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## Horizontal and vertical contexts in Europeans' well-being

Fernando Bruna



Isabel Neira



Marta Portela

Adela García-Aracil



### Aim

- Analyze through a spatial lag of X (SLX) random effects multilevel model the contextual factors that affect to well-being in Europe

– Contextual factors:

representing economic and social or cultural aspects of the individual's neighborhood that affect her perceptions and behavior

micro level perspective (within neighborhoods).

macro perspective (between regions/countries).

both micro and macro (contextual) levels, through hierarchical (multilevel) models VERTICAL DEPENDENCE

#### HORIZONTAL:

SEM model in European regions, finding that such space autocorrelations indeed exist. Pierewan and Tampubolon's (2014) estimation of SAR and SEM spatial multilevel models for European well-being leads them to conclude that the results may only be explained by spatial externalities

## OUR APPROACH

LeSage (2014) recommends a *local* spillover specification. In particular, in order to study contextual effect we focus on the spatial lag of X model (SLX), which allows for local spillovers to neighboring regions through spatial lag terms for the contextual explanatory variables through a neighborhood weights matrix. This approach of the contextual factors that affect happiness in a vertical and horizontal perspective has not been analyzed jointly in previous papers.

+ Different hierarchical levels

## Framework

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- Happiness (hedonic wellness): emotions of short duration or feeling good
- Life satisfaction (eudaimonic wellness): satisfaction resulting from living a good life

## Framework

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- Determinants of well-being:
  - Individual socio-demographic (age, marital status, health, religious, gender, political, place of living, education)
  - Economic factors (income, unemployment, inflation)
  - Social/institutional factors (social capital)
  - GEOGRAPHICAL CONTEXT (social and economic contextual effects)

## ECONOMIC CONTEXTUAL FACTORS

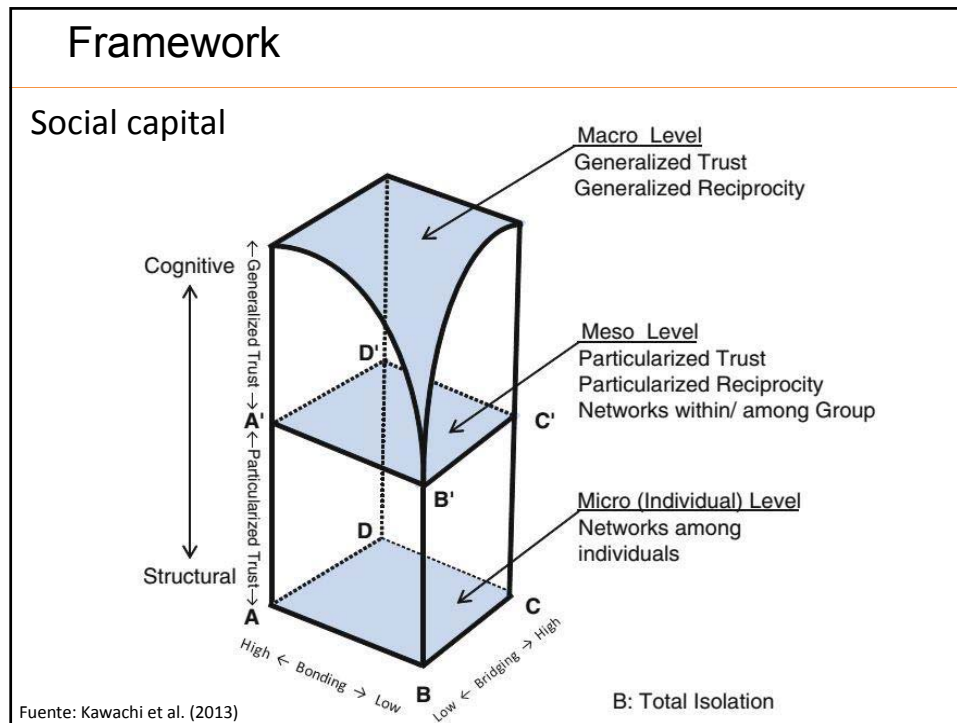
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- *GDPp*: the European regional spatial distribution of economic activity follows a core-periphery pattern, with just a few high income regions outside the geographical center of Europe and the so called *blue banana*, particularly those in Nordic countries
- *UNEMPLOYMENT*

