Convergence Clubs and Regression Trees

0686 - Spatial Economics

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Data Recap

European Regional Database by Cambridge Econometrics

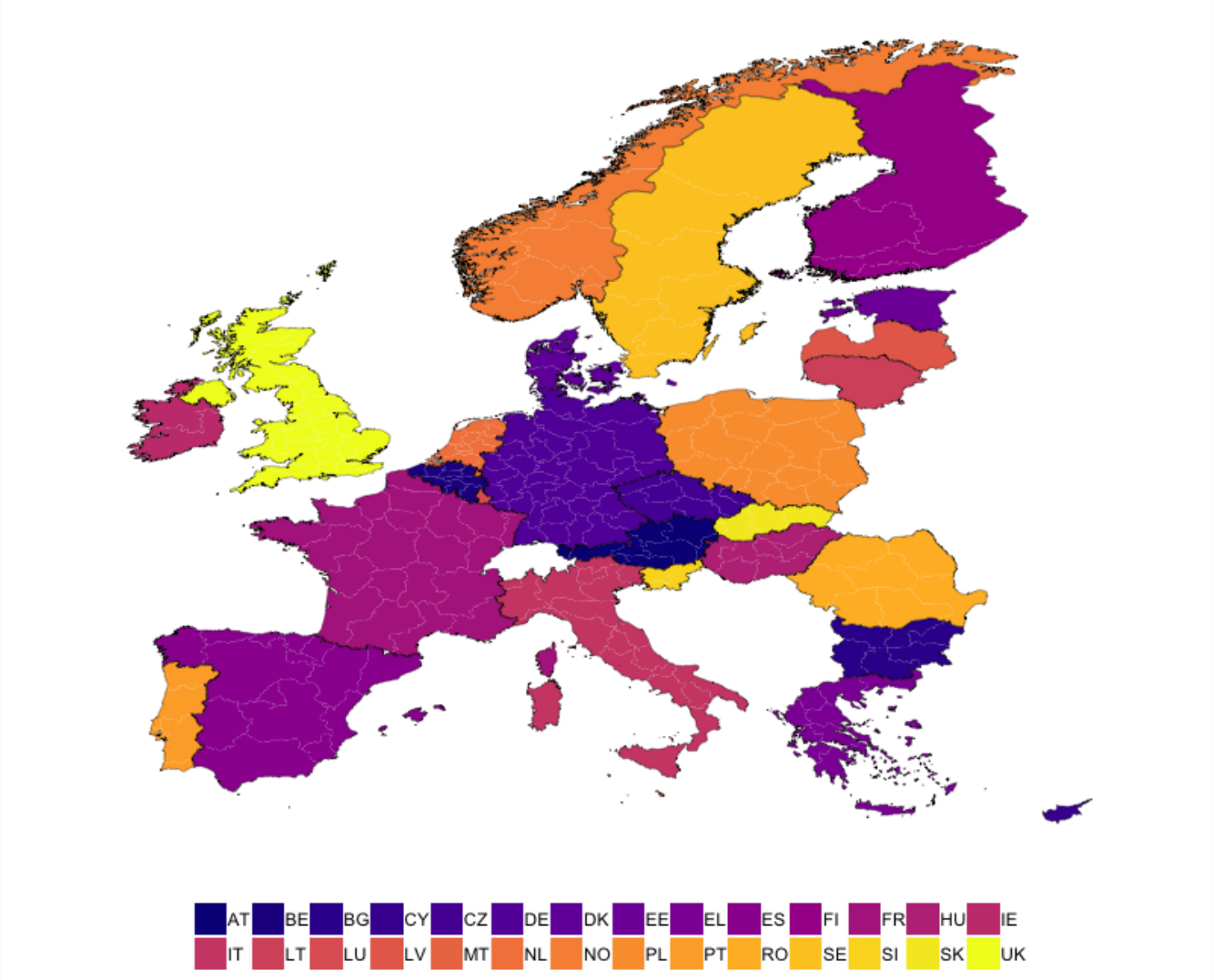
- Comprehensive dataset for NUTS2-regions over long period of time

