Supplementary Appendix
After the Flood: Natural Disasters and Political Preferences

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1 Appendix A: Pre-analysis Plan

I pre-registered a preliminary theory and design before any research activity. In the pre-analysis plan I described the characteristics of the conjoint experiment, in particular, the candidates' attributes that would be randomized. The following is an excerpt from the preregistration: "*The experiment will ask a population of citizens living in the city of Copiapo to decide between two (non-real) candidates that will be competing for the position of mayor in the 2016 local elections. The respondents will see information about six attributes of these two candidates: ideology, gender, previous political experience, profession, age and proposal for affected citizens (proxy of distribution). These attributes will be randomly chosen to generate the candidates profiles. This experimental design allows for the comparison of the explanatory power of different treatments (Hainmueller and Hopkins 2014). (...) The outcome will be the answer to the following question: if you have to vote for one of these two candidates, whom do you prefer for mayor? Each of the respondents will have to evaluate 8 pairs of profiles. Therefore, in the analysis it will be necessary to cluster the standard errors by respondent.*"

The preliminary design intended to use flood damage as a covariate instead of a treatment. The pre-analysis plan said: the "*empirical design will allow me to study the interactions between candidates attributes and respondents' characteristics. In particular I will focus on how the damage produced by the floods at the individual level (pretreatment covariate) affects the way people make electoral decisions.*" I learned about the natural experiment in the field. After having this new information, I decided to interpret the results as the treatment effect of flood damage.

In the pre-analysis plan I registered the following preliminary theoretical framework: "*What explains voters' political preferences? There are multiple factors that affect voters' electoral behavior, but these can be aggregated in two main categories (Adams et al. 2005, Calvo and Murillo 2015). The first relies on the role of ideology, and assumes that voters and parties locate themselves along an ideal point on some ideological continuum. Voters prefer the candidate/party that minimizes ideological distance. The second category emphasizes the existence of non-ideological*

considerations in voters' decision making. This may involve voters taking into account some non-policy-related factors when they are deciding to vote for a particular candidate, such as descriptive representation (e.g. race, gender or social class), targeted distribution (e.g. vote-buying or patronage) and retrospective voting (reward/punish the incumbent when economic condition improve/worsen), among other non-programmatic variables. Adams et al. (2015) attempt to reconcile both groups of arguments by proposing a unified model of voting behavior, which integrates the behavioralist's perspective into the spatial-modeling framework. Therefore, the combination of the programmatic and non-programmatic components will explain voters' electoral decisions. However, all the theories that unified the spatial and sociological explanations assume that voters have fixed preferences regardless of the social and economic context. Ideology will have the same importance for voter i when she votes during adverse conditions (e.g. natural disaster or an economic crisis) and normal times. This project challenges this view, arguing that the importance of the ideological and non-ideological determinants of the vote are conditional to the context. Simply put, adverse conditions produced by natural disasters will affect the role of the ideological and non-ideological factors that explain voters' political preferences."

From this framework, I presented three hypotheses: (1) Political preferences are conditional on the magnitude of the negative shock. (2) Ideology (i.e. ideological congruence) will be less relevant to voters' preferences where the damage from the disaster was higher. (3) Future distribution of financial relief will be more important for explaining voters' preferences where the damage from the disaster was higher.

The first hypothesis was confirmed: affected citizens have different political preferences than unexposed citizens, in particular regarding their ideological preferences. The second hypothesis was also confirmed, because ideological congruence is less relevant for exposed citizens. Ideological congruence is the difference between a voter's self-placement in the ideological spectrum and the ideology of her or his preferred candidate. The results show that respondents did not change their ideological placement, but affected citizens are more likely to vote for left-wing politicians. Consequently, ideological congruence becomes less relevant for them. The third hypothesis was

not confirmed because of the spillover effects discussed in the paper. This latter discussion was incorporated in the paper after I learned about the empathic feelings in the field.