## SOCIAL CONTEXTUAL FACTORS

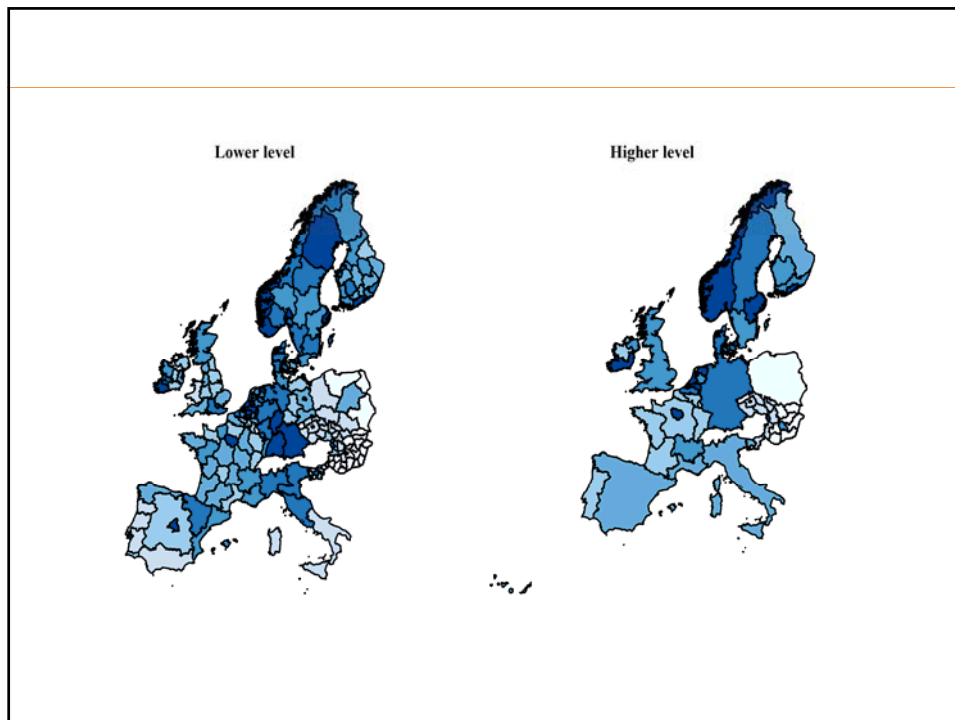
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- *Social capital*: trust, norms of reciprocity, and networks that are associated with externality effects which operate through perceptions and cognitions or in the minds of the actors (Inaba, 2013)
- NOTA: poner aquí lo de los clusters



## Data

- European Social Survey (2012)
  - 18 countries
    - 195 regions
  - Dependent variables
    - Life satisfaction (“All things considered, how satisfied are you with your life as a whole nowadays?” (0 extremely dissatisfied – 10 extremely satisfied)
    - Happy (“Taking all things together, how happy would you say you are?” (0 extremely unhappy – 10 extremely happy)
  - Covariates
    - Social capital (trust, social networks, social norms)
    - GDPpc
    - Unemployment rates
    - Control variables (socio-demographic determinants)
  - Hierarchical levels:
    - Level 1 (individuals)
    - Level 2.1 (lower regional level)
    - Level 2.2 (higher regional level)
    - Level 3 (country level)



## Strategy

- Previous works:

- Vertical spatial dependence and contextual effects

- Aslam & Corrado (2012)

$$y_{ijk} = \beta_{000} + \delta_{100}C_{ijk} + \beta_{100}(X_{ijk} - \bar{X}_{jk}) + \beta_{010}\bar{X}_{jk} + v_{00k} + u_{0jk} + e_{ijk}$$

