

APPENDIX

Table A1. Descriptive statistics

Variables	mean	s.d.	min	max
Real GDP per capita growth (2007-2016)	0.318	1.653	-11.002	5.616
Real GDP per capita (2007)	25,760.4	12,518.2	3,300.9	88,181.6
Employment growth (2000-2007)	1.186	1.560	-3.029	12.317
Capital growth (2000-2007)	2.947	3.659	-6.042	23.140
Population density (2007)	349.760	863.623	3.08215	9318.699
Education (2007)	23.35	8.32	7.3	47.6
RD expenditures on GDP % (2007)	1.384	1.168	0.07	6.72
Quality of institutions (2010)	0.148	.961	-2.838	1.762
Density of agriculture and mining local units(2007)	0.0326	.0610	.00003	0.6243
Density of agricultural units (2007)	0.0325	.0610	0	0.6242
Density of mining units (2007)	0.0001	.0001	0	0.0004
Number of observations: 260				

Table A2 –robustness checks: EU15 regions only

Dependent variable: Average annual regional real GDP per capita growth rate	2007-2016	2012-2016
(log) Regional real GDP per capita	-0.0230** (0.009)	-0.0434* (0.024)
Employment growth (2000-7)	0.0916 (0.061)	0.0031 (0.096)
Capital growth (2000-7)	-0.0120 (0.031)	0.0287 (0.066)
Population density (2007)	0.0000 (0.000)	0.0000 (0.000)
Education (2007)	0.0004*** (0.000)	0.0006** (0.000)
R&D expenditures (2007)	0.0013** (0.001)	0.0026* (0.001)
Quality of government (2010)	0.0067** (0.003)	0.0033 (0.006)
Density of local units (2007)	-0.0606* (0.034)	-0.1139° (0.076)
Constant	-0.0827** (0.036)	-0.1340 (0.095)
Wald test – spatial lag of the dependent variable (p-value), SDM	0.58	0.77
Wald test (joint) – spatial lag of the independent variables (p-value), SDM	0.97	0.41
Wald test – spatial error (p-value), SEM	0.86	0.75
R2 (Model 2) – Square Correlation (Models 1 and 3)	0.58	0.30
Country group dummies	YES	YES
Observations	204	204

Robust standard errors in parentheses. °p<0.15, * p < 0.10, ** p < 0.05, *** p < 0.01. Regional real GDP per capita measured in 2007 in model 1 and in 2012 in model 2. GDP deflator =1 in 2010. Country group dummies included though not displayed.

Country group dummies are as follows: South (Spain, Portugal, Italy and Greece), West (France, Ireland and UK), North (Denmark, Finland and Sweden), Centre (Germany, Austria, Netherlands, Belgium and Luxembourg), Eurozone (Spain, Portugal, Italy, Greece, France, Ireland, Finland, Germany, Austria, Netherlands, Belgium, Luxembourg, European Stability Mechanism - ESM (Greece, Ireland, Portugal and Spain).

Table A3 – robustness checks: estimates based on a first-order contiguity weight matrix (row-standardized)

Dependent variable: Average annual regional real GDP per capita growth rate	2007-2016 (1) SDM			2012-2016 (2) SDM		
	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
(log) Regional real GDP per capita	-0.0214*** (0.002)	0.0050*** (0.001)	-0.0165*** (0.002)	-0.0275*** (0.005)	0.0096*** (0.002)	-0.0179*** (0.003)
Employment growth (2000-7)	0.0125 (0.045)	-0.2127*** (0.063)	-0.2002*** (0.059)	-0.0256 (0.088)	-0.1279 (0.113)	-0.1535 (0.096)
Capital growth (2000-7)	0.0227 (0.021)	0.0838*** (0.028)	0.1064*** (0.026)	0.0506 (0.042)	0.1107** (0.052)	0.1614*** (0.043)
Population density (2007)	0.0000 (0.000)	0.0000 (0.000)	0.0000* (0.000)	0.0000 (0.000)	0.0000 (0.000)	0.0000* (0.000)
Education (2007)	0.0005*** (0.000)	-0.0003** (0.000)	0.0001 (0.000)	0.0002 (0.000)	-0.0001 (0.000)	0.0000 (0.000)
R&D expenditures (2007)	0.0010 (0.001)	0.0001 (0.001)	0.0010 (0.001)	0.0026* (0.001)	-0.0008 (0.001)	0.0017 (0.001)
Quality of government (2010)	0.0047*** (0.002)	-0.0019 (0.002)	0.0028** (0.002)	0.0047 (0.003)	-0.0041 (0.003)	0.0006 (0.003)
Density of local units (2007)	-0.738*** (0.013)	-0.0378*** (0.015)	-0.1115*** (0.017)	-0.1167*** (0.026)	0.0127 (0.027)	-0.1040*** (0.029)
Rho		-0.4216*** (0.073)			0.6068*** (0.077)	
Wald test – spatial lag of the dependent variable (p-value), SDM	0.00	0.00	0.00	0.00	0.00	0.00
Wald test (joint) – spatial lag of the independent variables (p-value), SDM	0.00	0.00	0.00	0.00	0.00	0.00
Square Correlation		0.71			0.44	
AIC		-1656.623			-1327.903	
BIC		-1560.485			-1231.765	
Country group dummies	YES	YES	YES	YES	YES	YES
Observations	260	260	260	260	260	260

Robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. Regional real GDP per capita measured in 2007 in model 1 and in 2012 in model 2. GDP deflator =1 in 2010. Country group dummies included though not displayed.