The previous theoretical framework mainly focused on the role of ideological congruence. Natural disasters do, in fact, reduce the ideological congruence between voters and parties, because the former are willing to vote for new candidates. However, this is a consequence of victims' focus on welfare. Therefore, the new theoretical framework (i.e., disaster victims are more likely to select political authorities who can increase their welfare after the catastrophe) is taking a step backwards to better understand voters' political preferences after natural disasters. The lack of ideological congruence is now an implication of the main theory.

In summary, I made two main amendments to the pre-analysis plan. First, I re-conceptualized flood damage as a treatment instead of a covariate. The analysis remains the same (interaction between flood damage and the conjoint experiment). Second, the preliminary theory focuses on ideological congruence, but now I develop a more general theory about how citizens modify their political preferences after natural disasters.

2 Appendix B: The Ravine and the Bridge

Figure 1: Paipote's Ravine

Figure 2: Paipote's Bridge

3 Appendix C: Exposed and Unexposed Areas

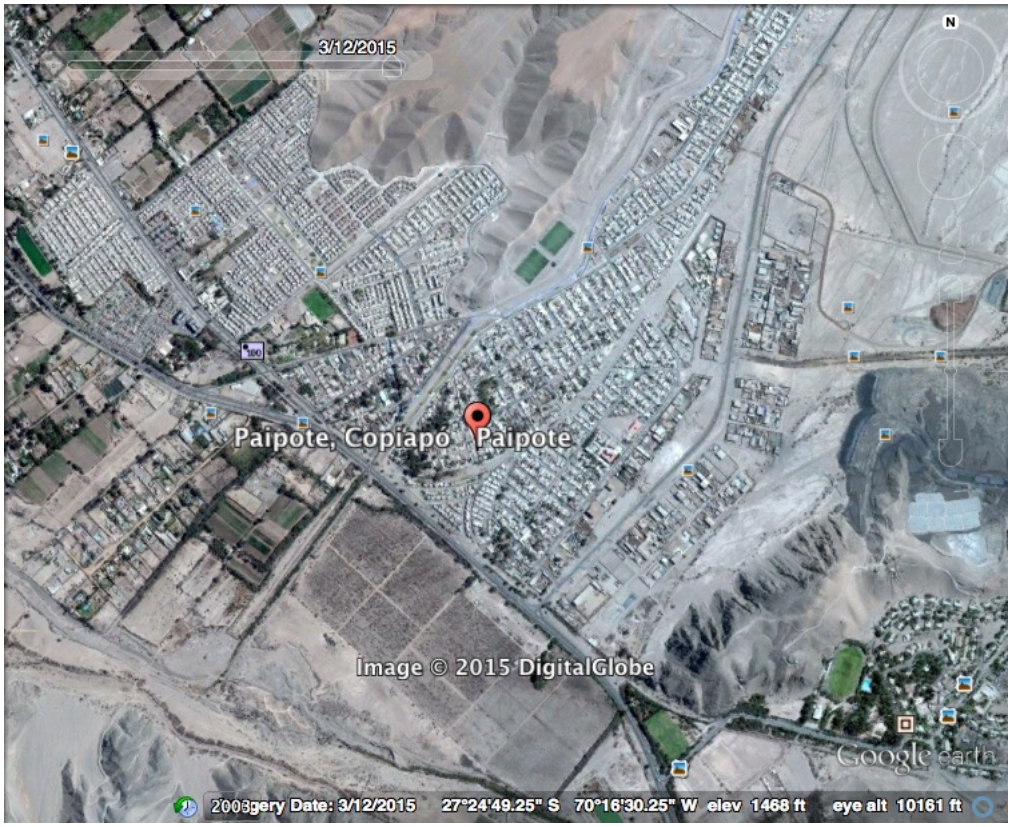


Figure 3: Google Earth; before the floods

Figure 4: Google Earth; after the floods

4 Appendix D: Differential Effects

The comparison between the more and the less affected areas of Paipote is similar to the concept of differential effects developed by Rosenbaum (2006). Differential effects are immune by design to generic unobserved biases, since they should affect different treatment conditions in similar ways. Consequently, it is possible to remove the generic unmeasured biases by studying associated or parallel treatments. For example, if we want to compare the effects of crack cocaine use during pregnancy, a comparison between treated and control subjects is likely to be biased since a woman who uses crack might engage in other unmeasured activities that can also put the fetus at risk. However, it is possible to expect a similar pattern of behavior by a woman who uses marijuana during pregnancy (Rosenbaum, 2006). Therefore, the comparison of two treatment conditions, crack cocaine and marijuana, and the exclusion of a pure control group, will allow us to rule out the generic unobserved biases common in both treatments. In the case of Paipote, there are two treatment conditions: being directly and being indirectly affected by the flood. Hence, a pure control group constructed with people from a different city that were not affected (directly or indirectly) by the flood might not be as good a comparison as the unexposed citizens from Paipote.