- Horizontal spatial dependence

- Corrado & Fingleton (2012)

- SAR hierarchical model with contextual effects

## Strategy

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- Proposed models:  
(Aslam & Corrado, 2012)
  - Three level model:  
(problems of multicollinearity)
- Final specification:
  - Two level model:

## Strategy

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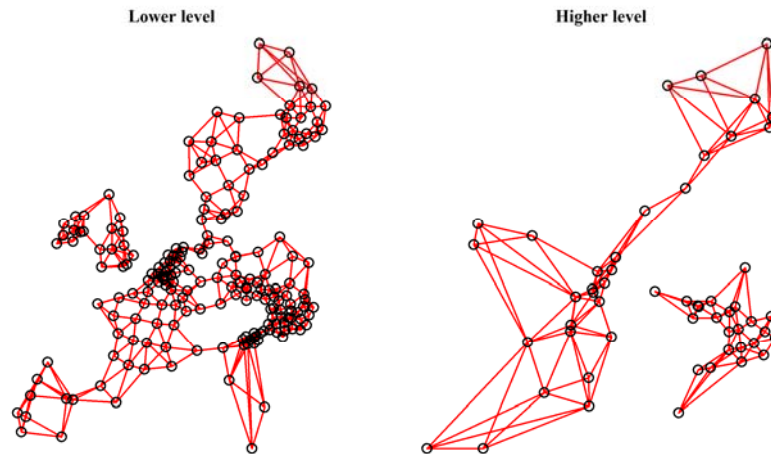
- Final specification:
  - Two level model:  

$$y_{ijk} = \beta_{00} + \delta_{10}C_{ij} + \beta_{10}X_{ij} + \gamma_{01}^1Z_j + \gamma_{01}^2WZ_j + u_{0j} + e_{ij}$$

$W$ : standardized weights matrix to the 4 nearest neighbors

## Strategy

Links between regions through the  $W$  weights matrix for two aggregation levels



## Strategy

- Final specification:

- Two level model:

$$y_{ijk} = \beta_{00} + \delta_{10}C_{ij} + \beta_{10}X_{ij} + \gamma_{01}^1Z_j + \gamma_{01}^2WZ_j + u_{0j} + e_{ij}$$

Levels 2 and 3

j countries

j higher level regions

j lower level regions

Contextual variables

Log GDPCpc or unemployment rate

and

and



<b>Results</b> SAR Model. Dependent variable: Satisfaction					
	OLS	MLS	Direct	Indirect	Total
rho		0.448*** (0.057)			
(Intercept)	5.038*** (1.266)	2.020 (1.086)			
Institutional trust	0.237* (0.112)	0.092 (0.098)	0.097	0.070	0.167
Social trust	0.489*** (0.116)	0.243* (0.098)	0.255	0.185	0.441
Social network	0.660*** (0.112)	0.440*** (0.097)	0.462	0.336	0.798
Formal networks	-0.559*** (0.166)	-0.337* (0.137)	-0.354	-0.257	-0.610
Subjective general health	0.729*** (0.184)	0.493** (0.152)	0.518	0.376	0.894
Religiosity	0.757*** (0.151)	0.578*** (0.124)	0.607	0.441	1.047
Gender female	-1.795** (0.645)	-1.070* (0.527)	-1.124	-0.816	-1.940
Household's net income decile	0.725*** (0.147)	0.623*** (0.120)	0.654	0.475	1.129
R-squared	0.766				
Adj. R-squared	0.756				
Log likelihood	-110.75	-79.61			
p-value Moran's I	0.000	0.009			
Moran's I residuals	0.491	0.105			
Sum squared errors	35.55	24.71			

