On the road to regional ‘Competitive Sustainability’
The role of the European structural funds

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The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.
Context, motivation and objectives

• Covid-19, Recovery and EU funds
  − Covid-19 outbreak drastically affected the EU economies
  − Crisis hit the world when the EU was concentrating efforts to achieve a more competitive sustainability economy
  − EU recovery package (Next Generation EU): emphasis on green and digital transition

• Objectives
  − Develop a new regional indicator (NUTS 2-level) to measure transition towards a competitive and sustainable economy
  − Assessing the rule of EU funds in supporting the transitions

• Scope: EU27 + UK (2008-2018)
Literature review and novelty of the study

• **Background theory:**
  – Theory on economic development (Lewis, 1954; Todaro and Smith, 2015; Herrendorf et al., 2014)
  – Determinants of long-run growth including capital accumulation, technological progress and investment in human capital (McMillan and Rodrik, 2011; Martins, 2019)

• **Novelty/contribution:**

<table>
<thead>
<tr>
<th>EXISTING STUDIES</th>
<th>PAPER NOVELTY</th>
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<tbody>
<tr>
<td>• Only one dimension of the transition (e.g. productivity)</td>
<td>• Two dimensions (productivity and sustainability)</td>
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<tr>
<td>• Mostly highly aggregated sectors like agriculture, industry and services</td>
<td>• High level of sector disaggregation</td>
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<tr>
<td>• Majority are based on country-level data</td>
<td>• Regional (NUTS 2) analysis</td>
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</table>
Methodological approach
Regional Competitive Sustainability (RCS) indicator

- **Regional Competitive Sustainability (RCS) indicator**
  
  - Data: Eurostat (2008-2018)
  
  - Coverage: EU27 + UK regions (NUTS 2 level) + 61 economic activities (NACE 2-digits)
  
  - Each activity \( j \) in region \( i \) is classified according to its relative positioning in terms of

    i) **Competitiveness**: “High (Low) productivity” if the economic activity shows an above- (below)-average performance within the country (productivity is proxied by wages and salaries per employee)

    ii) **Sustainability**: “Low (High) emissions intensity” if the economic activity is characterised by a below- (above)-median air emissions intensity (greenhouse gases emissions – GHG – per gross value added) (limitations only NACE-country data are available)
Methodological approach
Regional Competitive Sustainability (RCS) indicator

\[
RCS_{i,t} = \frac{Empl_{i,t}^{\text{CompSust}}}{Empl_{i,t}^{\text{Total}}}
\]

- \(Empl_{i,t}^{\text{CompSust}}\): sum of employment in activities that are simultaneously classified as “High productivity” and “Low emissions”
- \(Empl_{i,t}^{\text{Total}}\): total employment in a region
- \(RCS_{i,t}\): measures the proportion of employees working in those competitive and sustainable NACE 2-digits sectors in region \(i\) in time \(t\)

\[
RCS \text{ Transition} = RCST_{i,t} = \frac{Empl_{i,t}^{\text{CompSust}}}{Empl_{i,t}^{\text{Total}}} - \frac{Empl_{i,t-1}^{\text{CompSust}}}{Empl_{i,t-1}^{\text{Total}}}
\]
Methodological approach
Fixed effect model: Transition and EU structural funds relationship

\[ RCST_{i,t} = \beta_0 + \beta_1 \ln(\text{EUfundsStockPC}_{i,t-1}) + RCS_{i,t-1} + \beta_2 G_{Empl_{i,t}} + \beta_3 G_{ProdPC_{i,t}} + \mu_i + \tau_t + u_{i,t} \]

- Dependent variable: \( RCS \) Transition = \( RCST_{i,t} \)
- Explanatory variables:
  - Stock of EU funds (ERDF + ESF + CF) per capita in t-1 (EUfundsStockPC\(_{i,t-1}\))
  - RCS/RC/RS indicator level in t-1
  - Growth rates of regional employment (\( G_{Empl_{i,t}} \))
  - Growth rates of regional productivity (\( G_{ProdPC_{i,t}} \))
- Fixed regional effects (\( \mu_i \)), annual time fixed effects (\( \tau_t \)), and error term (\( u_{i,t} \))
- Data source: EUROSTAT and Cohesion data portal
Results and discussion
Regional Competitive Sustainability (RCS) indicator

Source: Own elaborations based on Eurostat data.
Results and discussion
Regional Competitive (RC) indicator

Source: Own elaborations based on Eurostat data.
Results and discussion
Regional Sustainability (RS) indicator

Source: Own elaborations based on Eurostat data.
Results and discussion
Where European Structural Funds were allocated?

- The EU structural funds mainly target the less developed regions of the EU with the objective of enhancing convergence and cohesion.
- The regions characterised by relatively lower values of the RCS indicator in 2008 are among the main beneficiaries of the funds.

Two-way Scatterplots: RCS, RC and RS indicators in 2008 beginning (vertical axis) versus stock of EU funds per employee (in logs) 2008-2018

Source: Own elaborations based on Eurostat data.
Results and discussion
Did the funds support the transition?

Table 1. Fixed Effects estimates, dependent variables: changes in the indicators - RCST (1), RCT (2), and RST (3)

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>RCST (1)</th>
<th>RCT (2)</th>
<th>RST (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCS/RC/RS Indicator_{t-1} (level)</td>
<td>-0.720*** (0.0371)</td>
<td>-0.678*** (0.0469)</td>
<td>-0.696*** (0.0354)</td>
</tr>
<tr>
<td>ln(EufundsStockPC_{it-1})</td>
<td>0.0427 (0.0340)</td>
<td>0.0545*** (0.0189)</td>
<td>0.0218* (0.0132)</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.604*** (0.189)</td>
<td>-1.024*** (0.0907)</td>
<td>-0.661*** (0.0543)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,504</td>
<td>2,504</td>
<td>2,504</td>
</tr>
<tr>
<td>Number of id</td>
<td>280</td>
<td>280</td>
<td>280</td>
</tr>
<tr>
<td>Wald test for joint significance</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>R²</td>
<td>0.397</td>
<td>0.340</td>
<td>0.372</td>
</tr>
</tbody>
</table>

Source: Own elaborations.
Note: Robust standard errors in parentheses.
Significance level: *** p<0.01, ** p<0.05, * p<0.1.
Dependent variable is calculated as ln(RCS_{it}) − ln(RCS_{it−1}) in order to interpret the coefficient of the EU funds variable as an elasticity.

Lower (higher) the shares of employees in competitive and/or sustainable sectors in a region, the more probable it is for that region to experience an increase (a decline) in the value of the indicator.

Results suggest that the injection of EU funds is helping regions to restructure their employment across sectors in order to become more competitive and sustainable within each country of the EU.
Conclusion

- **Regional competitive sustainability (share of employment)**
  - Strong regional heterogeneity
  - Higher value in Northern and Western Europe

- **European Structural Funds and support to transition**
  - Less developed regions of the EU show relatively worse values. Cohesion policy is targeting these regions
  - Funds have a positive effect on both pillars of the transition faced by the EU regions

*Next steps*
- Finding an alternative indicator to measure sustainable dimension
- To test other model specification (e.g. dynamic panel regression model)
- Explore spillover effect (spatial econometrics)
Thank you

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