In summary, this research design exploits two features to decrease sensitivity to hidden biases: the low heterogeneity in Paipote, since both groups are coming from the same natural block, as well as the differential effects generated by the comparison of two associated treatment conditions.

5 Appendix E: Survey Implementation

The survey was implemented in Copiapó during June 2015, three months after the disaster. The affected and unaffected areas were defined through conversations with the local police, firefighters, and citizens. It was confirmed by official government images, a map marked by the local fire department after the flood, and satellite images. Half of the questionnaires were implemented in the exposed areas, and the other half in the unexposed areas.

Regarding the conjoint experiment, the candidates profiles were generated in advance to the implementation using *R*. Each questionnaire had eight pair of candidates attached at the end. The survey and conjoint were implemented in paper.

The sampling strategy was exactly the same across the more and less affected areas. This is a key part of the design, because the differences between both sectors cannot be explained by differences in the implementation of the survey. The streets were selected following a random walk. On a given street, all households were invited to participate in the survey. By the end of the survey, almost all the town was accounted for. Only one sector was not included in the design, since it was partially affected and it is a relatively new area, so it could bring unwanted heterogeneity.

6 Appendix F: Regression Results

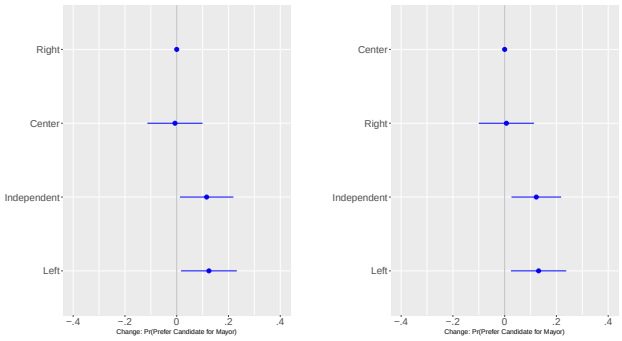
Table 1: Regression Results

	Outcome
	Electoral Choice
Center	0.018
	(0.037)
Independent	0.005
	(0.033)
Left	−0.060
	(0.037)
Teacher	0.060
	(0.034)
Engineer	0.009
	(0.036)
Female	0.029
	(0.023)
40	−0.002
	(0.034)
50	−0.034
	(0.033)
Council member	0.006
	(0.032)
Mayor	0.046
	(0.036)
Will distribute a financial relief	0.260***
	(0.033)
Treatment	−0.047
	(0.066)
Treatment*Center	−0.007
	(0.054)
Treatment*Independent	0.116*
	(0.053)
Treatment*Left	0.124*
	(0.055)
Treatment*Teacher	−0.032
	(0.048)
Treatment*Engineer	−0.036
	(0.050)
Treatment*Female	−0.029
	(0.032)
Treatment*40	0.013
	(0.046)
Treatment*50	0.028
	(0.045)
Treatment*Council member	0.060
	(0.044)
Treatment*Mayor	0.004
	(0.047)
Treatment*Will distribute a financial relief	−0.002
	(0.046)
Constant	0.292***
	(0.047)

