Supplementary Appendix: Does Immigration Increase Nationalism? The Effect of a Sudden Demographic Change on Political Attitudes and Electoral Behavior

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1 Appendix A: Immigration Data

In this section, we answer three relevant questions regarding our data and immigration in Chile. First, did migrants have incentives to regularize their immigration status? Before 2018, migrants in Chile had compelling reasons to regularize their status. For instance, they could access social benefits and public services and avoid the risk of deportation. Those who stayed in the country after their 90-day permit expired faced penalties ranging from 0.22 to 4.46 times the minimum wage and the looming threat of deportation. Consequently, waiting more than 90 days was costly for migrants, but regularizing their stay entailed a straightforward bureaucratic process.

Second, is the immigration process the same across different regions of the country? Although we have data at the municipality level (i.e., where the migrant lived at the time of their application), visa applications are filed at the national level. The immigration office is a centralized agency within the Ministry of Interior; it receives applications from all regions of the country. The application processing times are, therefore, likely to be consistent across geographic locations.

Third, did migrants move to a different municipality after obtaining a visa? Data from the 2017 Census provides some insight into this question. It inquired whether individuals were living in the same municipality as they were five years ago. Those who had not relocated were classified as "non-migrants for internal migration purposes;" 75% of foreign-born individuals fell into this category. A significant majority of the foreign-born population, therefore, tended to remain in the same municipality for an extended period of time. Such decisions to stay could be attributed to various factors, including the development of safety nets and personal networks within these communities (Severino and Visconti, 2023).

2 Appendix B: Panel Data

The Longitudinal Social Study of Chile is a survey developed by the Center for Conflict and Social Cohesion Studies to analyze the evolution of conflict and cohesion in Chilean society. The questionnaire contains both closed and open questions. Its target population is men and women aged 18–75, mainly in urban areas. It uses a probabilistic, stratified cluster and a multistage sampling design. It has been implemented once a year since 2016. The first wave was representative of approximately 77% of the country's total population and 93% of the urban population.

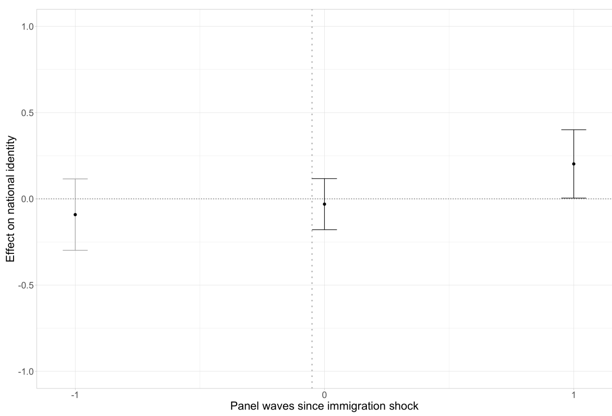
Table A1 provides the descriptive statistics for three key covariates: age, gender, and education. We evaluate the representativeness of our sample against a population benchmark: the nationally representative CEP survey implemented in July 2023. Our sample closely resembles this nationally representative survey with respect to these covariates.

Table A1: Descriptive statistics

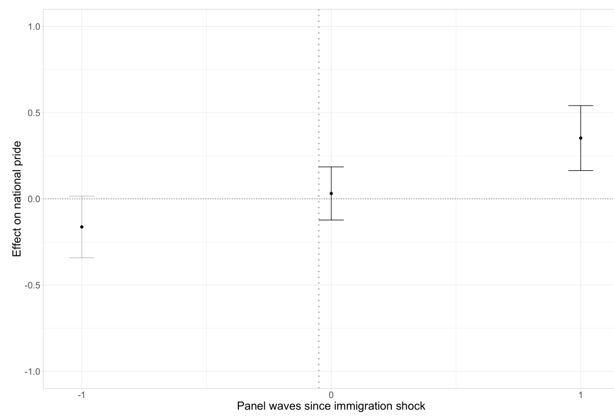
Covariate	Sample	CEP
High school or less	0.67	0.63
Woman	0.62	0.66
Age	48	49

3 Appendix C: Pride and Identity

In the manuscript, we use the average of national pride and national identity as the main outcome to facilitate the interpretation of the main findings. In this section, we report the results for pride and identity separately.



