



 POLITECNICO DI MILANO



Reference scenario

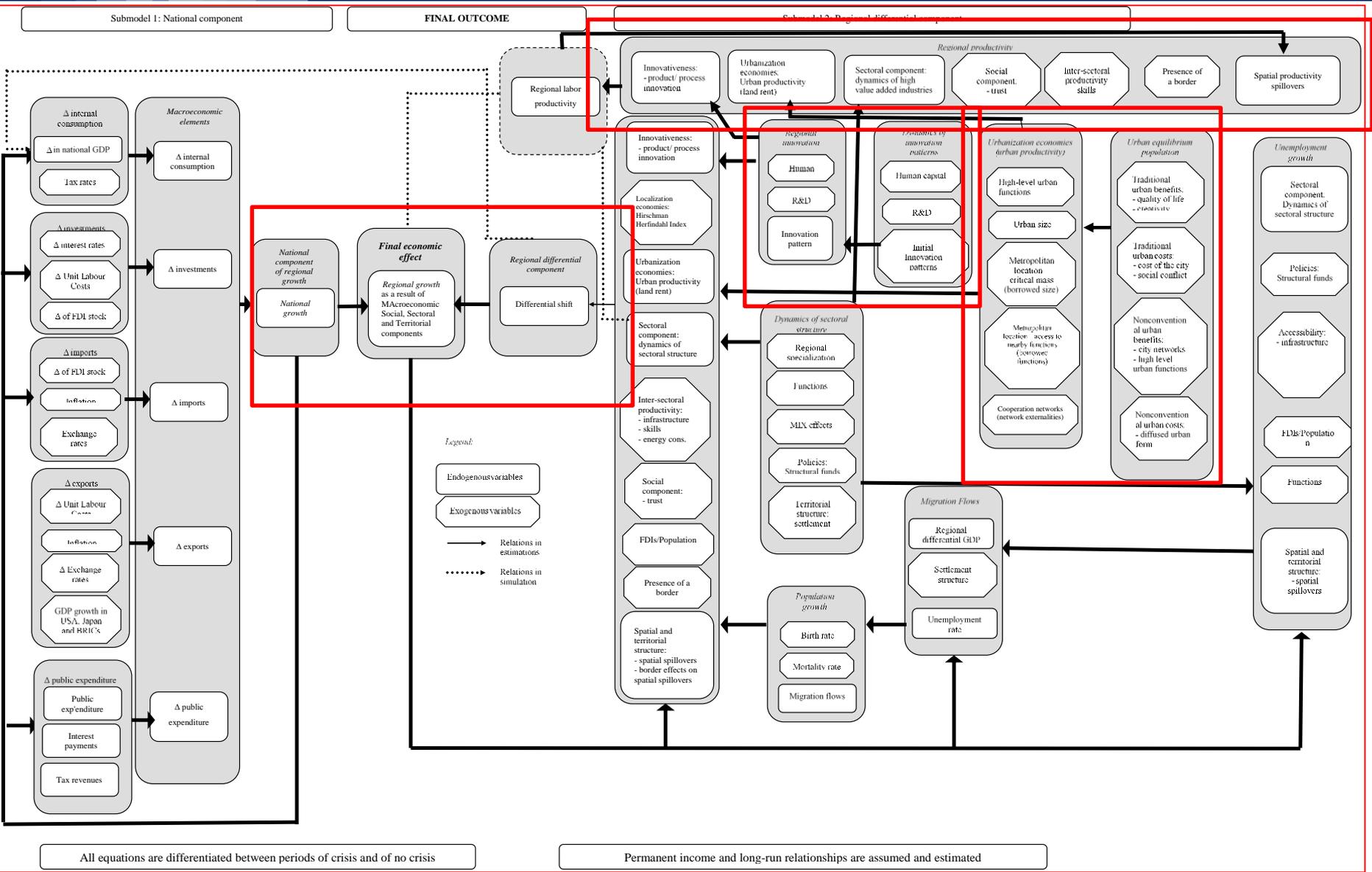
Roberto Camagni, Roberta Capello and Andrea Caragliu

Politecnico di Milano

SAF, Brussels, 2 October 2018



The new structure of the MASST4





The new (4th) version of the MASST model (MASST4)

In the fourth generation of the MASST model, three main advances have been introduced:

- The inclusion of **a three-periods (pre-crisis; crisis; after-crisis)** panel structure for both the regional and national sub-models with the aim to **capture structural changes in economic relationships induced by the crisis;**
- The strengthening of the regional part of the model, with the aim to account for the **territorial complexity explained by regional development theories**, in particular:
 - differentiated territorial patterns of innovation;
 - structural urban dynamics;
 - territorial capital assets explaining regional productivity levels.
- The broadening of the model to include major **institutional changes** that have recently taken place (e.g., **Brexit**).