Note: *p<0.05; **p<0.01; ***p<0.001

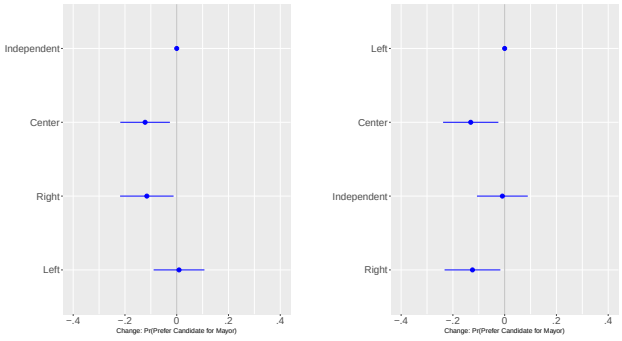
7 Appendix G: Other Reference Categories

The main results were based on using a right-wing candidate as the reference category, but it is also possible to observe voters' preferences using the different ideological positions of the candidates as the baseline categories. The following figures report the results for the interactions (δ coefficients) but now also using independent, center, and left as reference categories. Only the results for the ideological attributes are reported.



(a) Right-wing candidate as baseline category

(b) Centrist candidate as baseline category



(c) Independent candidate as baseline category

(d) Left-wing candidate as baseline category

Figure 5: Effects of the Flood Using Different Reference Categories for Ideology

8 Appendix H: Robustness Checks

I have conducted two different robustness checks to test the sensitivity of my results to using a different treatment and sample.

When using the original treatment, 1 refers to reporting material damage, and 0 otherwise. In this robustness check, I redefine the treatment to make 1 equal to living in the area affected by the flood and 0 to living in an unexposed area.

The second robustness check tests the original specification in a matched sample. I used the `designmatch` package (Zubizarreta and Kilcioglu, 2016) to select the largest matched sample that reduces the standardized differences of the placebo covariates to be lower than 0.05. The new matched sample has 188 subjects; therefore, the matching procedure pruned 12 respondents to achieve the balance constraints defined beforehand.

The next table reports the results of the two robustness checks. The first model uses the original sample but an alternative treatment (area), while the second model uses the original treatment but an alternative sample (matched sample). I only report the δ coefficients (interactions) for left-wing candidates (in comparison to right-wing ones). The findings are consistent with the previous results: affected voters are rewarding candidates with a left-wing label.

Table 2: Robustness checks

	Outcome:	
	Electoral Choice	
	Area as Treatment	Matched Sample
	(1)	(2)
Left*Area	0.119*	
	(0.055)	
Left*Treatment		0.130*
		(0.057)
Respondents	200	188
Observations	3200	3008
Note:	*p<0.05; **p<0.01; ***p<0.001	

9 Appendix I: Retrospective Evaluations

Are retrospective evaluations of authorities different across exposed and unexposed areas? Can those differences drive the main results? In the next table I show that the performance evaluations of the mayor and the president handling the disaster are statistically indistinguishable between both groups. Therefore, affected voters are not more likely to vote for a left-wing candidate because they have a worse or better opinion of the mayor or the president. The dependent variable has the following values to measures the performance of political authorities: (1) very good, (2) good, (3) neither good nor bad, (fair) (4) bad, (5) very bad.

Table 3: Regression results for authorities' evaluations

	Performance evaluation:	
	Mayor	President
	(1)	(2)
Treatment	−0.156	−0.101
	(0.140)	(0.143)
Controls	Yes	Yes
Observations	195	194
Note:	*p<0.05; **p<0.01; ***p<0.001	

10 Appendix J: Balance Test

Table 4: Balance test

	Outcome
	Respondent's gender
Center	−0.018
	(0.024)
Independent	0.018
	(0.022)
Left	−0.002
	(0.024)
Teacher	−0.012
	(0.021)
Engineer	−0.011
	(0.020)
Female	0.001
	(0.017)
40	−0.0005
	(0.018)
50	−0.006
	(0.015)
Council member	−0.015
	(0.019)
Mayor	−0.008
	(0.019)
Will distribute a financial relief	−0.015
	(0.017)
Constant	1.765***
	(0.039)

Note: *p<0.05; **p<0.01; ***p<0.001

11 Appendix K: Profile Order Effects

The table is only reporting the interaction terms.

