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Counterfactual Methods for Regional and Urban Policy Evaluation SESSION - UNIV11C105

The effects of the European Structural Funds: What have we learned from counterfactual evaluations?

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MOTIVATIONS (1)

- The EU Structural and Cohesion Funds (EUF) represent one of the most important experiments of redistribution of resources within a continent. EUF aim to reduce disparities among EU Member States and regions countering any centrifugal forces

- This policy has often been regarded as a vast waste of resources, with high costs in terms of efficiency and, consequently, in economic growth. Therefore, these positions have unsurprisingly stimulated many researchers to evaluate the policy's effectiveness.

MOTIVATIONS (2)

- Nevertheless, this substantial amount of empirical studies has not brought to a general consensus on the effectiveness of EUF. (Dall'erba and Fang, 2017, Fiaschi et al, 2017 for recent reviews). The main reasons are:

  - limitations in data availability and comparability at regional level;

  - difficulties in isolating the impact of Regional Policy from the confounding effects induced by other factors.

MOTIVATIONS (3)

- The new dataset produced by DG Regio solves now the problem of data availability and comparability.
- However, different specifications of econometric models give different results, that are not robust to changes in covariates.
- The reason is that the “correct” specification, that includes all the relevant covariates, is unknown. Therefore, the estimated impact of Structural Funds depends on the included covariates and on how there are specified. Moreover, endogeneity problems affect several specifications.

SOLUTION: COUNTERFACTUAL METHODS

- They enables a more precise identification of the effects of the policy, regardless of the choice of the transmission channels through which the policy operates.
- Counterfactuals methods do not require a econometric “structural” model. Therefore it bypasses many of the concerns related to model specification, the number of covariates etc.;
- The approach resolves problems of causality, endogeneity and model specification. They are based on few assumptions, that are often testable, and have a high internal validity.

LIMITS OF COUNTERFACTUAL METHODS

1. Often is a local solution: Results cannot be extended to all regions (low external validity of the design);
2. We estimate only an average policy impact, without explaining the link between policy and regional outcome (it is a black box)
3. We estimate only an average policy impact, but sometimes we need something more (heterogeneous impact for size, policy's intensity etc.)

LITERATURE BASED ON COUNTERFACTUAL METHODS

Few papers, in the last 10 years. Basically two methods:

- Propensity Score matching or Generalized propensity score matching, based on matching by regions on observables
- Regression Discontinuity Design, that exploits the source of local randomness due to the sharp discontinuity in the assignment of different transfer intensity (75% of average GDP criterion).

LITERATURE BASED ON GPS

- *Mohl and Hagen (2010),* using the method of 'generalized propensity score' (GPS) and NUTS2, show that EU Structural Funds payments "have a positive, but not statistically significant, impact on EU regions' growth rates";