The new structure of the MASST4: outputs

Exogenous and endogenous variables included in the MASST4 model:

	National submodel	Regional and urban submodel
Number of equations	6	11
Outcomes	GDP growth	Regional differential shift
(endogenous variables)	Consumption growth	Manufacturing employment growth
	Investment growth	Service employment growth
	Import growth	Regional innovation
	Export growth	Evolution in regional innovation patterns
	Public expenditure growth	Urbanization economies (urban land rent)
	Potential GDP	Equilibrium urban population
		GDP spatial spillovers
		Unemployment growth
		Population growth
		Migration growth
		Regional differential shift



The new structure of the MASST4: levers

Exogenous and endogenous variables included in the MASST4 model:

National submodel

Regional and urban submodel

**Levers
(exogenous variables)**

Tax rates
Private interest rates
Interest on public debt
Unit Labour Costs
Growth of FDI stock
Inflation rate
Trade-weighted exchange rates
GDP growth of United States and Japan
GDP growth of BRIC countries

Human capital
R&D expenditure
Regional specialization
Functions performed
MIX effects
Structural Funds expenditure
Territorial settlement structure
Birth rates
Death rates
Net migratory flows
Regional Quality of Governance
Urban quality of life
Urban land rent
Urban crime rates
City networks
High-level urban functions
Borrowed size
Borrowed functions
Spatial lags of functions
Multimodal accessibility
Regional FDI stock
Trade-based spillovers



The reference scenario differs from a **pure baseline scenario**.

A baseline scenario is a trend scenario, i.e. it is an extrapolation of past trends. A reference scenario takes into account structural changes of the last period, when they occur.

Word of cautiousness!

MASST is not made to provide precise estimates of future GDP levels, but rather to highlight the **main tendencies, major adjustments to change, relative behavioural paths** that will be at work, given some conditional assumptions about the influence of the main driving forces (**conditional foresights: not forecasts!**).

It provides scenarios depicting ***tendencies and relative behavioural paths of regional GDP growth*** in each individual region under certain conditions.



Qualitative assumptions

Model's levers

Quantitative assumptions (targets in 2035)

Macroeconomic assumptions

Assumptions on macroeconomic trends

High volatility of investments, decreasing in the long run

Coefficient of investment trends

Lower value

High reactivity of investments growth to GDP growth, decreasing in the long run

Coefficient of GDP growth with respect to Investment growth

Lower value

Risk of protectionism and therefore lower export increase

Constant of export growth

Lower value

Permanent controls on national deficits and debts

Targets on deficits and debts

3% : Deficit / GDP
60%: Debt / GDP for Eastern countries
90% : Debt / GDP for Western countries
110% : Debt / GDP for Western countries belonging to cluster 1*

Some controlled exceptions of public expenditures

Targets on debts

110% : Debts over GDP on "problematic countries"

Low inflation rates

Inflation rate

2,5% Western countries
5% Eastern countries

End of the expansionary monetary policy (quantitative easing)

Interest rates

3% Western countries;
4% Eastern countries
4% Western countries belonging to cluster 1;
6% Eastern countries belonging to cluster 1



Assumptions on industrial trends

Qualitative assumptions	Model's levers	Quantitative assumptions (targets in 2035)
Initial launch of high-tech industry in Europe	EU growth rate of High-tech industrial sectors	Increase of value added at European level for high-tech industries (+1.5% as an average with respect to the past)
Increase in high-value added services related to the adoption of Industry 4.0 related technologies	EU growth rate of High-tech service sectors	Increase of value added at European level for service industries (+1.5% as an average with respect to the past)
A slow catching-up in R&D expenditure in CEECs	R&D / GDP in CEECs countries	+ 0.5% with respect to the post crisis period in Eastern countries
A slow catching-up in human capital in CEECs	Human capital in CEECs countries	+2% with respect to the post-crisis period in Eastern countries



Assumptions on institutional trends

Qualitative assumptions	Model's levers	Quantitative assumptions (targets in 2035)
Brexit from 2020	Regional input-output trade between UK NUTS2 and all other NUTS2 in Europe, applied as a distance for spillovers of growth Geographical distance between UK NUTS2 and all other NUTS2 in Europe	Trade distance increased to a maximum, limiting growth spillovers. Distance increased to a maximum, limiting growth spillovers.
Decrease in the cohesion policy expenditures	Expenditures of cohesion funds by NUTS2	National shares equal to the levels decided in the document of 29th May, maintaining regional shares as in the 2014-2020 programming period



