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Counterfactual methods triangulation used in impact evaluation of enterprise development in Eastern Poland

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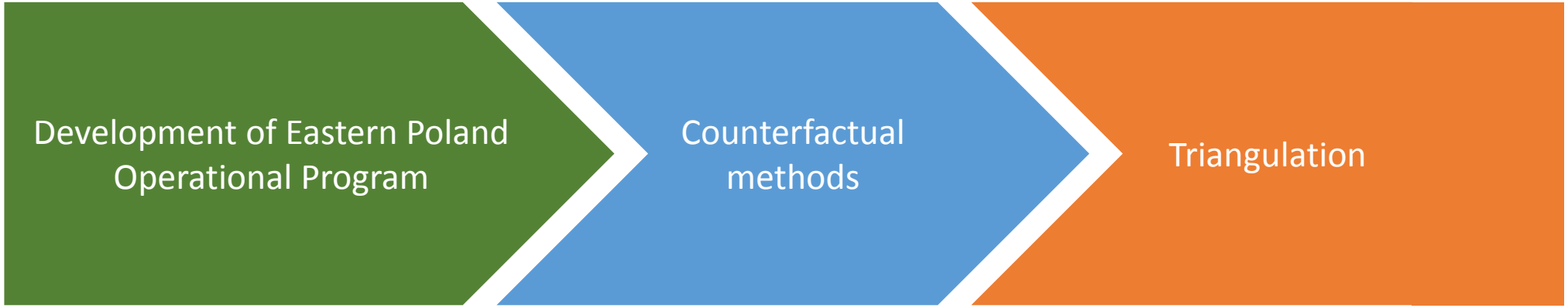
Plan


Development of Eastern Poland Operational Program
Counterfactual methods
Triangulation

PO RPW

- Ex-post evaluation of Development of Eastern Poland Operational Program (PO RPW) 2007–2013 impact on entrepreneurship development in Eastern Poland.
- Goals:
  - to evaluate the fulfillment of PO RPW goals;
  - evaluation of added value that could be generated by other Cohesion Policy funds in the field of entrepreneurship development

Priority Axis 1 – Activities:

- I.1 „Infrastruktura uczelni”
- I.2 „Instrumenty inżynierii finansowej”
- I.3 „Wspieranie innowacji”
- I.4 „Promocja i współpraca”

Method

Desk research	Quantitative study	Qualitative study
• Current research review • Literature, reports, documents review	• CATI/CAWI with Action 1.2 beneficiaries • Counterfactual analysis • Macroeconomical models	• Expert panel • IDI with IZ & IP representatives • IDI with NUTS4 representatives • ITI with representatives of beneficiaries

But:

- Counterfactual analysis was also used to select NUTS4 for qualitative fieldwork (IDI with NUTS4 representatives).

Definition

- European Commission:

