

# Evaluation Helpdesk

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## Case study of a counterfactual evaluation

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## Case study:

- 'Are the subsidies to private capital useful? A Multiple Regression Discontinuity Design Approach" – Augusto Cerqua and Guido Pellegrini
- Published in 2011
- Example of a counterfactual impact evaluation applied to a business support programme in Italy which was co-financed by the ERDF in the 1994-1999 period

## Policy evaluated

- **Content:** business grants provided under Law 488/92 to build new production units or to expand production capacity
- **Aim:** to increase employment and productivity and to improve ecological impact – main measure for reducing regional disparities
- **Input:** Over years 1996-2006, over EUR 23 billion allocated to some 44,000 projects most of them in Mezzogiorno – i.e. in Objective 1 – Convergence – regions
- **Allocation:** Grants allocated through series of calls for tender (competitive auction) based on:
  - Share of funding provided by company
  - Number of jobs created
  - Amount of subsidy requested
  - Priorities of region
  - Environmental impact of project

## Policy evaluated

- Tendering process took place in each of southern Italian regions
- In each region, companies ranked according to score on above criteria. Grants allocated until funding exhausted
- Law 488/92 auctions issued on yearly basis – analysis relates to period 1995-2001 and focuses on 3 of 4 auctions conducted up to 2001 in the different regions
- Feature of policy - condition of receipt of Law 489/92 support that firms applying have to give up other public subsidies – so can assume firms given grants received no other subsidies at time
- And any other subsidies received after auction likely to be small because of concentration of business support on Law 488/92

## Evaluation approach

- If grants allocated randomly, impact of subsidies could be estimated by simple difference between outcomes for treated and not treated firms for each auction
- But not random so need a control group - data available for firms applying for grants but unsuccessful = convenient control group
- Show propensity to invest similar to that of treated firms and similar other characteristics
- For each auction, as many rankings of firms in terms of selection criteria as number of regions – cut-off point differs for each
- 2 steps to estimate policy effect:
  - estimate treatment effect for each ranking
  - pool treatment effects to get overall effect of policy

## Method used

- **Regression Discontinuity Design (RDD)** – consists of comparing the companies just above the cut-off point in terms of criteria applied (i.e. the treated group) with those just below it (i.e. the control group)
- Latter = those who just failed to obtain grants because their aggregate score on criteria was slightly less than those which obtained them
- This comparison made for each of the auctions in each of the regions
- Only firms in each auction and in each region compared with firms in that auction and region receiving support – assumption that they form a suitable control group
- Approach labelled **Multiple Rankings Regression Discontinuity Design (MRDD)**