The reference scenario: aggregate results

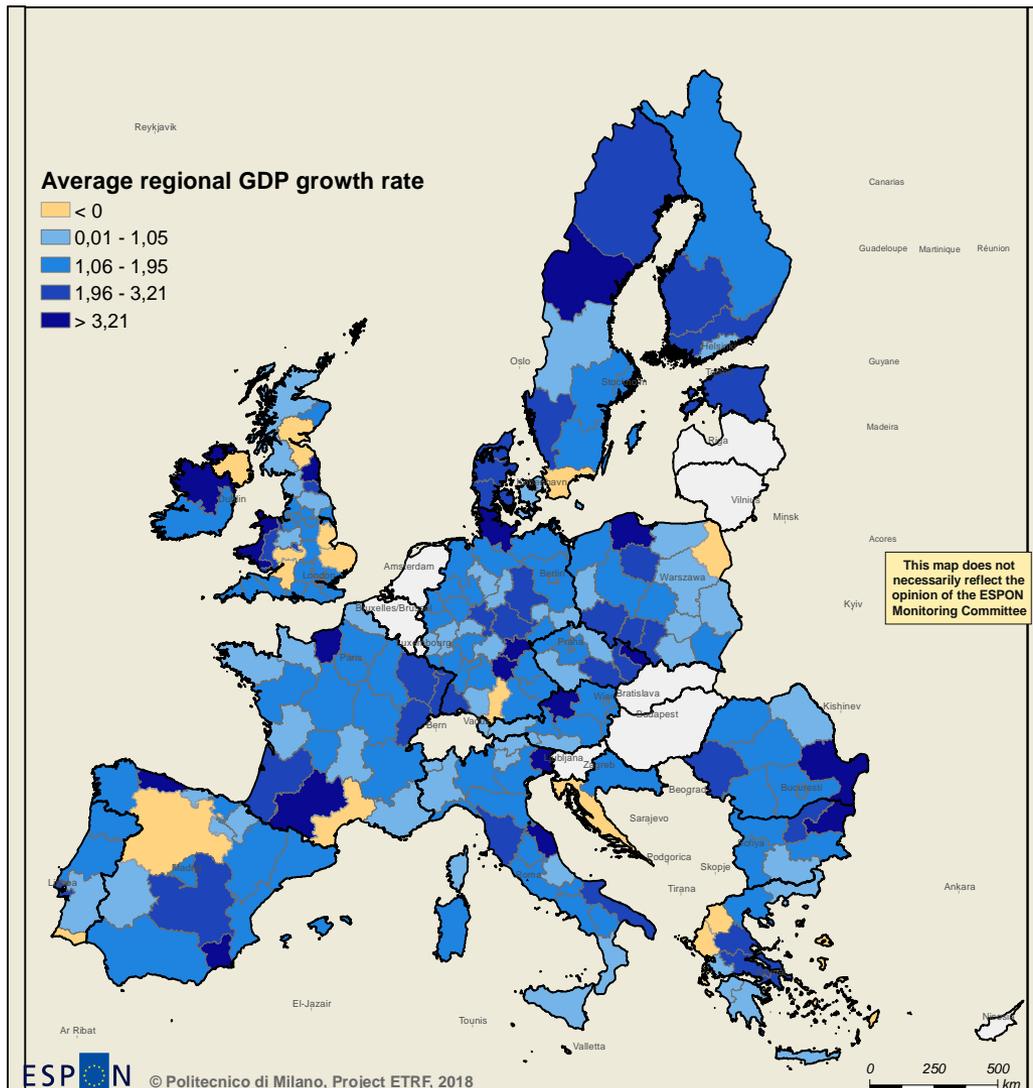
A stable relaunch after the crisis.

CEECs countries show still an average growth rate higher than Old 15 Countries (1,75% against 1.58%) but the distance has shrunk consistently.

Inside the Old 15 group, best performances in GDP are Luxembourg, Belgium, Denmark, The Netherlands and Austria, and inside the CEECs one by Estonia, Slovakia, Bulgaria, Hungary, Lithuania

	Average GDP growth rate	Average productivity growth rate	Average total employment growth rate
EU28	1.60	0.29	0.27
EU27 without UK	1.63	0.30	0.28
United Kingdom	1.40	-0.04	0.16
Old15	1.58	0.15	0.24
CEECs	1.75	0.63	0.38