We limit the dataset to:

- Focus on period after 2000 (possible breakpoint financial crisis 2008/9)
- Exclude Croatia (missing observations for employment indicators)

Results in a dataset of 273 regions for 28 countries

Data Recap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Oh what a merry regression tree

Split observations into clubs:

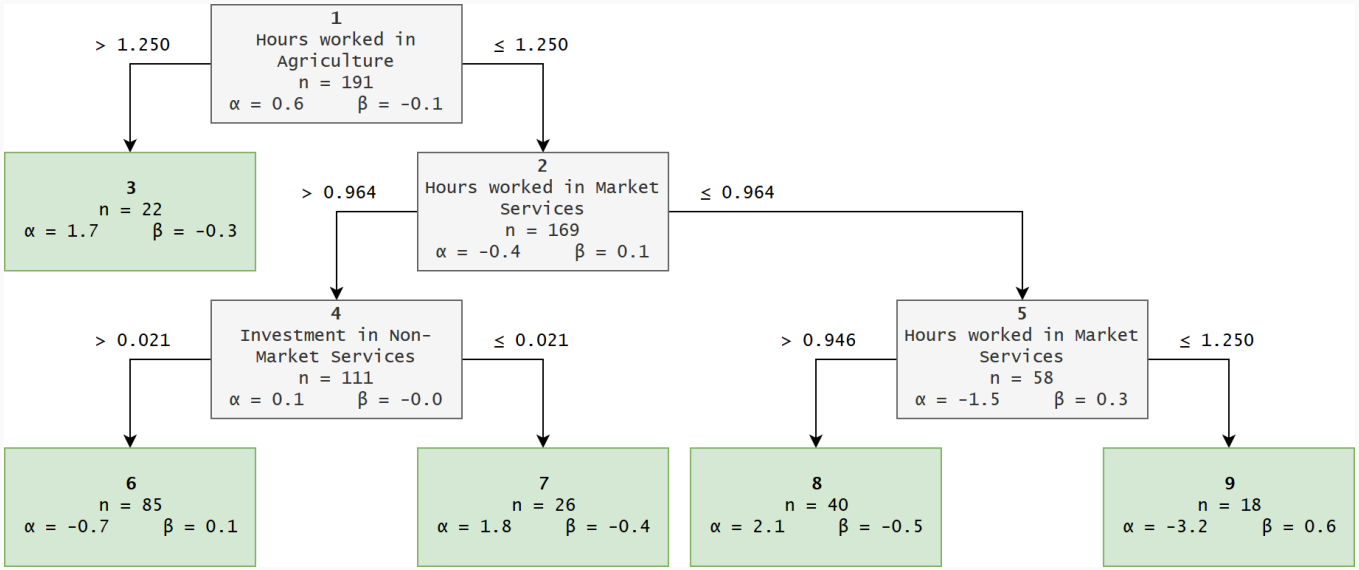
```
tree <- function(data, split_vars, end_criteria) {
  split <- find_best_split(...)
  if (!end_criteria) {
    return(list(tree(split$data1, ...),
                tree(split$data2, ...)))
  } else { # if(end_criteria)
    return(data)
  }
}
```

Regression Tree

We receive a recursive, tree-like data structure that is:

