

DATA RELATED METHODOLOGICAL CHALLENGES OF REGIONAL CONVERGENCE AND RESILIENCE

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From Solow to regional convergence

- **Solow, 1956: exogenous growth model**
- **Barro and Sala-i-Martin, 1991-1995**
 - Convergence analysis
- **Regional level models**
 - Since 2000
 - Remaining at NUTS2 level – data availability
- **NUTS 3 level**
 - In the 2010s
- **Spatial structure based models**
 - recently
 - to cover the surface continuously, based on merging NUTS3 regions to create metropolitan regions

Convergence

- **Absolute convergence**
 - if differences are temporary
- **Conditional convergence**
 - if differences are permanent because of cross-country structural heterogeneity
- **Club convergence**
 - if initial conditions determine long-run outcomes
- **β -convergence**
 - cross-sectional analysis of growth rates
- **σ -convergence**
 - time series comparison of distributions (generally summarized by the standard deviation)

GDP per capita

- **GDP calculation changes in time**
 - time series are not comparable in time
 - long series are not available at regional level
 - now typically since 2000
- **Price level use** – convergence at national, divergence at regional level problem

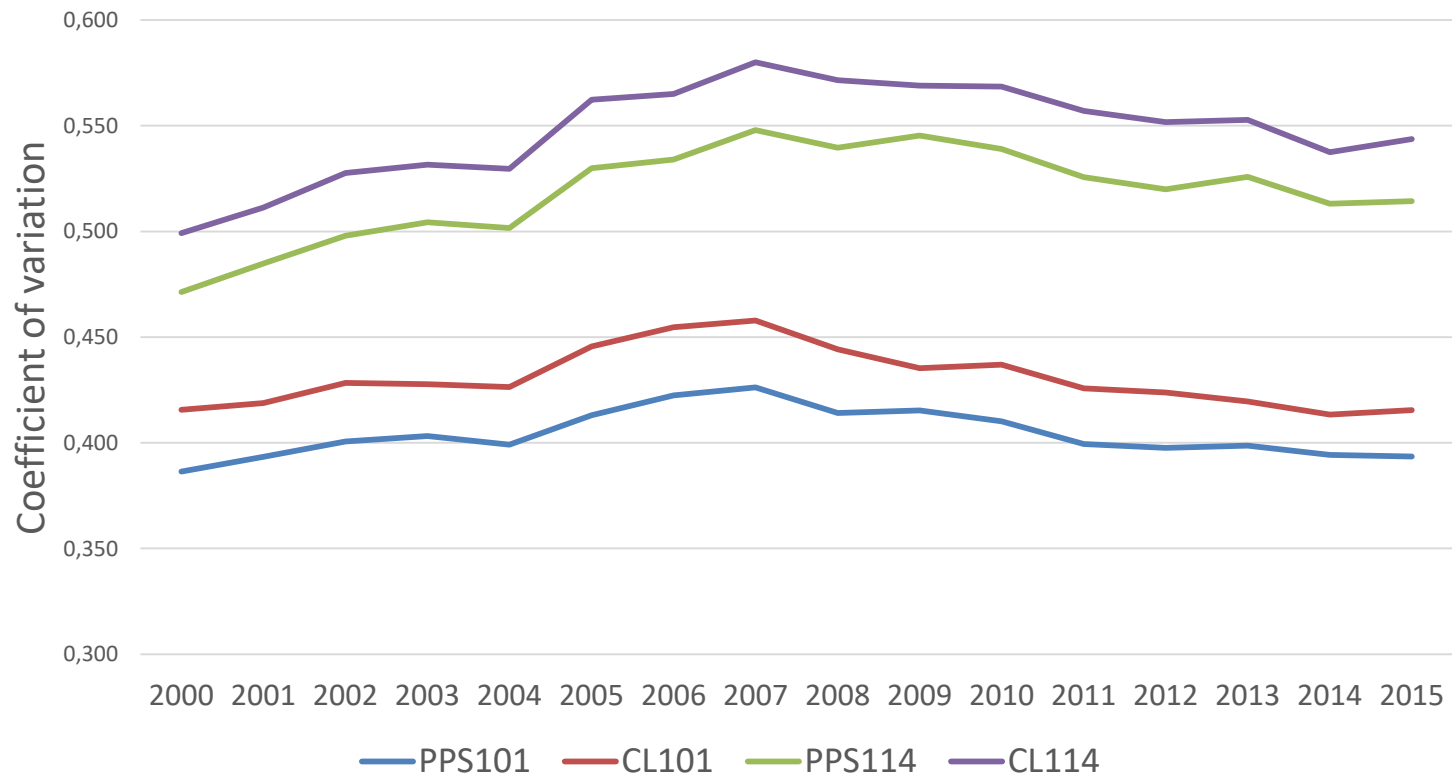
Approach	Meaning	Advantage	Disadvantage
Local currency	Nominal convergence	Easy to find data and calculate	Comparison of different currency areas is not possible
Local currency transformed by exchange rate	Nominal convergence	Easy to find data and calculate	Exchange rate volatility does not reflect neither economic performance nor price level
PPS	Nominal convergence Standard of living	Good measure of convergence of standard of living	Lack of regional price indices, distortion at regional level
Volume index	Real convergence	Best measure of production convergence	Lack of regional price indices, distortion at regional level