The reference scenario: regional results

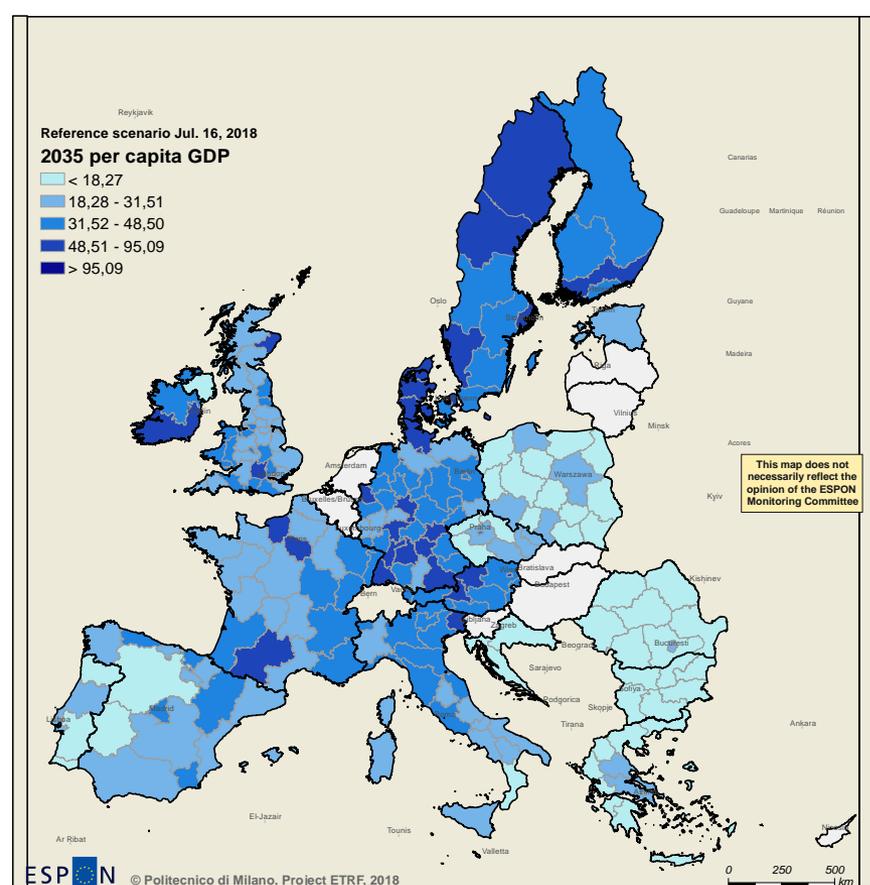
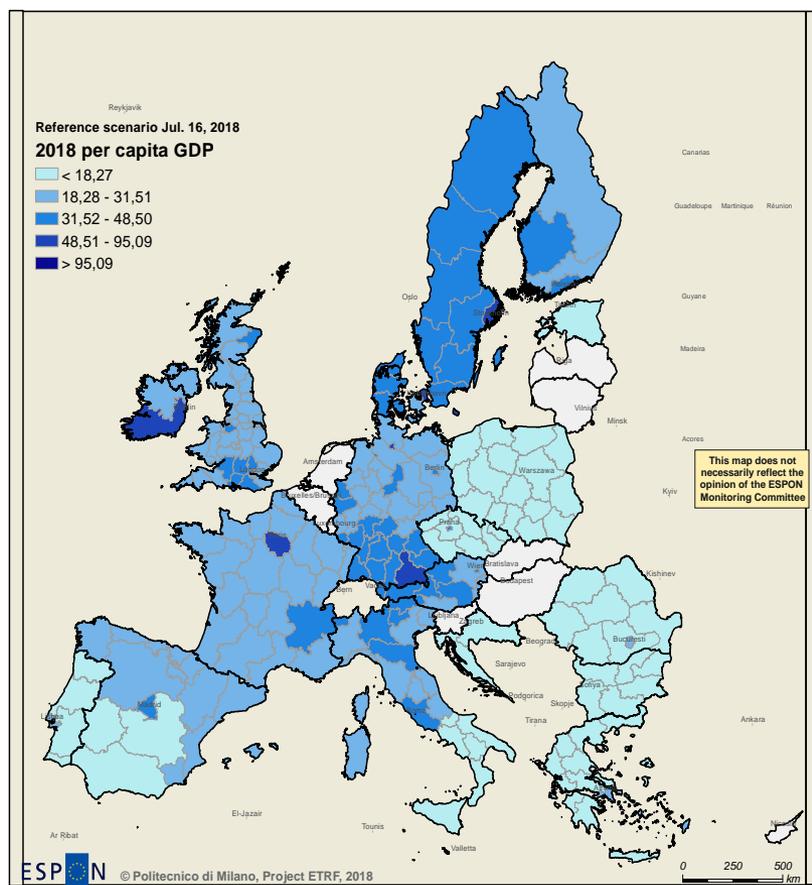


No more the macro-regional patterns that were present in the past (namely East-West clear differences and the North-South divide that emerged in the early stages of the crisis).