## Data used and period covered

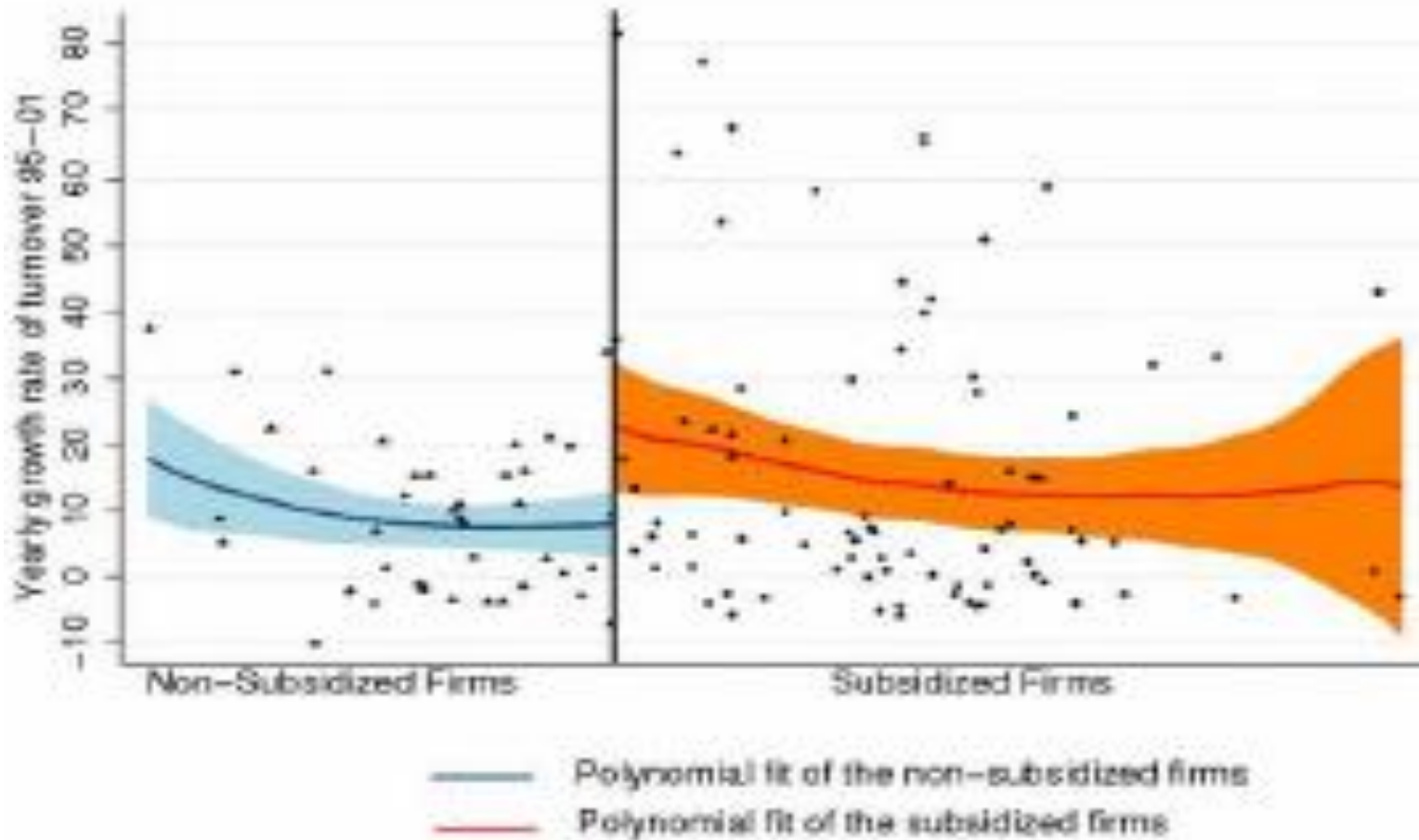
- Administrative data available from Ministry of Industry on the criteria used to rank firms in terms of suitability for receiving grants
- But contain no economic or financial data
- So merged with company financial statement data using fiscal and number of commerce codes as firm identifiers
- Financial-statement data for 6-year period, 1995 to 2001
- Data on 519 financed projects and 1525 non-financed ones for 1996 to 1999 – covers 2nd, 3rd and 4th auctions
- Merged data set covers period 1995–2001 for 2,044 firms that responded to calls for tender in South of Italy
- Enables pre-treatment period to be included as well as performance in 2 years after last set of grants received

## Measurement of policy effect

- Effect of grant receipt (treatment) measured in terms of two performance indicators:
  - Annual growth rate of investment as % of turnover
  - Annual growth rate of turnover
- To carry out meaningful econometric analysis for each ranking – need minimum of 10 subsidised + 10 non-subsidised observations
- Makes it impossible to include Basilicata and Molise, Sicily in 2nd auction and Abruzzi, Calabria and Sardinia in 4th auction
- 14 rankings in total analysed
- Simple way to assess effect of grants is to plot relationship between outcome indicators and 'forcing variable' – sum of indicators or criteria used to determine grant receipt
- Lee and Lemieux (2010): if no visual evidence of discontinuity – unlikely most sophisticated regression methods will find one



## Relationship between growth rate of turnover and selection criteria in Calabria in 2<sup>nd</sup> auction



## Results

- Both simple comparison of means and regression results indicate subsidised firms, on average, invested more and grew faster than others
- Effect statistically significant - presence of discontinuity at cut-off point supported by every graph (2x14)- i.e. for every auction and region analysed
- Scale of effect estimated depends on choice of 'bandwidth' - number of firms either side of cut-off point included in estimation
- Choice = balance between precision (more observations increases reliability of estimates) and bias (wider the bandwidth, larger the difference in characteristics between treated and not treated firms)

## Sensitivity tests

- Large number of tests carried out to check validity of results
- Evaluators not always so rigorous in this respect
- Aim: to see if possible to disprove findings:
  - by varying bandwidth, to include more or fewer firms
  - by examining whether other discontinuities exist apart from around policy cut-off
  - by trying to identify other factors which might have caused effect apart from policy
- Sensitivity tests fail to invalidate findings
- **Conclusion:** Law 488.92 had a significant effect on investment and growth performance of firms supported

Thank you  
for  
your attention