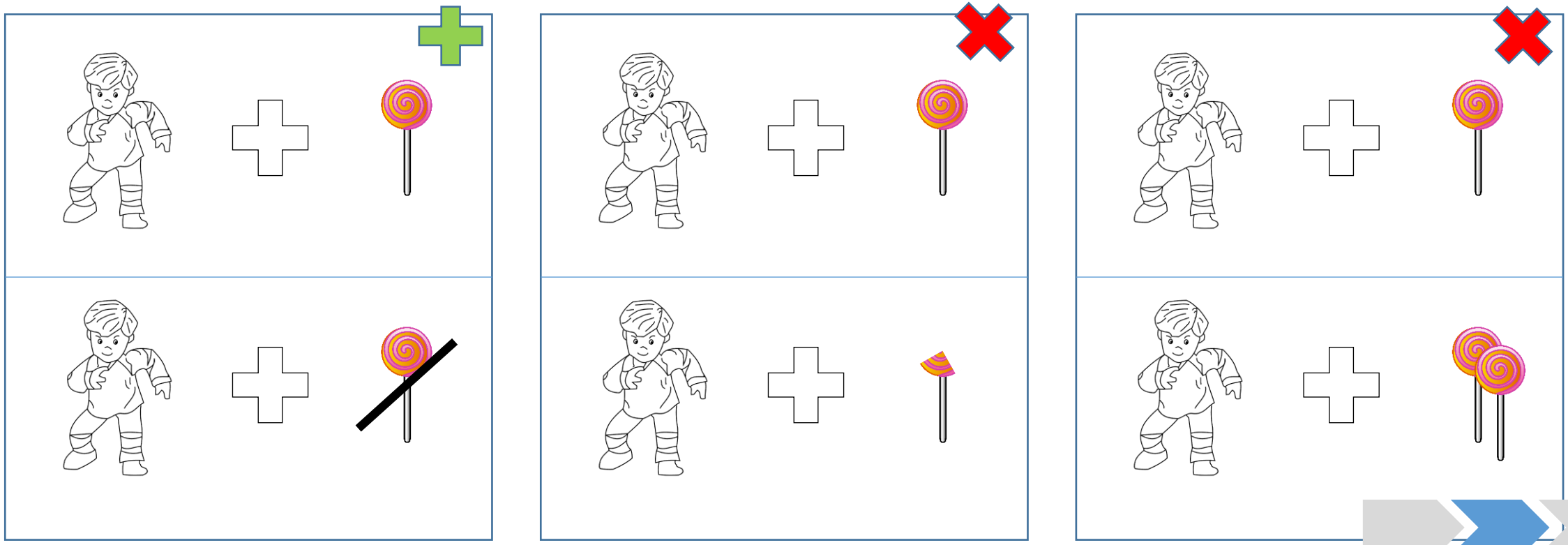
„In its simplest form, counterfactual impact evaluation (CIE) is a method of comparison which involves comparing the outcomes of interest of those having benefitted from a policy or programme (the "treated group") with those of a group similar in all respects to the treatment group (the "comparison/control group"), the only difference being that the comparison/control group has not been exposed to the policy or programme. **The comparison group provides information on "what would have happened to the members subject to the intervention had they not been exposed to it", the counterfactual case.**"

- Saul Kripke

„The **'counterfactual situation'** could be thought of as a **miniworld or a ministate**, restricted to features of the world **relevant to the problem at hand**."

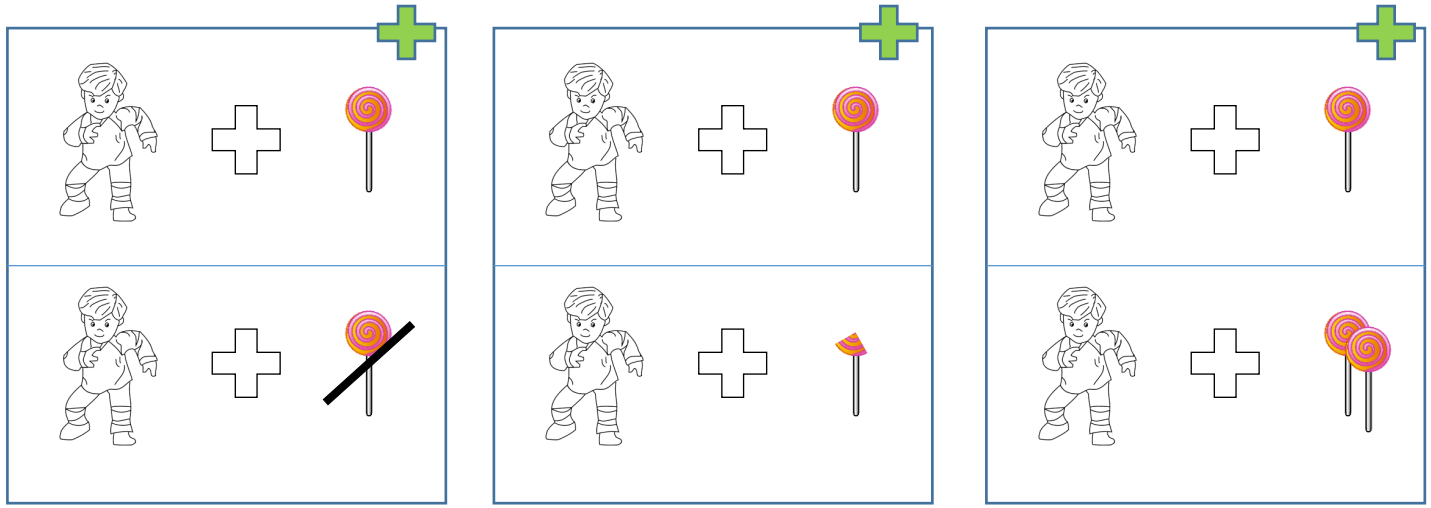
Definition – closer look

The comparison group provides information on **“what would have happened to the members subject to the intervention had they not been exposed to it”**, the counterfactual case.

