

Evaluation of Animal Welfare Outcomes of RDP-Measures for Dairy Cows

Methodological and Data Issues

Background & Objectives

- For assessing the impacts of Rural Development Programmes (RDP) of the Common Agricultural Policy, the European Union recommends a combination of propensity score matching and the difference in differences method (conditional DID approach) (European Commission 2018).
- This approach, however, does not take into account the differential timing of support within a programming period.
- To overcome this problem, we applied a flexible conditional difference-in-differences approach (Dettmann et al. 2020), which has not yet been employed in this context.
- We apply this approach to analyse the effect of various measures on animal welfare of dairy cows in the federal state of North-Rhine Westphalia for the period 2007-2013

The approach

- $Effect (ATT) = (Y_{TG}^{2013} - Y_{TG}^{2007}) - (Y_{CG}^{2013} - Y_{CG}^{2007})$
- ⇒ The DID approach removes confounders, which do not change over time.
- Relies on parallel trend assumption, which is not testable.
- Increase the likelihood of parallel trends by including covariates via matching.
- Dettmann et al. (2020) modified the conditional DID approach to consider individual treatment phases (i.e. an exact definition of the points in time an individual is compared to its 'statistical twin').

Conclusions

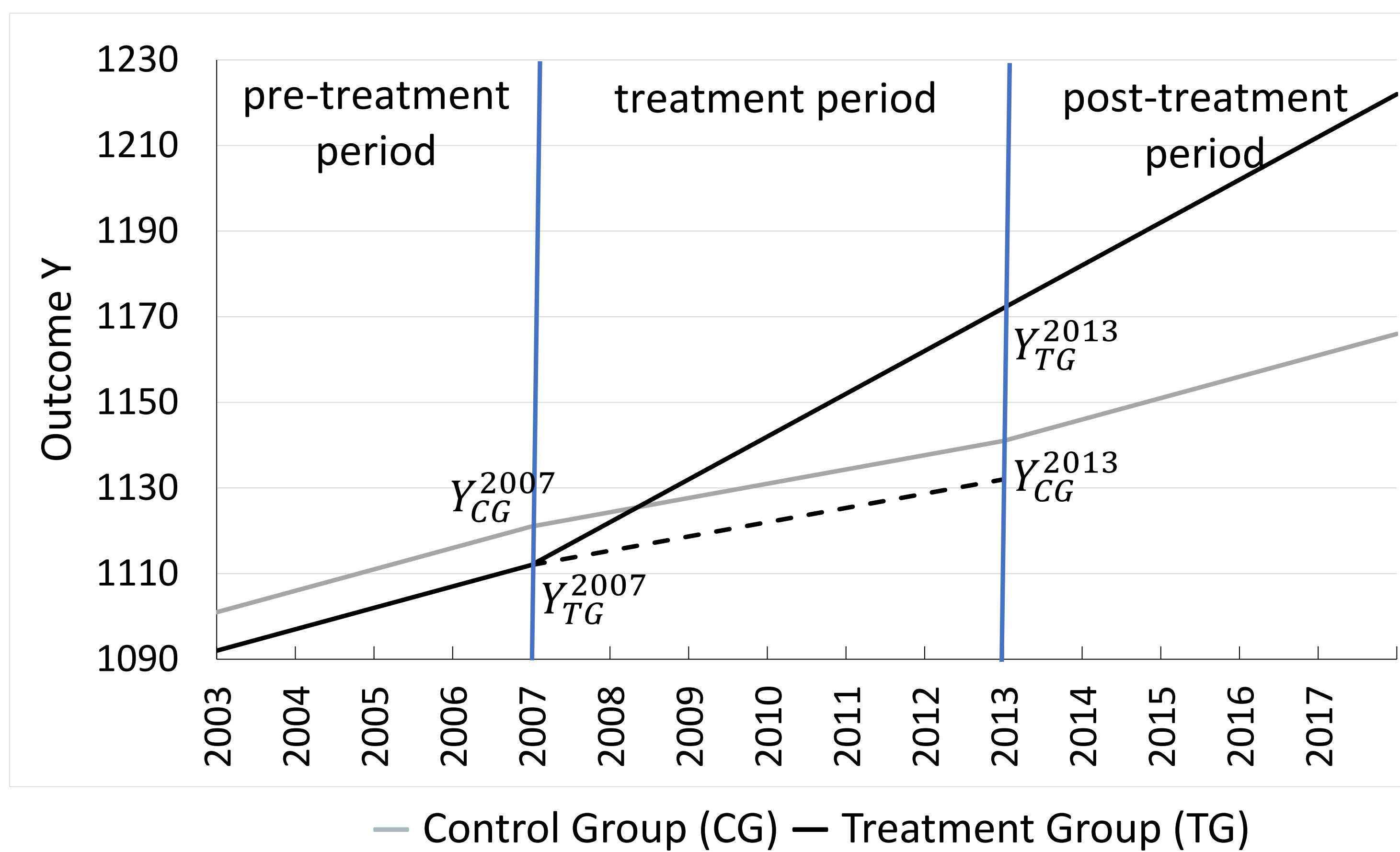
- Compared to the recommended approach by the EU, the flexible conditional DID approach is more suitable to represent the variation in the timing of the implementation and the length of the effect of support measures.
- It should hence lead to estimates closer to the "true" effect.
- However, parallel trend assumption still might not hold leading to biased estimates.

⇒ Pre-treatment data is absolutely necessary to visually inspect pre-treatment trends.

Data

- From cattle register data we calculated the animal welfare indicators mortality and longevity.
- This data was then combined with information concerning farm characteristics and programme participation.
- 3 treatment groups: Farms participating in the measures Grazing, Litter or Farm Investment Support (FIS)
- Control group: Farms not participating
- Herd size, composition of the herd concerning breeds, agricultural and pasture area as well location of the farm were used as covariates in the matching procedure.
- To establish causality, we applied a flexible conditional difference-in-differences (DID) approach.

Figure 1: The DID approach



- The administrative data used has been collected for many years allowing the analysis of pre-treatment trends.
- But data handling is time consuming and complex.
- Moreover, access and the combination of data sets is very restricted due to legal concerns.

⇒ Administrative bodies and managing authorities should hence take measures to facilitate access to these data sets.