(a) Identify with Chile



(b) Proud of Chile

Figure A1: Average effect of immigration shocks on nationalistic attitudes by length of exposure. A length of exposure of -1 refers to the period before the first exposure, 0 to the first exposure, and 1 to the second exposure to an immigration shock. 6,034 observations (respondent-wave).

The result for neither outcome is significant before the first exposure (proud: 95% CI: [-0.371, 0.023], identify: 95% CI: [-0.286, 0.089]), which provides evidence in support of the parallel-trends assumption (i.e., both groups follow the same trajectory in the pre-treatment period, which is indicated by the null results). Nor is there evidence of an effect during the first exposure (proud: 95% CI: [-0.103, 0.169], identify: 95% CI: [-0.170, 0.102]). However, there is a clear effect one year from the first exposure. A second exposure to an immigration shock increases national pride by 0.34 standard deviation points (95% CI: [0.153, 0.537]) and national identity by 0.20 standard deviation points (95% CI: [0.010, 0.383]).

We also provide the results when using a generalized difference-in-differences (DiD) design and a continuous treatment for identity and pride separately.

Table A2: Generalized DiD using a continuous exposure indicator and identify with Chile as the outcome

	I identify with Chile			
	(1)	(2)	(3)	(4)
Demographic change	0.034*	0.033*	0.033*	0.032*
	(0.014)	(0.014)	(0.014)	(0.014)
Controls	No	Yes	No	Yes
Wave fixed effects	Yes	Yes	Yes	Yes
Respondent fixed effects	Yes	Yes	No	No
Municipality fixed effects	No	No	Yes	Yes
Observations	6,229	6,226	6,229	6,226
Note:				$^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

Table A3: Generalized DiD using a continuous exposure indicator and proud to be Chilean as the outcome

	I feel proud to be Chilean			
	(1)	(2)	(3)	(4)
Demographic change	0.041**	0.041**	0.041**	0.041**
	(0.014)	(0.014)	(0.014)	(0.014)
Controls	No	Yes	No	Yes
Wave fixed effects	Yes	Yes	Yes	Yes
Respondent fixed effects	Yes	Yes	No	No
Municipality fixed effects	No	No	Yes	Yes
Observations	6,214	6,211	6,214	6,211
Note:				$^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

The results indicate that a one-standard-deviation increase in demographic changes due to migration boosts national identity by 0.03 and national pride by 0.04 standard deviation units. These effect sizes cannot be compared with the dynamic DiD because of the different structures of their exposure indicators.

4 Appendix D: No controls

In this section, we provide the main results without controls, and the main conclusions hold. There is evidence to support the parallel-trends assumption (i.e., null findings for the pre-treatment periods), no evidence of an immediate effect, and a significant effect one year after exposure.

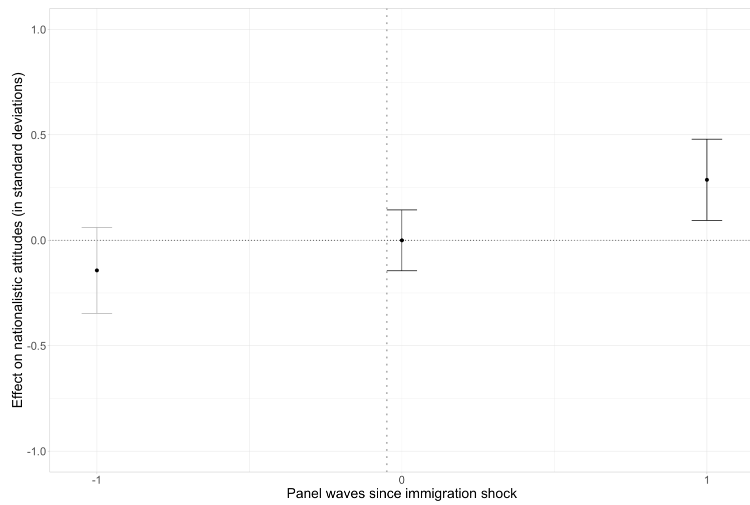


Figure A2: Average effect of immigration shocks on nationalistic attitudes by length of exposure. A length of exposure of -1 refers to the period before the first exposure, 0 to the first exposure, and 1 to the second exposure to an immigration shock. 6,034 observations (respondent-wave).