Territorial scope

- **Traditionally at NUTS2 level**
 - spatial structure of the economy does not follow it
 - too large
- **NUTS3 level**
 - better, but not for capital metropolitan regions
 - in our example, Budapest, Bratislava, Prague and Warsaw are separated from their agglomeration
- **NUTS2/3 – metropolitan regions**
 - idea in ESPON documents
 - own elaboration in 2016
 - Eurostat 2018
- **In our analysis**
 - The Eurostat version except Bratislava
 - versus the NUTS3

σ -convergence

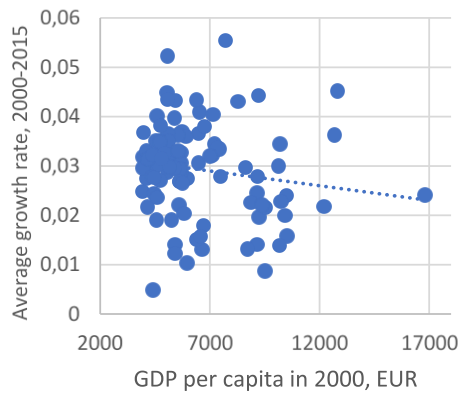
- PPS vs chain linked volumes
- NUTS3 (114 units) vs NUTS2/3 (101 units) compared



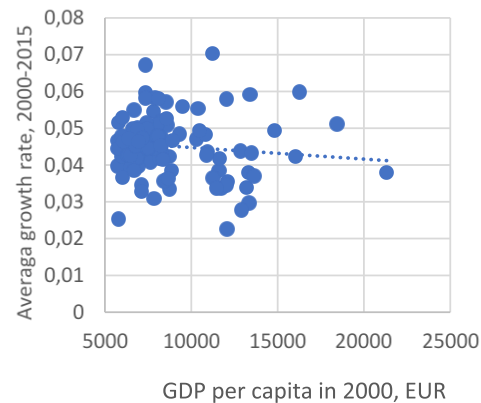
β -convergence, 2000-2015

	CL 101	PPS 101	CL 114	PPS 114
Initial level	-5.98e-7 (-1.55)	-6.57e-7* (-1.77)	-2.26e-7 (-0.74)	-2.77e-7 (-0.94)
Constant	0.033*** (13.35)	0.049*** (21.36)	0.032*** (15.03)	0.048*** (24.63)

