

Supplementary Appendix for:  
Handling Limited Overlap in Observational Studies with  
Cardinality Matching

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# 1 Appendix A: A falsification test

As an additional robustness check, we conduct a falsification test for an effect that we know to be absent. For example, we know the 2010 earthquake should have no effect on elections before 2010. Furthermore, we exploit the fact that the same center-left candidate (Michelle Bachelet) ran for president in 2005 (pre-earthquake) and 2013 (post-earthquake). This creates an opportunity for a more credible before/after comparison because we can isolate for the candidate’s personal characteristics.

We conduct the falsification test in two stages. In stage 1, we test the effect of the earthquake on the vote share of the (challenger) center-left candidate in 2013. We use the same matched sample as before, but now rematching the units with the vote share of the center-left wing candidates in previous elections. Because we already know that the incumbent improved her vote share, we would expect the earthquake to have weakened the challenger’s electoral performance.

In stage 2, we use the 59 matched treated counties obtained in the matched sample to conduct a falsification test for the 2005 election. The falsification control group is optimally defined by selecting the counties that meet the balance constraints for the pre-2005 covariates. The same 59 counties are used in the matched treated group for the 2013 and 2005 elections to produce more credible comparisons, but the control group counties can be different since they are selected to achieve balance. Because we know that there was no 2005 earthquake, we would expect to see no differences between the matched exposed and control groups.

As expected, the results from stage 1 show that the earthquake decreases the vote share of the (challenger) center-left candidate in the 2013 election, and stage 2 shows that there are no differences between the matched exposed and control groups in the 2005 election. This falsification analysis gives us more confidence about the electoral effect of the 2010 earthquake in Chile: if there were hidden biases we would have observed a difference between both groups

of counties before the catastrophe.

Table 1: Wilcoxon signed-rank test: Center-left candidate vote share in 2005 and 2013.

	2005 Election	2013 Election
Hodges-Lehman point estimate	-0.014	-0.031
95% confidence interval	[-0.042, 0.012]	[-0.049, -0.012]
$p$ -value	0.294	0.002

## 2 Appendix B: Map

The following map shows the peak ground acceleration at the county level. A darker blue represents a higher intensity.

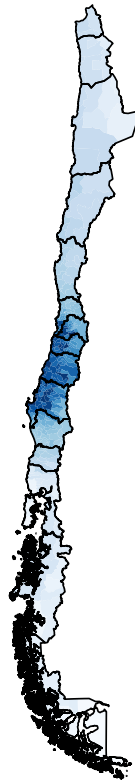


Figure 1: Peak ground acceleration at the county level.

### 3 Appendix C: Missing data

There are a few counties that do not have data for some covariates because they are too small, or they were divided or created after 2004. All these counties are excluded from the matching and posterior analysis of outcomes. These are: Antartica, Laguna Blanca, Tortel, Guaitecas, Lago Verde, Timaukel, Torres del Paine, Río Verde, O'Higgins, Chaitén, Juan Fernandez, Isla de Pascua, Alto Hospicio, Hualpén, Alto Bío Bío, Cholchol, Iquique, Talcahuano, Santa Bárbara, and Nueva Imperial.