Country group dummies are as follows: South (Spain, Portugal, Italy and Greece), West (France, Ireland and UK), North (Denmark, Finland and Sweden), Centre (Germany, Austria, Netherlands, Belgium and Luxembourg), Central and Eastern European Countries (Estonia, Latvia, Lithuania, Malta, Cyprus, Czech Republic, Poland, Slovakia, Slovenia, Hungary, Bulgaria and Romania), Eurozone (Spain, Portugal, Italy, Greece, France, Ireland, Finland, Germany, Austria, Netherlands, Belgium, Luxembourg, Estonia, Latvia, Lithuania, Malta and Cyprus), European Stability Mechanism - ESM (Greece, Ireland, Portugal, Cyprus and Spain).

Table A4 – robustness checks: estimates based on a first-order contiguity weight matrix (row-standardized) for agriculture and mining

Dependent variable: Average annual regional real GDP per capita growth rate	2007-2016 (1) SDM, Agriculture			2007-2016 (2) SDM, Mining		
	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
(log) Regional real GDP per capita	-0.0214*** (0.002)	0.0050*** (0.001)	-0.0165*** (0.002)	-0.0191*** (0.002)	0.0031*** (0.001)	-0.0160*** (0.002)
Employment growth (2000-7)	0.0125 (0.045)	-0.2127*** (0.063)	-0.2002*** (0.059)	0.0577 (0.045)	-0.1506** (0.066)	-0.0928 (0.064)
Capital growth (2000-7)	0.0226 (0.021)	0.0838*** (0.028)	0.1064*** (0.026)	0.0145 (0.022)	0.0504* (0.029)	0.0649** (0.028)
Population density (2007)	0.0000 (0.000)	0.0000 (0.000)	0.0000* (0.000)	0.0000 (0.000)	0.0000 (0.000)	0.0000 (0.000)
Education (2007)	0.0005*** (0.000)	-0.0003** (0.000)	0.0001 (0.000)	0.0005*** (0.000)	-0.0003** (0.002)	-0.0002 (0.000)
R&D expenditures (2007)	0.0010 (0.001)	0.0001 (0.001)	0.0010 (0.001)	0.0010 (0.001)	0.0006 (0.001)	0.0016* (0.001)
Quality of government (2010)	0.0047*** (0.002)	-0.0019 (0.002)	0.0028** (0.002)	0.0070*** (0.002)	-0.0004 (0.002)	0.0065*** (0.001)
Density of local units (2007)	-0.738*** (0.013)	-0.0378*** (0.015)	-0.1115*** (0.017)	-6.1827 (15.187)	-43.1727** (17.983)	- 49.3554*** (18.892)
Rho		-0.4216*** (0.073)			-0.3374*** (0.071)	
Wald test – spatial lag of the dependent variable (p-value), SDM	0.00	0.00	0.00	0.00	0.00	0.00
Wald test (joint) – spatial lag of the independent variables (p-value), SDM	0.00	0.00	0.00	0.00	0.00	0.00
Square Correlation		0.71			0.67	
AIC		-1656.606			-1632.167	
BIC		-1560.468			-1543.15	
Country group dummies	YES	YES	YES	YES	YES	YES
Observations	260	260	260	260	260	260

Robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. Regional real GDP per capita

measured in 2007 in model 1 and in 2012 in model 2. GDP deflator =1 in 2010. Country group dummies included though not displayed.

Country group dummies are as follows: South (Spain, Portugal, Italy and Greece), West (France, Ireland and UK), North (Denmark, Finland and Sweden), Centre (Germany, Austria, Netherlands, Belgium and Luxembourg), Eastern European Countries (Estonia, Latvia, Lithuania, Malta, Cyprus, Czech Republic, Poland, Slovakia, Slovenia, Hungary, Bulgaria and Romania), Eurozone (Spain, Portugal, Italy, Greece, France, Ireland, Finland, Germany, Austria, Netherlands, Belgium, Luxembourg, Estonia, Latvia, Lithuania, Malta and Cyprus), European Stability Mechanism - ESM (Greece, Ireland, Portugal, Cyprus and Spain).