- hard to deal with (**a lot** of helper functions are necessary)
- nice

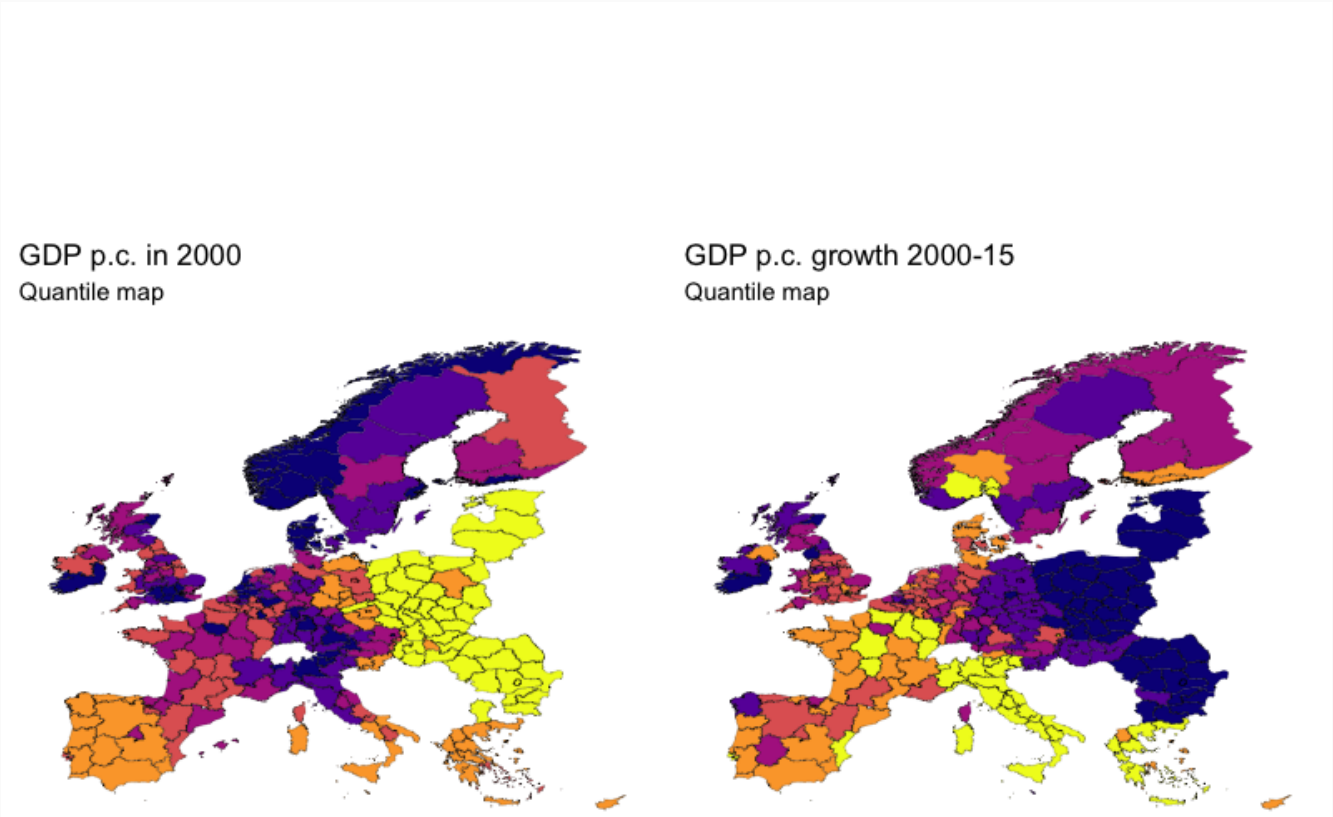
<!– Add pretty (?) tree, dummy ahead: –>



