Growth rate of prefectural value added, purchasing power parity (%)	National accounting, ELSTAT
Agr	Share of agriculture value added in total value added (%)	National accounting, ELSTAT
Ind	Industry to services value added ratio	National accounting, ELSTAT
Con	Share of construction's value added in total value added (%)	National accounting, ELSTAT
Inf	Share of informatics and finance value added in total value added (%)	National accounting, ELSTAT
Bir	Gross birth rate	Vital statistics, ELSTAT
Highway	Presence of a national highway (dummy)	Territorial statistics, ELSTAT
DistSea	Proximity to the sea coast (dummy: < 10 km: 1; > 10 km: 0)	Territorial statistics, ELSTAT
IntAirp	Presence of an international airport (dummy)	Territorial statistics, ELSTAT
Univer	Presence of a public university (dummy)	Territorial statistics, ELSTAT
Tourism	Tourism location (dummy)	Territorial statistics, ELSTAT
Cli	Climate quality (score)	European Environment Ager
For	Forests in total landscape, based on Corine land cover 3.1 class (%)	European Environment Ager
Spr	Dispersed settlements (Corine code 1.1.2) in total landscape (%)	European Environment Ager
Cul	Prefecture with > 5 museums and/or archaeological sites (dummy)	Cultural statistics, ELSTAT
Hou	House cost (dummy: > Greek average: 1; < Greek average: 0)	Building permits, ELSTAT
Une	Total unemployment index (dummy: > Greek average: 1; < Greek average: 0)	Social statistics, ELSTAT
UnF	Female unemployment index (dummy: > Greek average: 1; < Greek average: 0)	Social statistics, ELSTAT

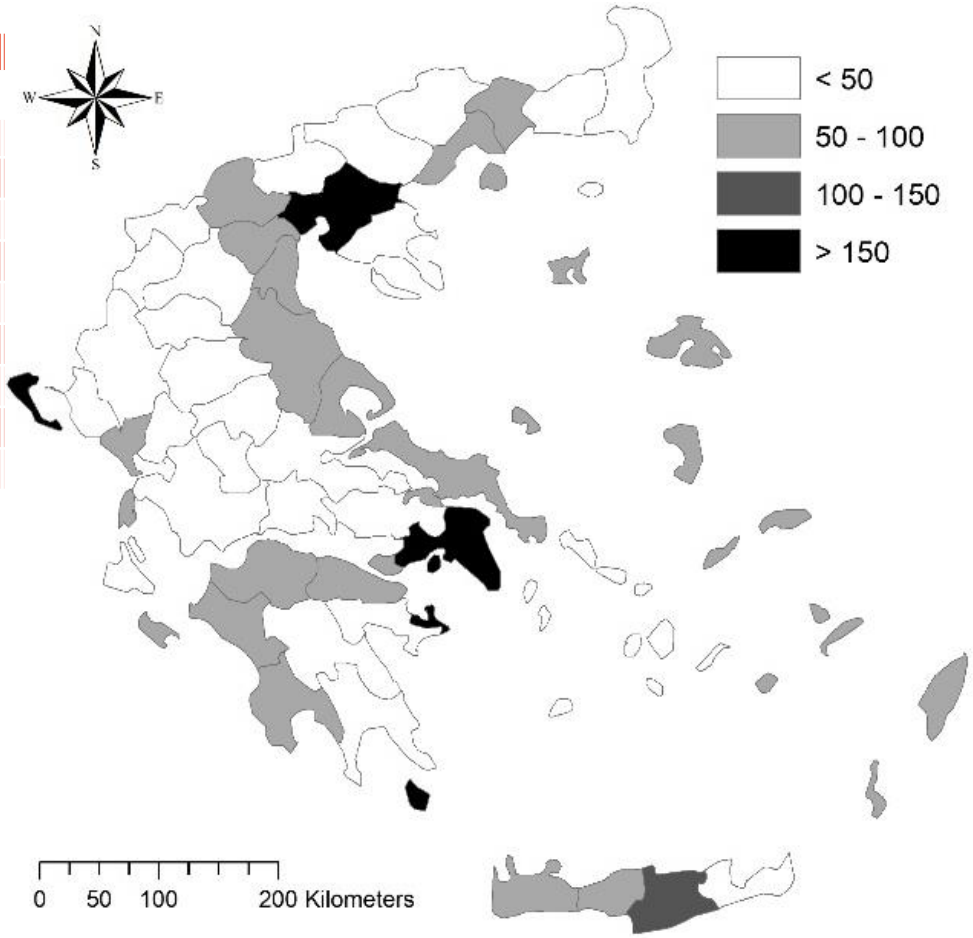
The results of spatial models testing the significance of predictors of population growth (per cent annual rate) using Spatial Autoregressive Model (SAR), Spatial Autocorrelation Model (SAC), and Spatial Durbin Model (SDM) with n = 408 observations (***, **, * significance tested at $p < 0.001$, $0.001 < p < 0.05$, $p < 0.5$).