Table 5: Profile order effects

	Outcome
	Electoral Choice
Center*Candidate 2	−0.030
	(0.051)
Independent*Candidate 2	−0.047
	(0.051)
Left*Candidate 2	−0.075
	(0.049)
Teacher*Candidate 2	0.057
	(0.044)
Engineer*Candidate 2	0.028
	(0.042)
Female*Candidate 2	−0.045
	(0.034)
40*Candidate 2	0.029
	(0.039)
50*Candidate 2	0.042
	(0.044)
Council member*Candidate 2	0.044
	(0.042)
Mayor*Candidate 2	0.065
	(0.039)
Will distribute a financial relief*Candidate 2	−0.004
	(0.036)
Note:	*p<0.05; **p<0.01; ***p<0.001

12 Appendix L: Carryover Effects

The table is only reporting the interaction terms for the main attribute of interest (ideology).

Table 6: Carryover effects

	Outcome
	Electoral Choice
Center*Pair 2	0.016
	(0.099)
Independent*Pair 2	−0.045
	(0.094)
Left*Pair 2	−0.036
	(0.094)
Center*Pair 3	0.077
	(0.097)
Independent*Pair 3	−0.122
	(0.090)
Left*Pair 3	0.054
	(0.098)
Center*Pair 4	0.126
	(0.098)
Independent*Pair 4	0.086
	(0.100)
Left*Pair 4	0.031
	(0.094)
Center*Pair 5	−0.061
	(0.100)
Independent*Pair 5	−0.063
	(0.087)
Left*Pair 5	−0.027
	(0.098)
Center*Pair 6	−0.004
	(0.097)
Independent*Pair 6	0.070
	(0.092)
Left*Pair 6	0.032
	(0.093)
Center*Pair 7	0.105
	(0.102)
Independent*Pair 7	0.082
	(0.094)
Left*Pair 7	0.152
	(0.100)
Center*Pair 8	−0.046
	(0.104)
Independent*Pair 8	0.041
	(0.093)
Left*Pair 8	−0.024
	(0.104)

Note: *p<0.05; **p<0.01; ***p<0.001

13 Appendix M: Details about Behavioral Benchmark

The covariates used to select the control units were the following: right-wing parties[1] vote share in the 2012 local elections (Renovación Nacional, and Unión Demócrata Independiente); centrist parties vote share in the 2012 local elections (Partido Regionalista de los Independientes, ChilePrimero, and Fuerza del Norte); left-wing parties vote share in the 2012 local elections (Partido Igualdad, Partido Ecologista Verde, Partido Ecologista Verde del Norte, Partido Progresista, Partido Comunista, Izquierda Cristiana, Partido por la Democracia, Partido Radical Socialdemócrata, Partido Demócrata Cristiano, Partido Socialista, Movimiento Amplio Social, and Partido Humanista); independent candidates vote share in the 2012 local elections; human development index computed by the PNUD in 2003; poverty levels generated by the Ministry of Social Development in 2009, and demographic characteristics obtained from the 2002 national census.[2]

The following are the outcome variables: right-wing parties vote share in the 2016 local election (Renovación Nacional, Evolución Política, Partido Regionalista Independiente, and Unión Demócrata Independiente); centrists parties vote share in the 2016 local elections[3] (Partido Regionalista de Magallanes, Amplitud, and Somos Aysén); left-wing parties vote share in the 2016 local election (Partido Ecologista Verde, Poder, Partido Demócrata Cristiano, Partido Socialista, Partido Radical Socialdemócrata, MAS Región, Izquierda Ciudadana, Partido por la Democracia, Partido Comunista, Revolución Democrática, Partido Igualdad, Frente Popular, Fuerza Regional Norte Verde, Partido Progresista, Democracia Regional Patagónica, Frente Regional y Popular, Wallmapuwen, Partido Liberal, Partido Humanista, Movimiento Independiente Regionalista Agrario y Social, and Unión Patriótica); independent candidates vote share in the 2016 local elections; age of candidates; and education of candidates.[4]

[1] Center-left wing parties are considered as left-wing, meanwhile center-right are considered as right-wing.