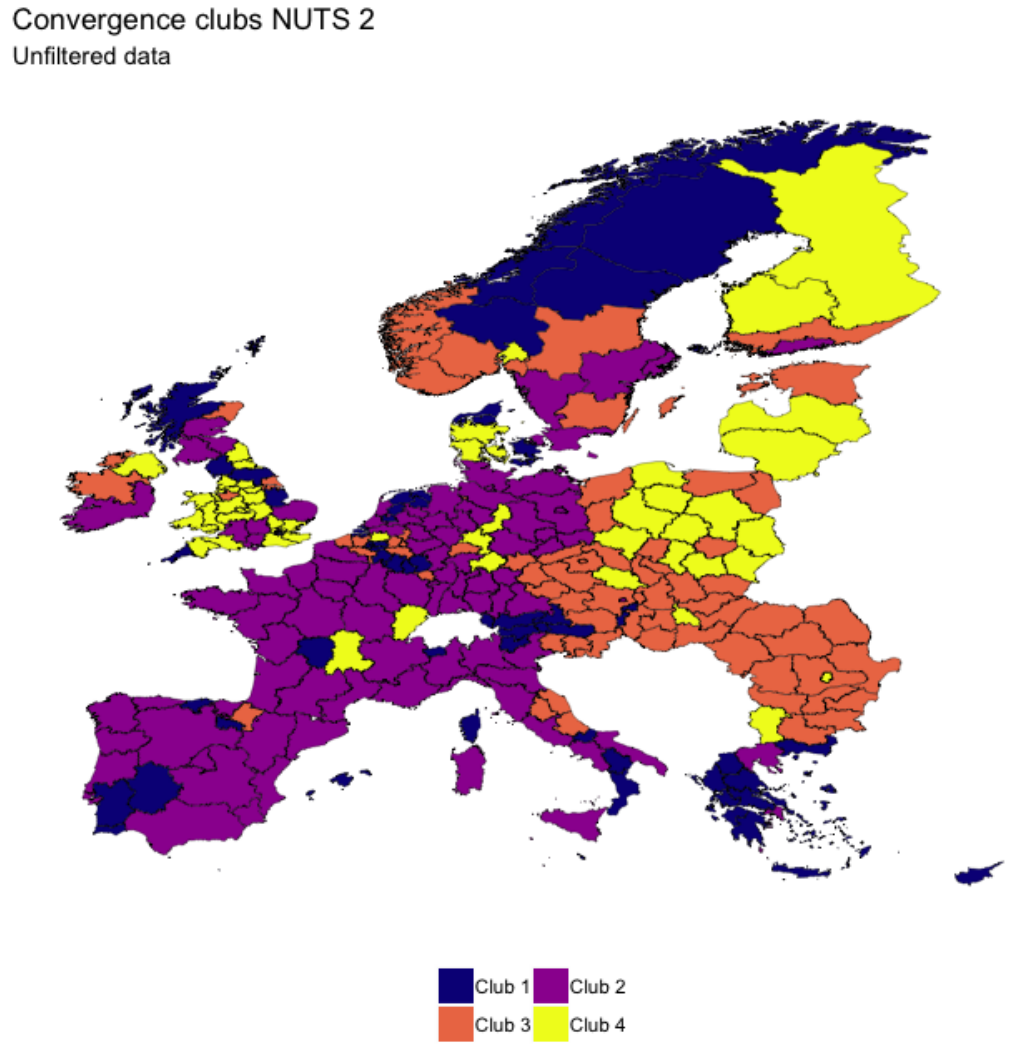
Regression Tree

Our results are comparable to partykit (Hothorn and Zeileis 2015).