<b>Results</b> Multilevel Model. Dependent variable: Satisfaction		
	(1)	
<b>Centered variables ()</b>		
Institutional trust	0.355*** (0.0141)	
Social trust	0.415*** (0.0141)	
Social network	0.262*** (0.0136)	
Formal network	-0.0378** (0.0123)	
Civic engagement	0.0292* (0.0128)	0.0124*** (0.00420)
<b>Regional means ()</b>		2.975*** (0.0284)
Institutional trust	0.478*** (0.0969)	0.00416
Social trust	0.483*** (0.0867)	
Social network	0.792*** (0.120)	
Formal network	-0.177 (0.135)	
Civic engagement	0.0442 (0.121)	
<b>Country effects ()</b>	Yes	

<b>Results</b> Multilevel Model. Dependent variable: Satisfaction		
	(2)	(3)
<b>Individual social capital ()</b>		
Institutional trust	0.358*** (0.0140)	0.362*** (0.0140)
Social trust	0.418*** (0.0141)	0.423*** (0.0140)
Social network	0.264*** (0.0135)	0.268*** (0.0135)
Formal network	-0.0411*** (0.0123)	-0.0427*** (0.0123)
Civic engagement	0.0304* (0.0128)	0.0266* (0.0128)
<b>Country effects ()</b>		
	No	No
<b>Other contextual variables (, )</b>		
Log GDPpc (country)	1.026*** (0.145)	
Unemployment (country)		-0.0394*** (0.00939)

<b>Results</b> Multilevel Model. Dependent variable: Satisfaction		
	(4)	(5)
<b>Individual social capital ()</b>		
Institutional trust	0.359*** (0.0140)	0.359*** (0.0140)
Social trust	0.419*** (0.0140)	0.420*** (0.0140)
Social network	0.263*** (0.0135)	0.267*** (0.0135)
Formal network	-0.0416*** (0.0123)	-0.0415*** (0.0123)
Civic engagement	0.0299* (0.0128)	0.0276* (0.0128)
<b>Country effects ()</b>		
	No	No
<b>Other contextual variables (, )</b>		
Log GDPpc (higher)	0.721*** (0.140)	
Log GDPpc (higher)	0.277 (0.166)	
Unemployment (higher)		-0.00174 (0.00984)
Unemployment (higher)		-0.101*** (0.0168)

<b>Results</b> Multilevel Model. Dependent variable: Satisfaction		
	(6)	(7)
<b>Individual social capital ()</b>		
Institutional trust	0.359*** (0.0140)	0.361*** (0.0140)
Social trust	0.419*** (0.0140)	0.422*** (0.0140)
Social network	0.263*** (0.0135)	0.268*** (0.0135)
Formal network	-0.0414*** (0.0123)	-0.0425*** (0.0123)
Civic engagement	0.0305* (0.0128)	0.0270* (0.0128)
<b>Country effects ()</b>		
	No	No
<b>Other contextual variables (,)</b>		
Log GDPpc (lower)	0.371** (0.128)	
Log GDPpc (lower)	0.674*** (0.163)	
Unemployment (lower)		-0.00457 (0.0124)
Unemployment (lower)		-0.0552*** (0.0166)

<b>Results</b> Multilevel Model. Dependent variable: Satisfaction			
	(2)	(3)	(4)
	0.203*** (0.0255)	0.238*** (0.0297)	0.189*** (0.0239)
	2.973*** (0.0284)	2.973*** (0.0284)	2.973*** (0.0284)
	0.0640	0.0740	0.0599
	(5)	(6)	(7)
	0.188*** (0.0247)	0.183*** (0.0233)	0.219*** (0.0277)
	2.974*** (0.0284)	2.973*** (0.0284)	2.973*** (0.0284)
	0.0594	0.0579	0.0686

## Conclusions

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- Contextual factors influence well-being
  - Two different aggregation levels
  - Use of spatial lags of macro variables
- Contextual factors of neighboring areas explain individual life satisfaction (and happiness)
  - Latent variables conditioning the spatial distribution of Europeans' well-being

## Ongoing research

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- Spatial multilevel model still ignores the evaluation of residual spatial autocorrelation at the macro level
- Improve our understanding of horizontal dependences between contextual variables explaining individual perception and behavior

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