5 Appendix E: Hate Crimes

In this section, we evaluate whether reports of crimes involving hostility toward migrants increased due to large demographic changes. Ideally, we would use hate crimes against migrants as the outcome, but this data is not available. We, therefore, use municipality-level data on affrays, assaults, damages, and disorderly conduct in 2016, 2017, and 2018 to construct a proxy of hostility toward migrants.[1] Previous studies and media reports have shown that hate crimes and hostility toward migrants usually involve such infractions (Arellano Calderón, 2022). Figure A3 uses a dynamic DiD to study how demographic changes influence this type of crime. The design is the same as the main analysis used in Section A4, but now we use municipalities-waves as the level of analysis rather than panel survey respondents.[2]

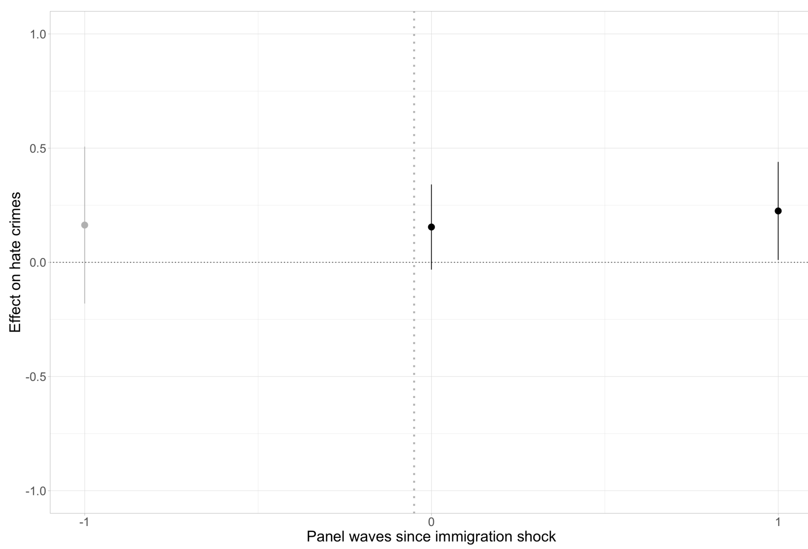


Figure A3: Average effect of immigration shocks on nationalistic attitudes by length of exposure. A length of exposure of -1 refers to the period before the first exposure, 0 to the first exposure, and 1 to second exposure to an immigration shock. 276 observations (municipality-wave).

[1] We use the same years as the panel survey to keep the same structure for the dynamic DiD.

[2] We use the same municipalities included in the panel study to ensure the results for attitudes and behaviors are comparable.

The findings are congruent with the previous results: there is support for the parallel-trends assumption when checking pre-exposure trends (95% CI: -0.197, 0.523), there is no immediate effect of immigration shocks (95% CI: -0.055, 0.364), and there is a significant change after one year of exposure. Crimes associated with hostility toward migrants increased by 0.230 standard deviation points (95% CI: 0.008, 0.442).

A natural concern is that these crimes and offenses may increase *not* as the result of discrimination but because migrants are committing those crimes themselves. To rule out this possibility, we implement a falsification test. We identify the impact of immigration shocks on crimes unrelated to violence against migrants, such as incivility crimes (i.e., public intoxication and disturbance of the peace), property crimes (i.e., burglaries, robbery, theft, robbery by surprise, failed robbery, and handling of stolen goods), violent crimes (i.e., homicides, sexual abuse, domestic violence against women, men, children, and the elderly), and weapon-related crimes (i.e., illegal carrying of weapons and illegal possession of weapons). If immigration shocks do not increase these 16 types of crimes, we will have strong evidence that the increase in crimes associated with hostility toward migrants cannot be attributed to migrants committing them.