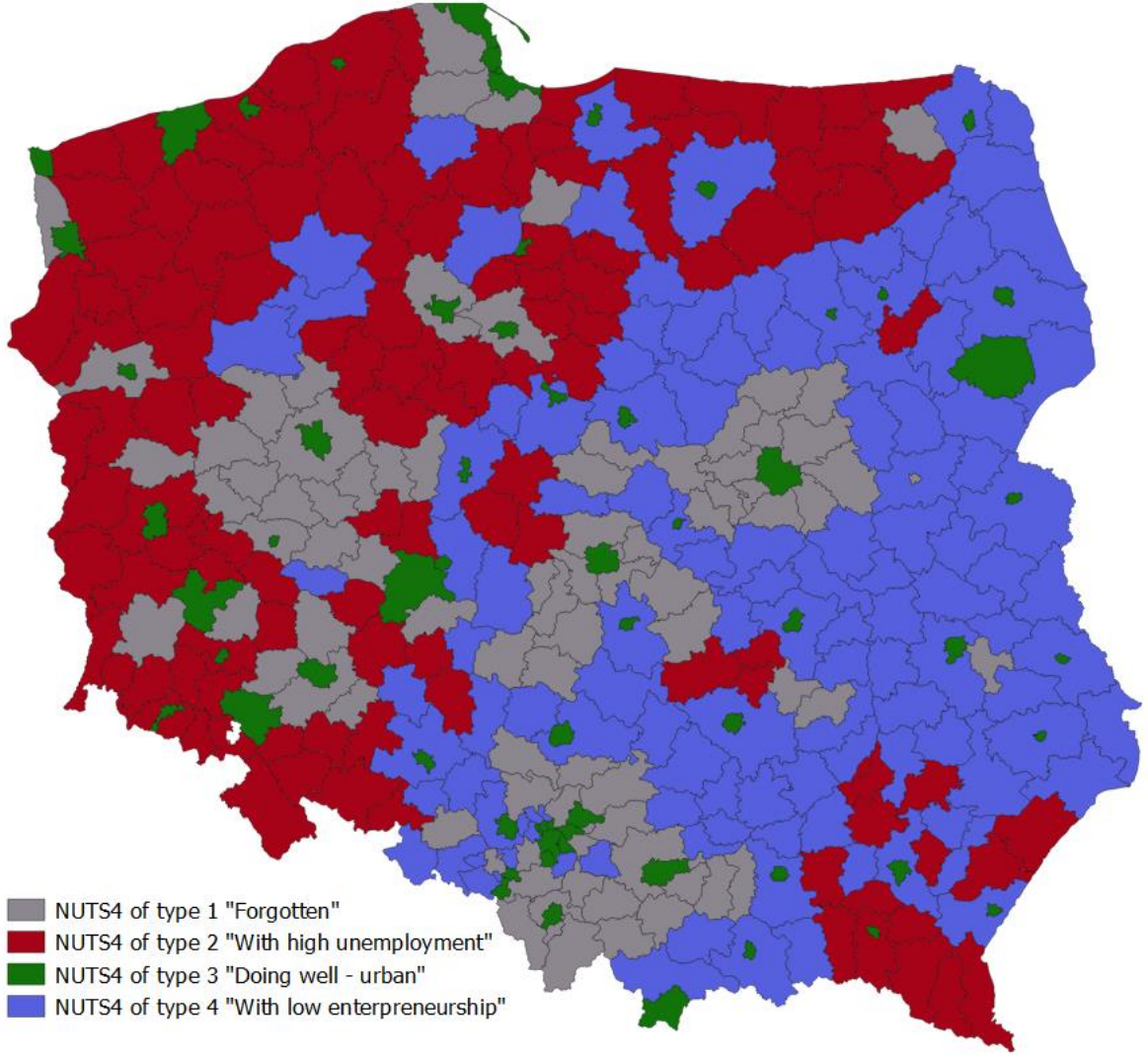


Why?