[2] The following are the exposed counties: Antofagasta, Taltal, Copiapó, Caldera, Tierra Amarilla, Chañaral, Diego de Almagro, Vallenar, Alto del Carmen, Freirina, and Huasco. Meanwhile, the following are the selected control counties that meet the covariate balance requirements: Calama, Quilpue, Maria Elena, Calera, Illapel, San Pedro de Atacama, Quintero, Panquehue, Combarbala, Algarrobo, and San Antonio.

[3] Some of the parties that were considered in the center of the ideological spectrum in 2012 now are right-wing parties because they joined the list of the center-right coalition.

[4] Binary indicator of more than high school constructed using the public declaration of patrimony.

The goal of the mathematical algorithm used in the paper was to generate the largest matched sample that is balanced in terms of observed covariates. The balance requirements can be defined beforehand by the researchers. In this case, I focus on mean balance. This means that standardized differences between both groups should be below a particular threshold. I use the `designmatch` package in `R` (Zubizarreta and Kilcioglu, 2016) and the `Gurobi` optimizer to obtain the control group.

14 Appendix N: Interviews in Spanish

Carmen: "Cuando ocurrío el aluvión yo estaba acá en mi casa, y a las 4 de la mañana llegan los bomberos con la sirena informando que teníamos que evacuar toda esta calle, porque se podría ver toda esta parte inundada. Y de ahí nosotros evacuamos hacia cerca de la plaza, un poco más allá, y como a las 6 de la mañana ya empezó a llover más fuerte. Y después como a las 12, ya en la casa de mis abuelos, se vino toda el agua encima, ya no pudimos arrancar ni nada. **Investigador**: Donde queda la casa de sus abuelos, por que parte? **Carmen**: Por 21 de mayo con Juan López, por la avenida principal. **Investigador**: Y esa parte fue afectada, por las ...? **Carmen**: Si, toda esa parte fue afectada. Nosotros evacuamos mejor allá para tener más resguardo, porque yo tengo un bebe. **Investigador**: Usted esperaba que esta parte iba ser más afectada que allá abajo, pero fue al revés al final? **Carmen**: Claro, porque aca no paso nada. Como a las 12 del día se empezo a salir toda el agua de la defensa, y ya no teníamos nada que hacer. Tuvimos que empezar a subir algunas cosas de nuestros abuelos, salvarles ropa, y la comida, porque sabíamos que se venían varios días sin luz sin agua. Y tuvimos que arrancar por el patio, alcanzamos a rescatar un escalera y un primo la puso y tuvimos que salir arrancarnos todos por los patios. Ahí nos resguardamos en una casa de una vecina de mis abuelos, pero igual el agua hasta por aca, mi bebe quedo flotando en la cama. Entonces fue como super angustiante. Y en un momento yo igual pense que me iba a morir, era tanta la fuerza del agua, y con tanta rapidez que llego y entro que nosotros no sabiamos que hacer. Y habíamos muchos más ahí porque todos nos fuimos para allá. **Investigador**: Usted vive acá, esta es su casa? Y aqui que fue lo que sucedió? **Carmen**: Aca la lluvia no más, igual vino un poco de barro, porque más arriba igual se salio un poco de la defensa y todo. Pero justo esta parte como que no fue mucho, solamente barro pero que no alcanzo a entrar a las casas."

Daniela: "Todos los proyectos que uno tenía tuvieron que cambiar, tuvieron que retroceder. Muchos se cortaron y cambiarlos por otros. El arreglo de la casa, porque ayuda no hemos tenido. (...) La prioridad en este momento es la casa, lo otro paso a segundo plano."