Still there's the caveat of spatially filtering the data. ## Motivation



Results


Convergence clubs NUTS 2
Unfiltered data
Club 1
Club 2
Club 3
Club 4

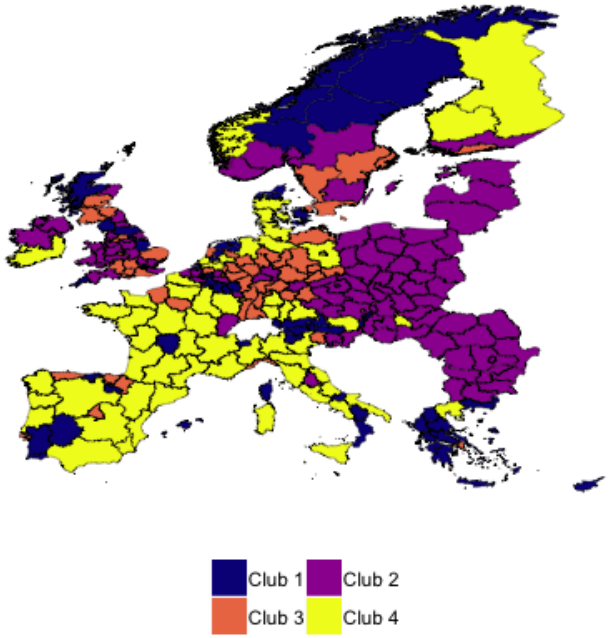
Results

Table 1: Regression results using unfiltered data

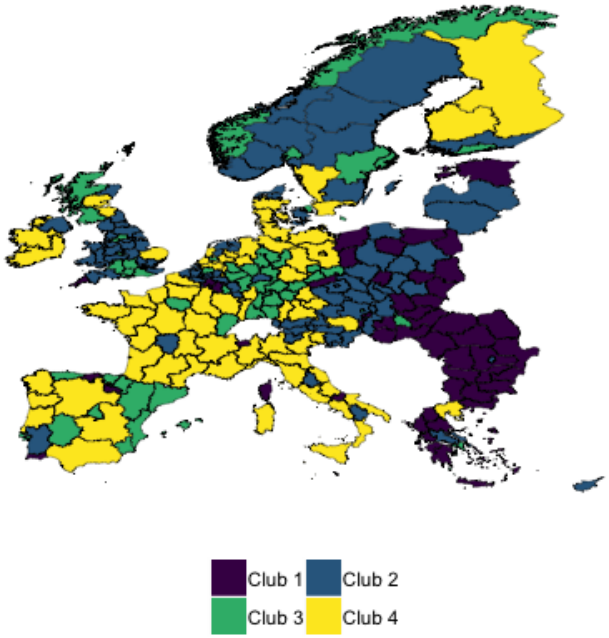
	Dependent variable:			
	GDP p.c. growth rate 2000-15			
	(1)	(2)	(3)	(4)
Constant	-1.139^{***}	-0.265	1.769^{***}	2.922^{***}
	(0.323)	(0.360)	(0.146)	(0.147)
Initial GDP p.c.	0.120^{***}	0.035	-0.159^{***}	-0.275^{***}
	(0.032)	(0.036)	(0.016)	(0.015)
Observations	63	92	67	51
Residual Std. Error	0.118 (df = 61)	0.105 (df = 90)	0.129 (df = 65)	0.086 (df = 49)
Note:				*p<0.1; **p<0.05; ***p<0.01

Results

Convergence clubs NUTS 2
SAR-filtered data



Convergence clubs NUTS 2
SEM-filtered data



Results

Table 2: Regression results using SAR-filtered data

	Dependent variable:			
	GDP p.c. growth rate 2000-15			
	(1)	(2)	(3)	(4)
Constant	-1.174^{***}	1.445^{***}	1.296^{***}	-0.037
	(0.343)	(0.122)	(0.383)	(0.470)
Initial GDP p.c.	0.109^{***}	-0.142^{***}	-0.128^{***}	-0.003
	(0.034)	(0.013)	(0.037)	(0.047)
Observations	63	97	55	58
Residual Std. Error	0.125 (df = 61)	0.124 (df = 95)	0.073 (df = 53)	0.110 (df = 56)
Note:				*p<0.1; **p<0.05; ***p<0.01

Results

Table 3: Regression results using SEM-filtered data

	Dependent variable:			
	GDP p.c. growth rate 2000-15			
	(1)	(2)	(3)	(4)
Constant	-0.039^{**}	0.088^{***}	0.016	-0.021
	(0.018)	(0.014)	(0.020)	(0.022)
Initial GDP p.c.	-0.277^{***}	-0.265^{***}	-0.061^{**}	-0.132^{***}
	(0.022)	(0.026)	(0.028)	(0.047)
Observations	55	89	59	70
Residual Std. Error	0.117 (df = 53)	0.120 (df = 87)	0.086 (df = 57)	0.106 (df = 68)
Note:				*p<0.1; **p<0.05; ***p<0.01

- club-plots
- some first LM vs. SAR vs. SEM comparisons

Literatur

Hothorn, Torsten, and Achim Zeileis. 2015. “partykit: A Modular Toolkit for Recursive Partytioning in R.” *Journal of Machine Learning Research* 16: 3905–9. http://jmlr.org/papers/v16/hothorn15a.html.