- PSM model is based on logistic regression, where dependent variable is either 0/1 (classical model) or within a broader set of discreet levels (multinomial).
- 0/1 dependent variable fits well the approach **“what would have happened to the members subject to the intervention had they not been exposed to it”**.
- But PSM **doesn’t have to** be limited to 0/1 situations.



Problem



- The problem starts when every unit underwent some type of intervention.
- This is the case of cohesion policy evaluation.
- In our case unit of interest was NUTS4.
- Every NUTS4 in Poland (and probably every NUTS4 in UE) received suport from Structural Funds.
- Does it mean there is no space for counterfactual evaluation?

Answer

Of course there is

Method

Hierarchical clustering – reduce database to several segments/clusters

Why hierarchical? It can extract small, specific segments (eg. urban NUTS4)

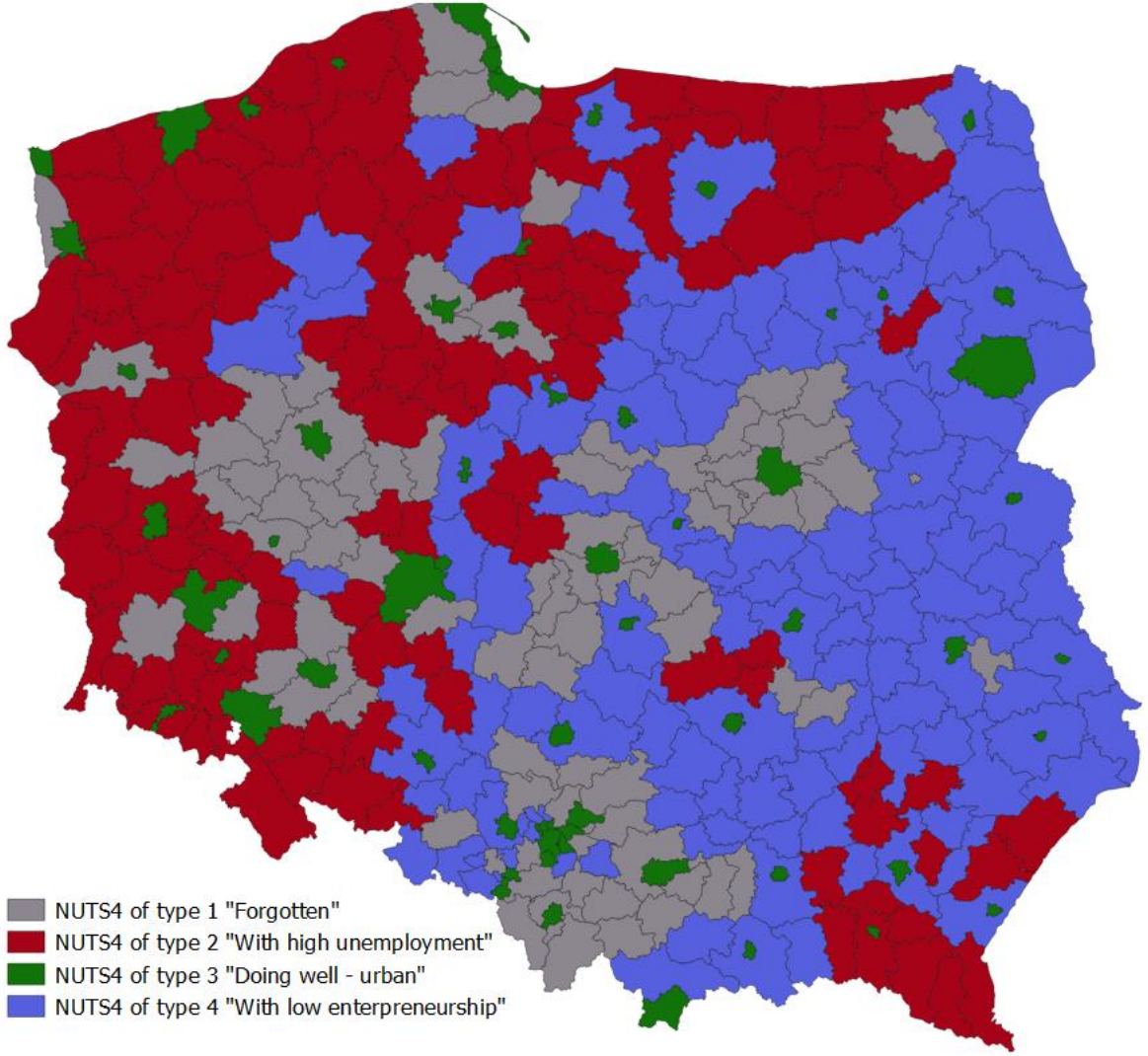
Fuzzy clustering – to change 0/1 cluster membership to cluster membership probability