	Recession (2010-2017)			Expansion (2002-2009)		
Variable	SAR	SAC	SDM	SAR	SAC	SDM
Distance from capital city	0.247(0.121)*	0.251(0.122)*	0.457(0.195)*	0.025(0.129)	0.0158(0.130)	-0.231(0.176)
Income, per-capita	-0.062(0.035)*	-0.061(0.035)*	-0.066(0.036)*	-0.041(0.029)	-0.042(0.029)	-0.050(0.030)
Agricultural value added	-0.023(0.101)	-0.027(0.101)	0.026(0.115)	-0.256(0.099)**	-0.258(0.099)**	-0.216(0.115)*
Finance,RD value added	-0.187(0.098)*	-0.195(0.098)*	-0.103(0.013)*	-0.122(0.104)	-0.125(0.104)	-0.243(0.139)
Crude birth rate	0.218(0.095)*	0.212(0.095)*	0.282(0.103)**	0.622(0.077)***	0.624(0.077)***	0.626(0.081)***
Highway	0.173(0.102)*	0.175(0.102)*	0.290(0.142)*	0.257(0.093)**	0.256(0.093)**	0.502(0.153)***
Proximity to sea coast	0.269(0.109)**	0.270(0.109)**	0.403(0.132)**	0.073(0.097)	0.071(0.097)	0.142(0.128)
International Airport	-0.121(0.123)	-0.123(0.123)	-0.591(0.261)	-0.191(0.119)	-0.191(0.119)	-0.495(0.218)*
Tourism speciaization	0.239(0.136)*	0.239(0.136)*	0.305(0.158)*	0.215(0.118)	0.211(0.118)	0.184(0.145)
Climate quality	0.352(0.136)**	0.356(0.136)**	0.074(0.018)*	-0.010(0.126)	-0.017(0.126)	-0.008(0.173)
Urban sprawl	-0.075(0.114)	-0.076(0.114)	-0.177(0.145)	-0.181(0.104)*	-0.182(0.105)*	-0.239(0.128)*
Museums/arch.sites	0.118 (0.098)	0.119(0.098)	0.166(0.113)	0.197(0.093)*	0.197(0.092)*	0.445(0.113)***
Unemployment	-0.064 (0.091)	-0.065(0.091)	-0.077(0.088)	-0.153(0.081)*	-0.153(0.081)*	-0.158(0.088)*
Constant	0.015(0.073)	0.011(0.078)	-0.218(0.168)	-0.002(0.066)	0.002(0.066)	0.096(0.153)
Pseudo-R^2	0.394	0.394	0.494	0.499	0.500	0.586

Spillover effects of spatial regression analysis (SDM) with n = 408 observations (***, **, * significance tested at $p < 0.001$, $p < 0.01$, $p < 0.1$), by time interval.

Predictor	2002-2009	2010-2017
Per-capita income	-0.237(0.822)	-1.961(0.774)**
Crude birth rate	1.820(0.652)**	1.090(0.839)
Highway	3.645(1.92)*	0.472(1.768)
Climate quality	-4.419(1.887)*	-3.516(2.972)
Urban sprawl	-2.759(1.578)*	-0.949(1.893)
Unemployment rate	2.833(1.164)**	2.166(1.572)
Wald test of spatial terms	$chi^2_{(20)} = 33.30$*	$chi^2_{(20)} = 40.21$**
Global Moran index	-0.007	0.022
LM Error (Burridge)	0.163*	1.735*





Some concluding remarks:

- Preliminary results highlight a highly differentiated impact of predictors on population growth over time.

- Impact of scale & accessibility factors is significant with economic expansion, delineating a 'classical' model of growth based on 'agglomeration' economies.

- Impact of non-economic factors – including but not limited to amenities – is more evident with recession.

- The spatial model observed during recession has instead reflected the inherent decline of agglomeration economies – with population increasing in accessible, rural districts with (natural and cultural) amenities.

In more recent years, population growth in low-density coastal areas definitely suggests how demographic trends have been decoupled from the geography of income and wealth, lowering the divide in central and peripheral locations.

- The progressive shift toward settlement models based on population growth in 'intermediate towns' and attractive/accessible rural locations delineates a development path grounded on the spatial distribution of amenities, suggesting the existence of a 'reverse density dividend' that requires a specific investigation in advanced economies.