Some dualisms are still present in terms of regional GDP growth rates inside the single countries, and even more so in terms of per capita GDP levels



Per capita GDP: 2018 and 2035



EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

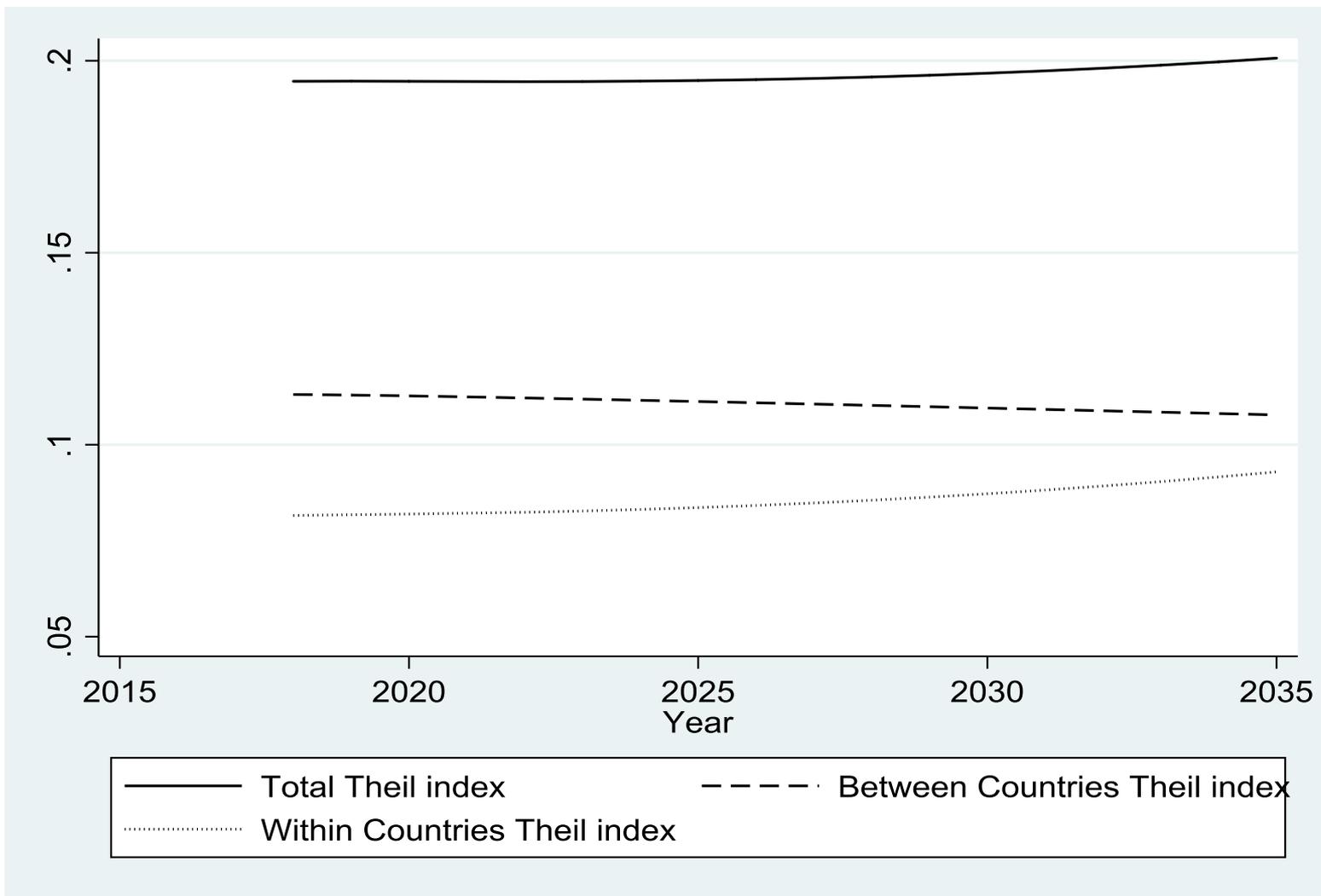
Regional level: NUTS2
Source: Politecnico di Milano, 2018
Origin of data: - © EuroGeographics Association for administrative boundaries

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

Regional level: NUTS
Source: Politecnico di Milano, 2018
Origin of data: - © EuroGeographics Association for administrative boundaries



Regional disparity trends





**THANK YOU VERY MUCH
FOR YOUR ATTENTION!**