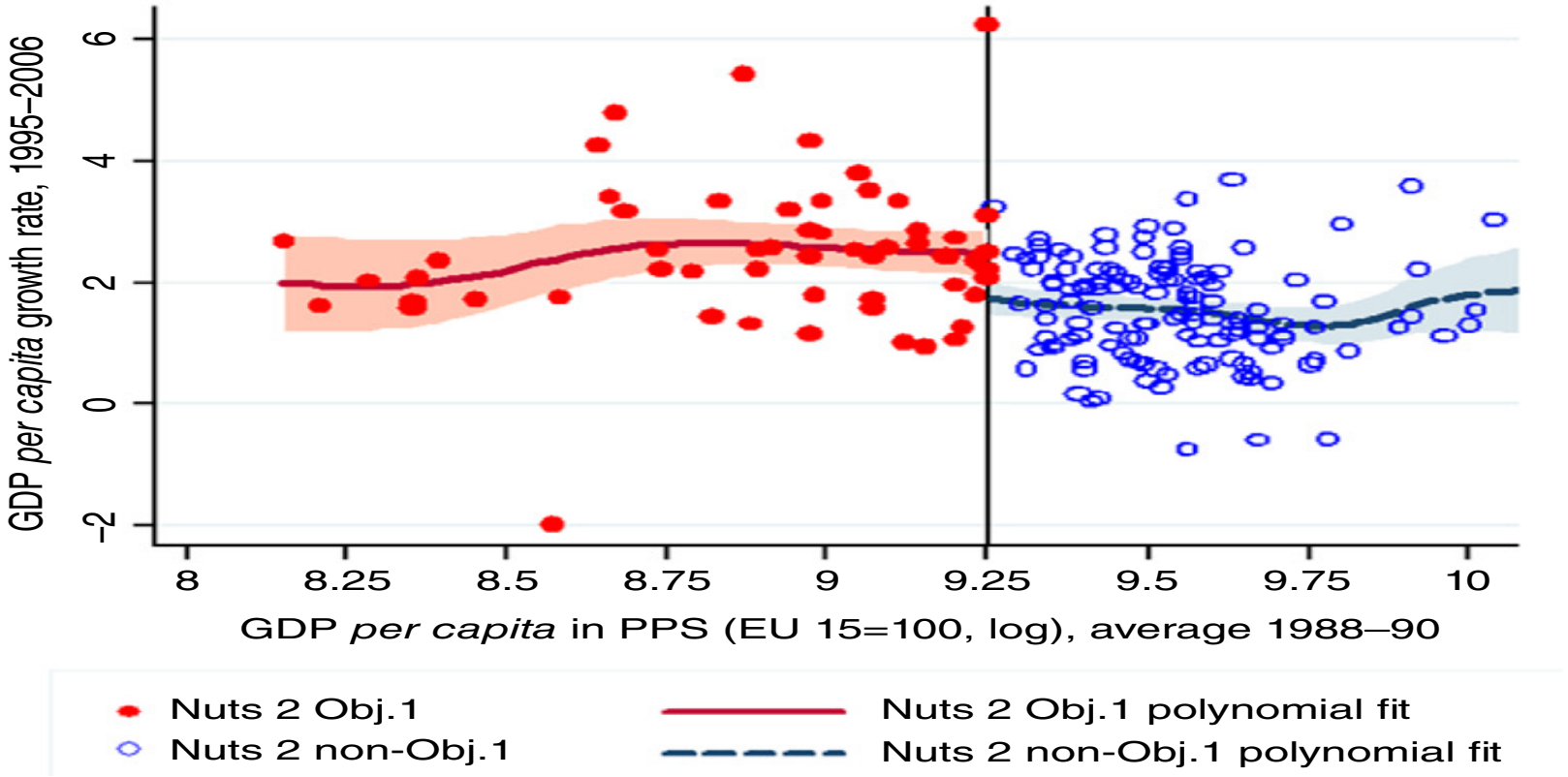
- *Becker et al. (2012),* using again the GPS but applying it to NUTS3 regions, They find that, overall, EU transfers enable faster growth in the recipient regions

- *Becker et al. (2016)* investigate the 2007-2013 programming period using GPS .Their findings are generally positive.

LITERATURE BASED ON RDD

- *Becker et al. (2010),* using fuzzy RDD and NUTS2, find an effect of 1,6% per year.
- *Pellegrini Terribile Tarola Muccigrosso Busillo (2013),* using NUTS2 and sharp RDD, show that EU Structural Funds payments "have a positive impact, albeit modest, on EU regions' growth rates" (0,6-0,9% per year);
- *Becker et al. (2013)* Using the concept of HLATE find a positive impact that depends on the Absorptive Capacity of each regions
- *Cerqua and Pellegrini (forthcoming)* using RDD with continuous treatment find a positive, modest effect depending on SF's intensity

b. Level in PPS (log)



. A comparison of *per capita* GDP growth rates: Treated and non-treated regions 1995

