The RHOMOLO Model

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RHOMOLO
Dynamic Spatial General Equilibrium Model

SIMULATED IMPACT on GDP GROWTH (AVERAGE)

Growth calculated is higher for the less developed regions. In the long run this could bring all EU regions to a similar level of wealth.

LESS DEVELOPED REGIONS

Growth calculated is between 0.1 and 1% GDP

TRANSITION REGIONS

Growth calculated is between 1 and 5% GDP

MORE DEVELOPED REGIONS

Between 0.1 and 1% GDP

induced effect

indirect effect

direct effect

investment
EU reference projections and scenarios  
Regionalisation (Nuts 2,3)  
Regional Performances Indicators Territorial Impact Assessment

REGIONS  
INDICATORS  
THEMATIC ANALYSES
RHOMOLO Modelling Framework

- RHOMOLO is the multi-sectoral economic model developed by DG JRC for the impact assessments of EU Policies;
- It shows how policy shocks may affect economic and social outcomes at the regional, country and sectoral level (deviation from baseline).

- It captures key determinants of the spatial distribution of economic activities:
  - Sector-composition: through regional I/O tables and Social Accounting Matrices;
  - Spatial configuration: through asymmetric sector- and region-pair-specific trade costs and spatial technological spillovers.
RHOMOLO Modelling Framework

- The domestic economy (which corresponds to the whole EU) consists of R-1 endogenous regions included into M countries. The Rest of the World is introduced in the model as an exogenous external institutional sector.

- Sector disaggregation: 10 tradable NACE rev.2 sectors (A, B-E, C, F, G-I, J, K-L, M-N, O-Q, R-U);

- Geographical coverage: 28 EU Member States + ROW ; 267 NUTS2 regions (French overseas territories are excluded).

- Final goods are consumed by Households, Governments and Investors whilst firms consume intermediate inputs.
Unique Sectoral and Geographical Granularity

1. Regional Input Output Tables
2. Territorial Accessibility via Existing Infrastructure
Horizontal Support to COM IA

- **ESIF**
- **EFSI & EIB Group**
- **Horizon 2020**
ESF 2014-2020

- ESF resources amount to 89 BL euros, 25% of the ECP total allocation (350 BL euros).

ESF-related Thematic Objectives (TOs):

- **TO8**: Promoting sustainable, equitable employment and supporting labour mobility.
- **TO9**: Promoting social inclusion, combating poverty and discrimination
- **TO10**: Investing in education, training and lifelong learning
- **TO11**: Improving the efficiency of the public administration

Over 70% allocated to the TO8 and TO10
Around 27% and 3-4% allocated to TO9 & TO11 respectively.
RHOMOLO Modelling Strategy and Simulation assumptions

A combination of labor productivity and government consumption shocks to capture both structural effects and short term demand side effects.

- **Labor productivity shock (mainly for TO8 & TO10):** additional school-year equivalents of training purchased with ESF investment per region and skill-group. Change in the average number of school-years embedded in the labour force due to the policy.

- **Government consumption shocks (mainly TO9):** only direct demand effects (it does not mean that these investments are not important for consumers' and society welfare).
Open Issues

- Representative agent models are not meant for analysing directly issues related to social inclusion/mobility and agent heterogeneity.

- We plan to extend the model to include endogenous participation decisions & household heterogeneity to assess distributional & social outcomes.

- Model simulations indicate potential effects. They are carried out in an unchanged policy setting – no control for ex-post implementation inefficiencies (e.g. low absorption rates, rent seeking behaviours, etc.).

- Simulations based on provisional commitments (not actual payments) data for the period 2014-2023.
ESF Provisional Allocation (2014-2023) - % GDP
ESF Investments & Impacts

Figure: Impact on GDP per TO (% deviation from baseline)

Impact on GDP 2023
ESF Investments & Impacts

GDP Impact per region group

- Less Developed
- Transition
- More Developed
ESF Multiplier Effects

Millions in euro invested

Millions in euro generated
Thank you!

More information on RHOMOLO:
https://ec.europa.eu/jrc/rhomolo

Web Simulation Tool:
http://rhomolo.jrc.ec.europa.eu