Rosa: "Luego de las inundaciones cambia todo. (...) Yo tenía aspiraciones, tenía sueños, y eso quedo ahí (...) Para mi ha sido complicado, mi hijo tuvo que dejar la Universidad, para mi ha sido fuerte también. (...) No pense que después del 25 de marzo me iba a cambiar tanto la vida. No pense. Tampoco creía que me podía suceder una cosa así. Despues del 25 de marzo yo pense que era un sueño. El 26 de marzo yo veía mi casa llena de barro, y decía chuta, va a llegar la noche y donde voy a dormir. Mañana voy a despertar y estoy no va a estar, porque esto es un sueño."

Manuel: "Yo creo que cuando uno elige a alguien no es por esas situaciones, o cosas puntuales o especificas (beneficios), así yo le voy a dar esto. No po, tiene que ser un compromiso más general con la comunidad (...) El bono tanto para este, son dos lucas, tres lucas, y a quien le sirve eso, en el tiempo a nadie. Tiene que ser algo concreto, porque yo le puedo decir le voy a dar este beneficio pero la gente va seguir en lo mismo. No son soluciones definitivas, son de momento".

Claudia: "A mi me gustaría que el alcalde que saliera o fuese electo se preocupara de la calidad de vida de las personas (...). Pero si, que se preocupe de la calidad de vida en todo aspecto, en todo aspecto, no que me entreguen una bolsa con comida, no, otras cosas, también."

Ana: "Y después escuchar los testimonios de la gente, escuchar que pudieron salvar sus vidas, amarrarse a las rejas para que el agua no los llevara (...) niñitos que perdieron todo."

Tania: "Yo una vez me acuerdo que me vine en la micro y habia una pareja de abuelitos que habian ido a comprar, y la micro los dejo y yo me ofrecí a encaminarlos, y la abuelita me dijo sabe que hija perdimos todo, la casa, me dijo la casa era mia dijo, y yo tenía de allegada a mi hija, a mi hija le dieron y a nosotros no (...) Como veis tu, si se supone que la casa era de la abuelita, y eran dos familias, deberian darles a los dos por iguales y le dieron a una."

15 Appendix O: Details about External Validity

In this analysis I use the CEP survey conducted in June and July 2010, three months after the earthquake. This analysis is based on the strategy implemented by Zubizarreta, Cerdá and Rosenbaum (2013) to study how this earthquake affected victims' levels of post-traumatic disorder.[5] The matching procedure is the same implemented for the construction of the behavioral benchmark. The algorithm finds the largest matched sample that is balanced by design (Zubizarreta, Paredes and Rosenbaum, 2014). The outcomes are questions that were included in the survey because of the earthquake but asked to the entire sample. The CEP study is a national representative survey, and the most prestigious in Chile.[6]

[5] In particular it mimics the decisions to define an exposed county based on the peak ground acceleration.

[6] The affected counties selected by the algorithm are: Arauco, Buin, Bulnes, Cabrero, Casablanca, Cauquenes, Chanco, Chiguayante, Chillan, Chillan Viejo, Concepcion, Constitucion, Coronel, Curanilahue, El Quisco, Graneros, Las Cabras, Linares, Litueche, Los Angeles, Lota, Maria Pinto, Melipilla, Ninhue, Penco, Renaico, Retiro, San Carlos, San Javier, San Pedro de la Paz, San Vicente, Santa Cruz, Talca, and Talcahuano. The control counties selected by the algorithm are: Antofagasta, Arica, Calama, Calbuco, Castro, Copiapo, Coquimbo, Coyhaique, Curaco de Velez, Illapel, Iquique, La Serena, Lago Ranco, Maullin, Natales, Osorno, Ovalle, Paillaco, Panguipulli, Puerto Montt, Punta Arenas, Quemchi, Rio Negro, San Pablo, Tocopilla, Valdivia, and Vallenar.

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