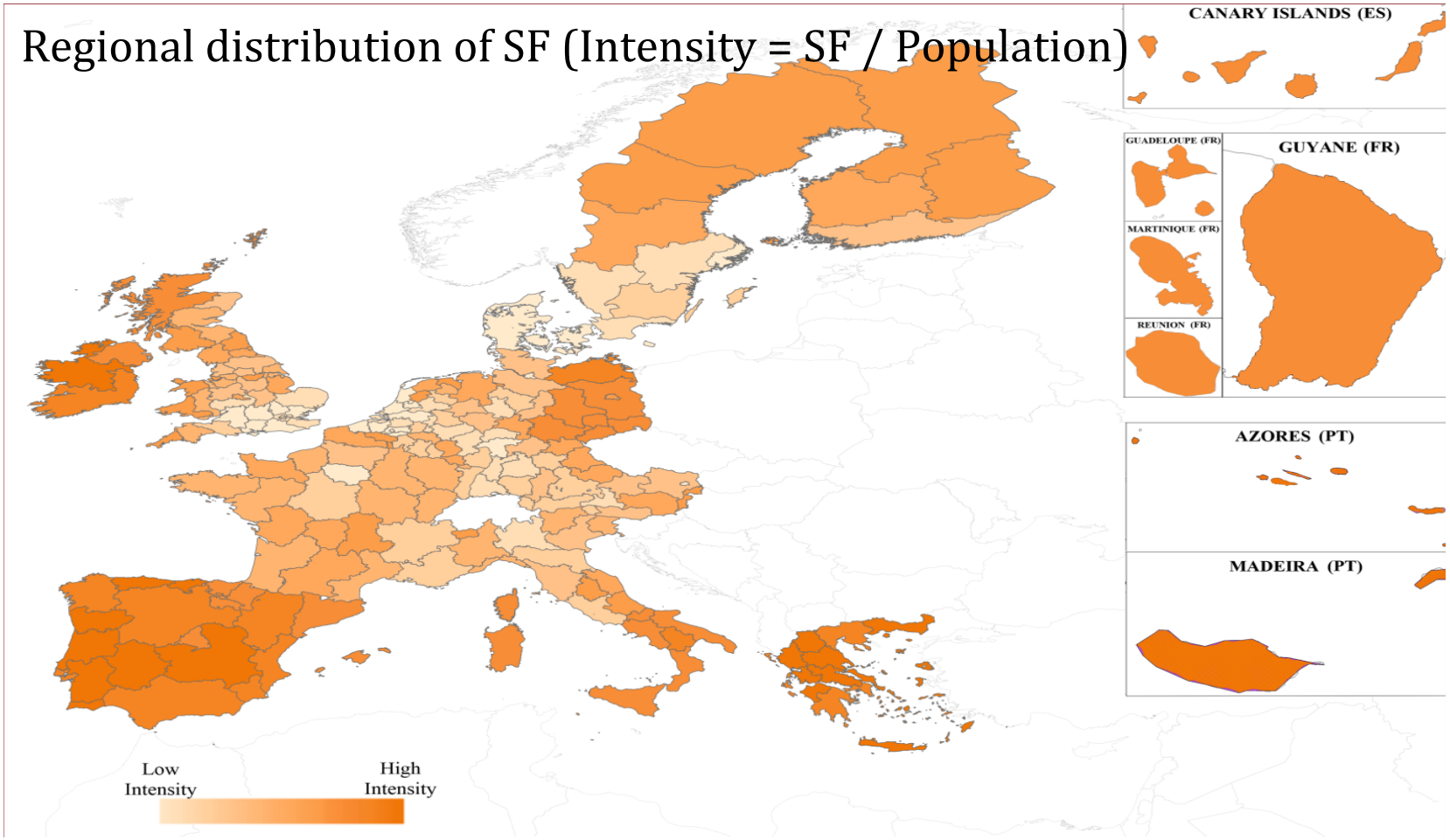
SUMMARY OF LITERATURE ON SF's AVERAGE IMPACT

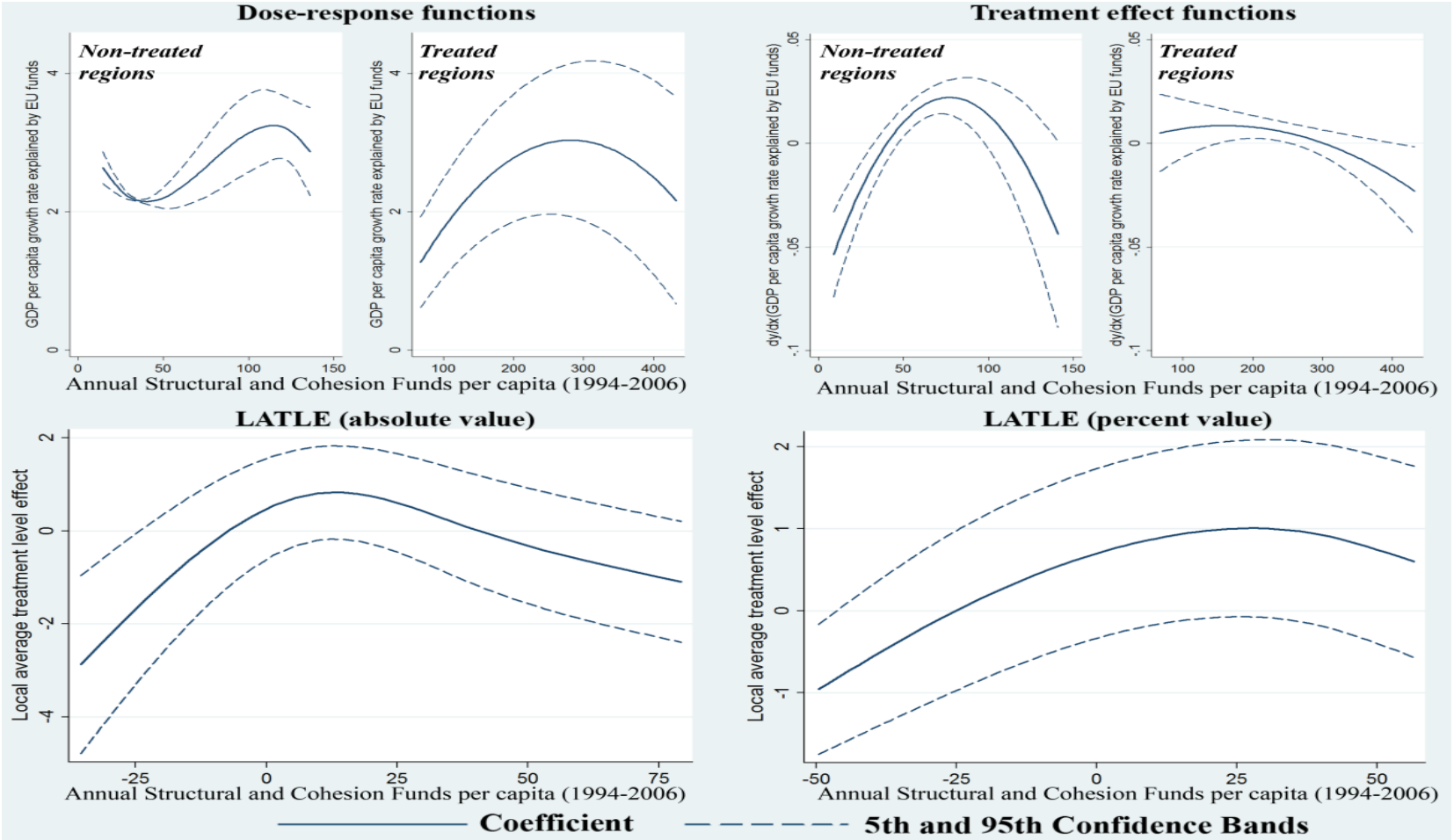
1. The average impact is positive, often statistically significant but modest. The multiplier can be 1 - 1.2