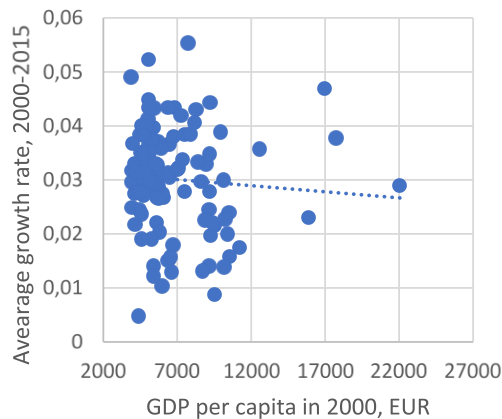
Chain linked 101 regions



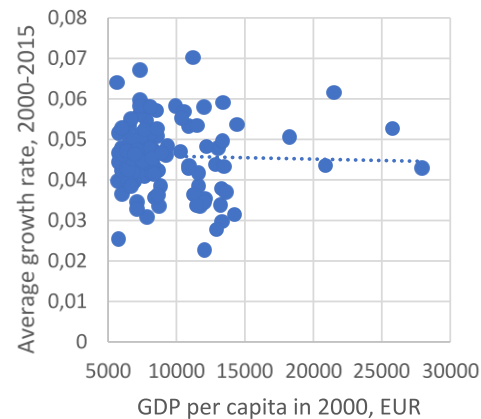
PPS 101 regions



Chain linked 114 regions

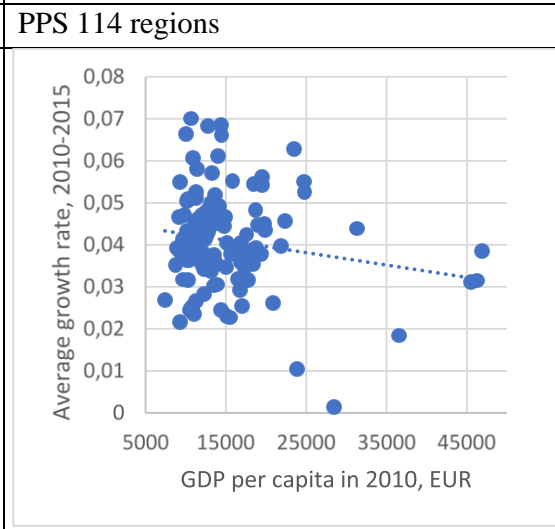
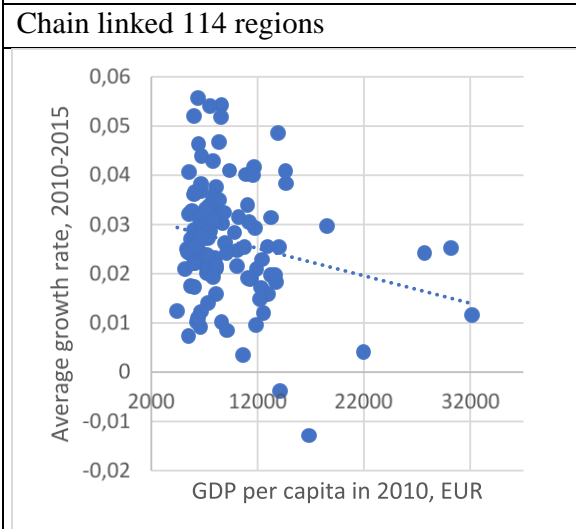
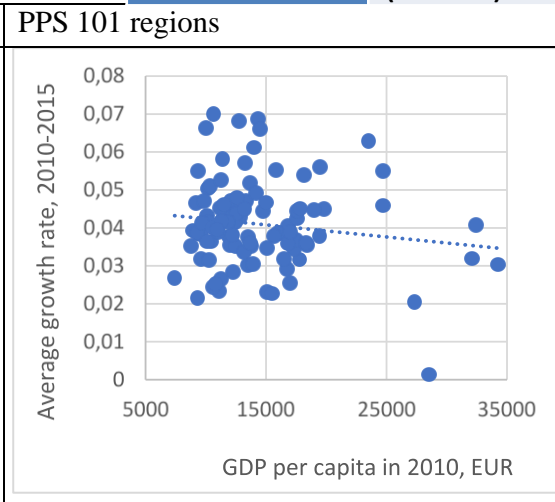
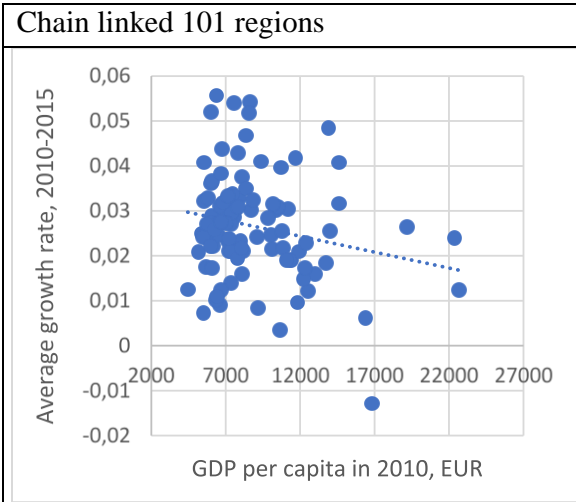


PPS 114 regions



The resilience period

	CL 101	PPS 101	CL 114	PPS 114
Initial level	-7.07e-7* (-1.96)	-5.89e-7* (-1.69)	-5.59e-7** (-2.42)	-5.13e-7** (-2.43)
Constant	0.033*** (10.11)	0.046*** (14.61)	0.032*** (13.90)	0.046*** (21.21)



Conclusion

- **Results are data dependent**
 - conclusion based on stylized facts depends on data
- **Nomenclature should be stable**
 - NUTS delimitations change often by the needs of EU funds hunting
 - maybe advantageous for governments, inconvenience for researchers
- **Lack of regional price indices**
 - results are slightly biased through partial consideration of price differences
 - the challenge can be helped by online price information and Big Data issues
- **To explain the growth patterns shown by the regions, we need additional information**
 - sectoral data (GDP or GVA, employment)
 - detailed regional indicators that are not yet available at NUTS3 or metropolitan regions level

THANK YOU FOR YOUR ATTENTION!

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