How? By discriminant analysis or as a aproduct of proximity matrix developed during hierarchical clustering

Propensity scores – as a similiarity measure of probabilites of cluster membership

Remark: Segmentation should be performed on data gathered BEFORE intervention, because we need to define similiarities before the intervention

Results (in short)



4 segments:

- Type 1 „**Forgotten**" – units near big cities, underdeveloped
- Type 2 „**With high unemployment**"
- Type 3 „**Doing well – urban**"
- Type 4 „**With low enterpreneurship**"

- Net effect was calculated for each segment separately.

Triangulation

- In fact we use two counterfactual methods:
  - Mentioned above SPSM
  - Classical PSM method
- Classical PSM were used in assesing net effect of Development of Eastern Poland Operational Program (**PO RPW**) in comparison to other structural funds available in the same time
- SPSM were used to evaluate net effect of PO RPW inside of Eastern Poland Macroregion

Triangulation

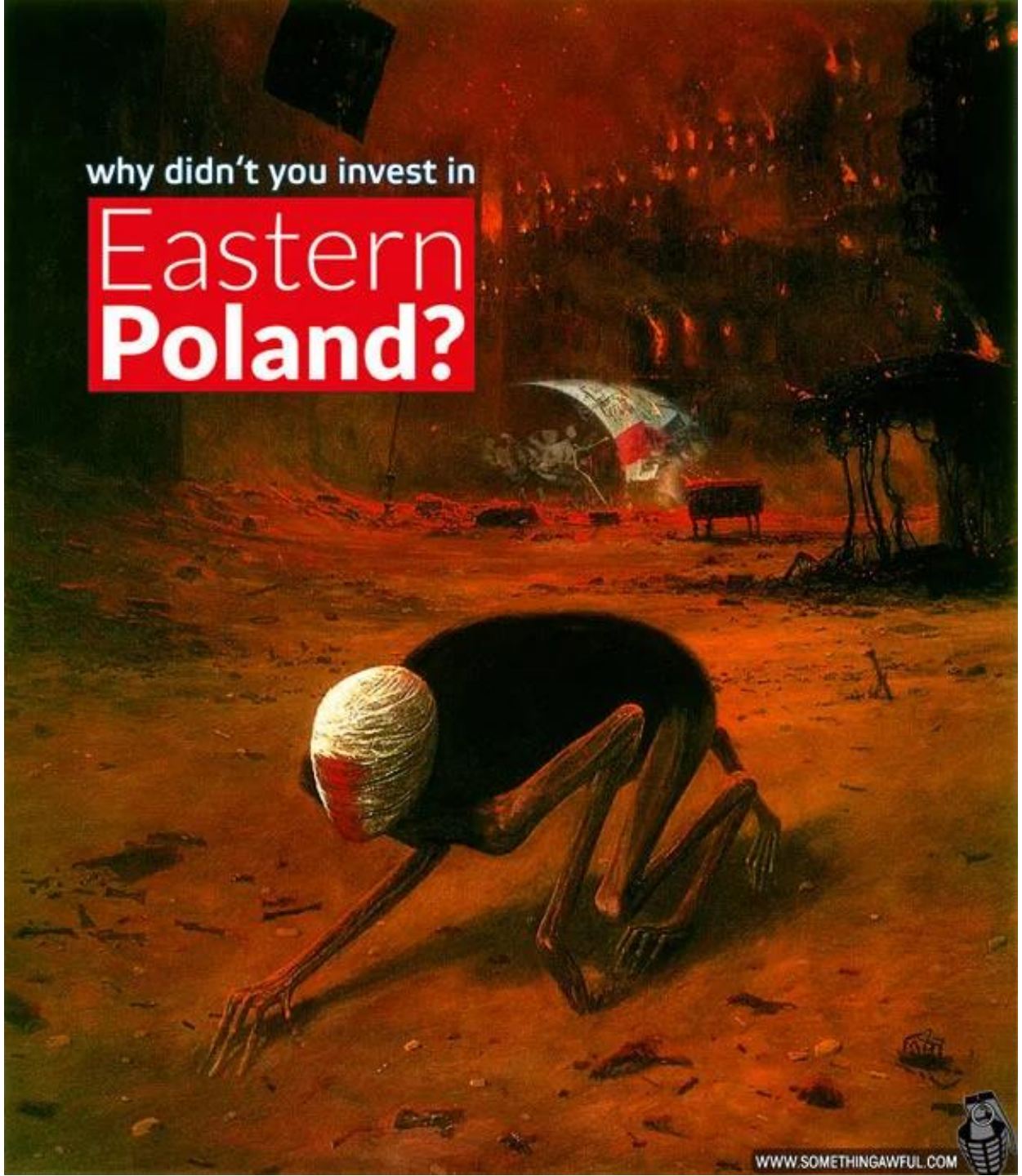
- Furthermore, SPSM were used to set IDI with NUTS4 representatives in 4 types (segments) of NUTS4 units.
- After segmentation pairs of NUTS4 were estabilished. Each pair contained NUTS4 with highest and lowest PO RPW funds
- In this case, counterfactual analysis aimed selection of most similiar at beginning, but unequally treated (in case of PO RPW funds) later.