2. Strong heterogeneity of the effects. This is the new field of analysis. Heterogeneity can depend on:

- Intensity of treatment (amount of SF by person and year)
- Absorptive Capacity (Administrative capacity, human cap.)
- Spatial effects (spillover between regions)

Regional distribution of SF (Intensity = SF / Population)




Dose-response functions
Non-treated regions
Treated regions
GDP per capita growth rate explained by EU funds
Annual Structural and Cohesion Funds per capita (1994-2006)
Treatment effect functions
dy/dx(GDP per capita growth rate explained by EU funds)
LATLE (absolute value)
Local average treatment level effect
LATLE (percent value)
Coefficient
5th and 95th Confidence Bands

INTENSITY

- The most interesting aspect is that the estimated conditional intensity-growth function is concave, and presents a maximum value, estimated in around €300-€345 per capita.

- After this value, the marginal efficiency of transfers is negative: the larger the per capita transfers, the smaller the regional growth rate. In our paper we find 10 regions, which account for a share of 16% of the total SF, which received more than €345.

- Our and Becker's analysis shows that there is room for improving the allocation of SF transfers, reducing the transfers to regions where the transfer intensity is above the maximum desirable level.

ABSORPTIVE CAPACITY

- Becker shows that the heterogeneity of recipient regions with respect to their absorptive capacity matters considerably.
- Both measures of a region's absorptive capacity, the human capital endowment of the workforce and quality of government, show similar patterns.
- While the treatment effect is insignificant for regions with a very low level of absorptive capacity, it exceeds the average treatment effect for regions with above-average absorptive capacity. Only about 30% of the recipient regions display sufficient levels of absorptive capacity to turn the transfers into economic growth.

SPATIAL SPILLOVERS

- Regional economic development depends not only on the regional characteristics of production factors, but also on the features of neighboring regions, the spatial connectivity structure of the regions, and the strength of spatial dependence (LeSage and Fischer, 2008).
- Generally, the presence of a spatial interaction implies that subsidies in a region also affect also contiguous regions. In this case, the standard method used for the counterfactual evaluation cannot be used: the stable unit treatment value assumption (SUTVA) in the Rubin causal model is not valid and other econometric evaluation methods should be used in order to detect the consistent policy impact in the presence of spatial dependence. (De Castris and Pellegrini, 2015).

SPATIAL SPILLOVERS (2)

- A recent paper by De Castris and Pellegrini (2017) shows:
- Spatial spillovers across regions appear to be an important multiplicative factor that increase (or decrease) the average impact of the European Regional Policy but also increase (or decrease) the impact heterogeneity between regions with a different level of per capita GDP.
- For the Southern European Regions in Objective 1, spatial spillovers are lower than the average. The reason is that these regions are mainly in a spatial cluster of less developed regions, and the spatial interactions have only a less-than-average impact on the neighbors' growth. The effect is, on average, equal to -0,3% growth per year .

Thank you for your attention

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