Future developments

1

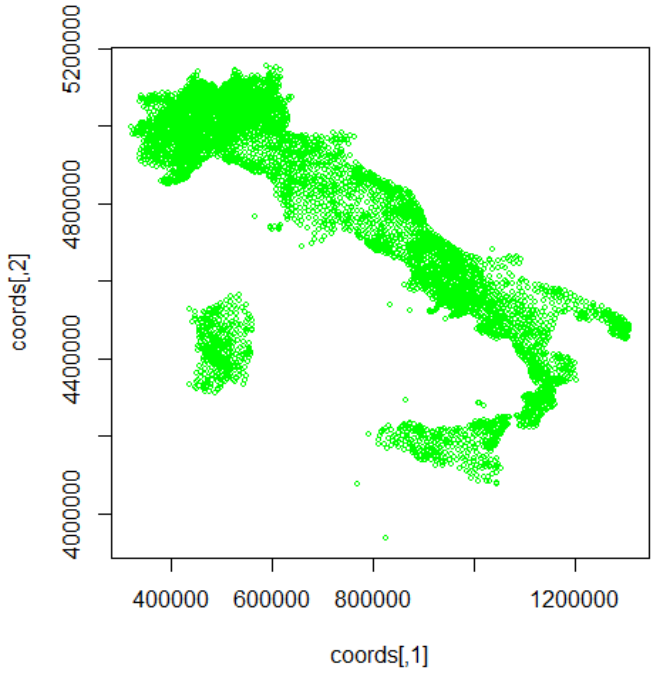
Italy, 1861-2021, **population growth** & density, ancillary variables, municipal scale (n = 8101)

2

Spatial econometric approach (cross-section & panel), global and local dimensions

3

Models' results (goodness-of-fit, regr.coefficients, interpreted against time/contextual variables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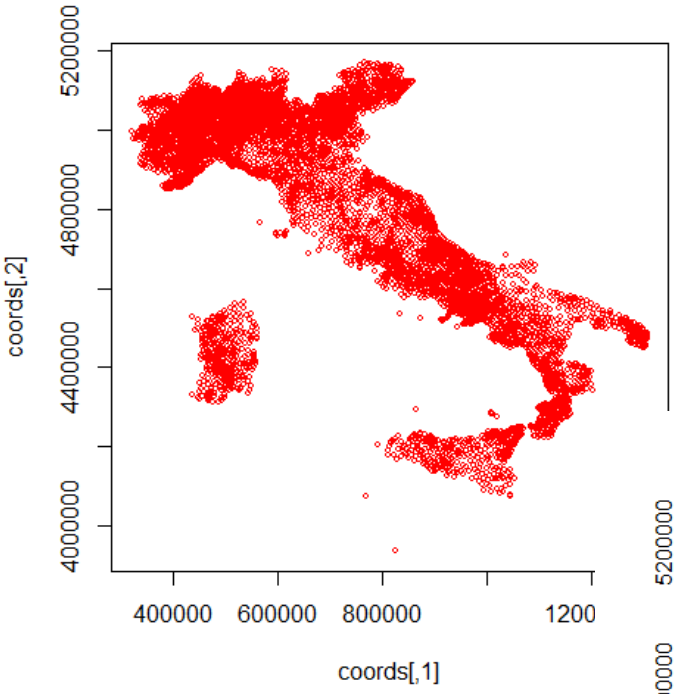
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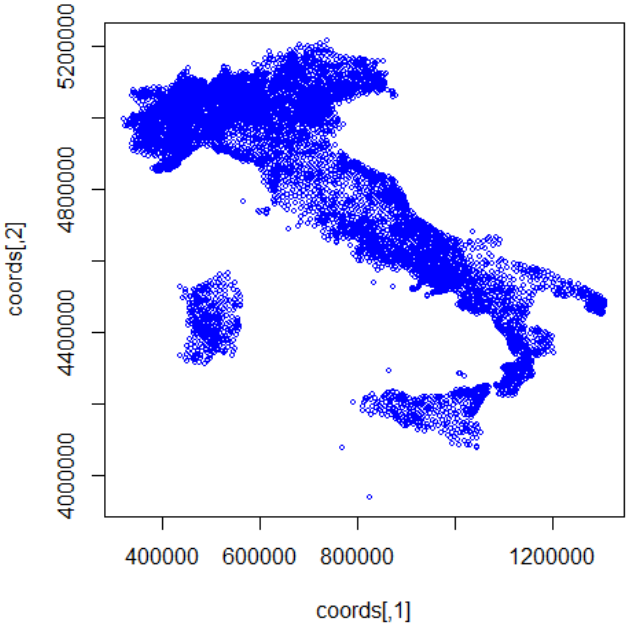
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