

# Problem Set 3 - Treatment Effects

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## Matching

This problem replicates an exercise by Dehejia and Wahbia ([JASA 1999](#), [ReStat 2002](#)) exploring non-experimental treatment effects from the Lalonde ([AER 1986](#)) data.

All of the referenced datasets can be downloaded at [Rajeev Dehejia's website](#). See the descriptions for variable names if you use the text files.

Start with the experimental data. Use the DW sample ( `nswre74_[group].txt` or `nsw_dw.dta` ).

1. Test for balance across the treatment and control group.
2. Estimate the main treatment effect of the training program on 1978 earnings ( `re78` ).  
Estimate the model with and without controls. Do the covariates matter here?

Now estimate the treatment effect using a different control group. First, drop the NSW control group. Then append the PSID sample ( `psid_controls.txt` or `.dta` ), none of which received the treatment.

3. Test for balance between the treatment group and this new control group.
4. Estimate the effect of the training with and without controls.
5. Construct a propensity score for the treatment. Plot the propensity score across the treatment and control groups.
6. Re-estimate the treatment effect after matching on the estimated propensity score. Use nearest-neighbor matching (with replacement).
7. Finally, estimate the treatment effect using coarsened exact matching. Which matching method performs “better” here?

# Regression Discontinuity Design

Use the RDD checklist from Lee and Lemieux ([JEL 2010](#)) and the data `yelp.Rdata` to estimate the causal effect of an additional star (not half-star) on the yelp platform. Your data contain the following variables:

- `logrev` - monthly store revenue in (log) dollars.
- `stars` - the number of displayed stars on the Yelp site
- `score` - this is the true Yelp score that is rounded to produce *stars*
- `rest_id` - this is the restaurant identifier (1 to 1500)
- `time` - this is the time identifier (1 to 10)