Advantages of SPSM

- It allows for **analysis in specific segments**, taking into account eg. difference in needs for infrastructure between urban and large rural NUTS4.
- The analysis on the whole sample is still possible.
- We can calculate indicators of synergy / cannibalisation to show the difference between net effect generated by each of the funds separately and net effect of all funds together.

Further developments

- **Implementing spatial analysis**. Right now every NUTS4 is treated as an island, with no connection to other units.
- **Threshold problem**. Counerfactual analysis treats impact of every Euro in the same way. It doesn't distinguish between the situation when one unit gets 1 million and the other 0 and the situation when one unit gets 20 millions and the other 19 millions.
- Analysis are not self-explanatory. Counterfactual analysis can't say if net effect is high or low. **Macroeconomical models** can be used as additional explanatory layer.



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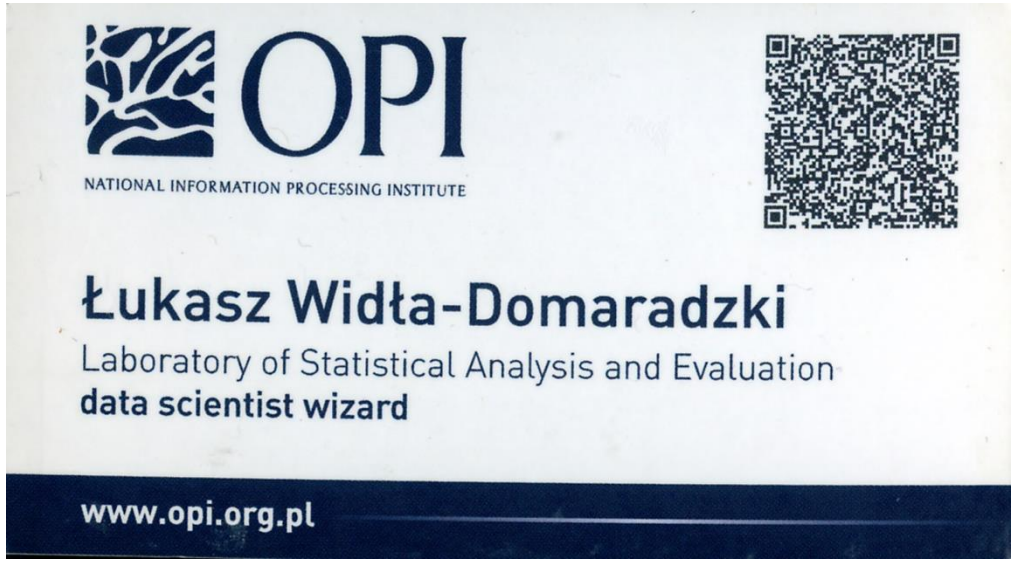

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