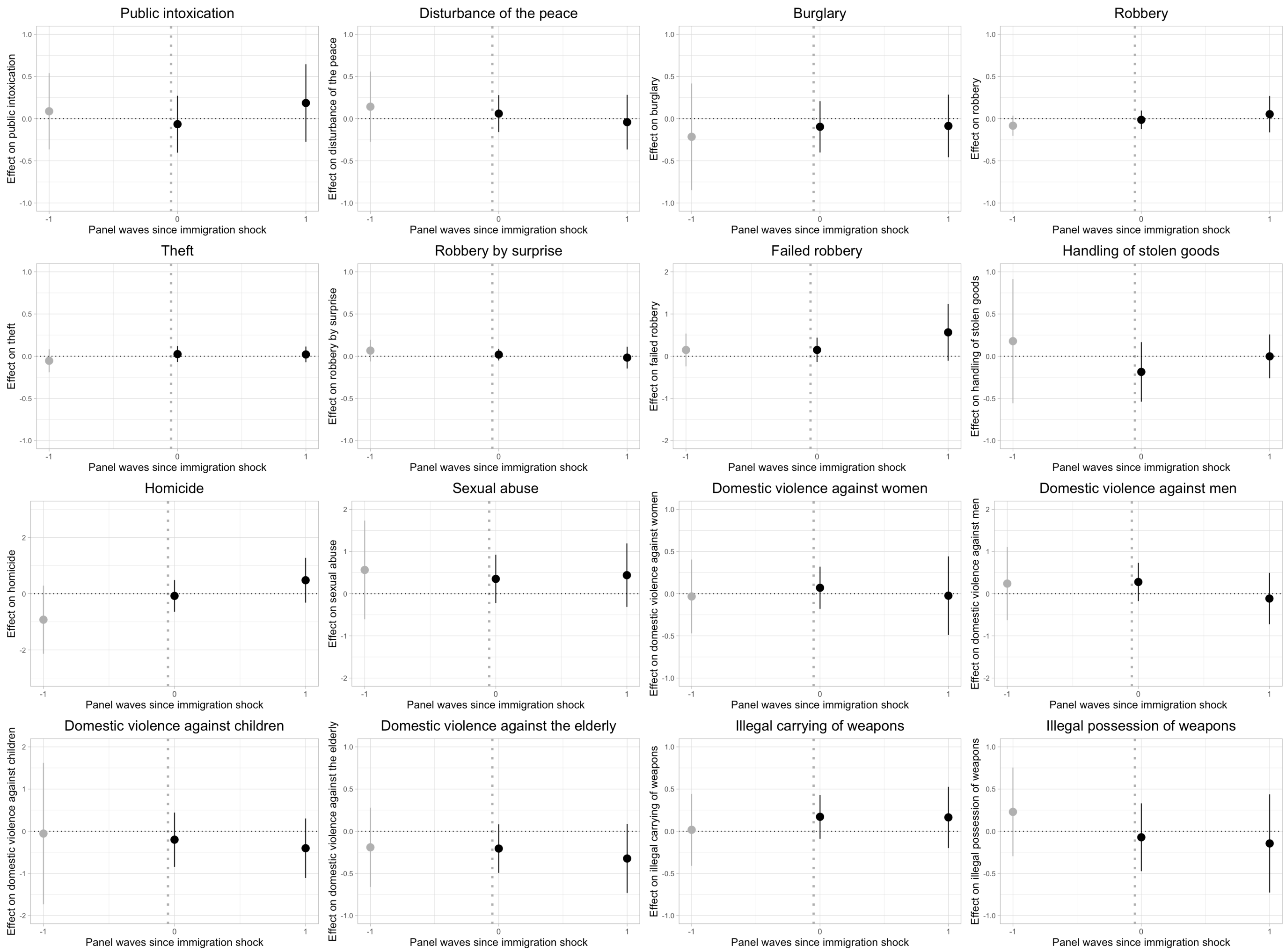


Figure A4: Average effect of immigration shocks on nationalistic attitudes by length of exposure. A length of exposure of -1 refers to the period before the first exposure, 0 to the first exposure, and 1 to the second exposure to an immigration shock. 276 observations.

All the subgraphs within Figure A4 provide support for the parallel-trends assumption. Also, there is no evidence of an effect of immigration shocks on crimes not associated with hostility toward migrants after the first or second exposure.

6 Appendix F: Sentiment Analysis

This analysis is structured into three phases: data collection, text pre-processing, and analysis. In the first phase, we scraped Twitter data from October 2016, October 2017, and October 2018 (the three waves of the panel survey used to capture the outcomes were implemented in these months). We collected 8,604 tweets containing the following keywords: "Chile & Inmigrantes," "Chile & Extranjeros," "Chile & Haitianos," and "Chile & Venezolanos." The dataset contains the self-reported location of the tweeting account, which was used to identify tweets originating from Chile.

To analyze the sentiment of tweets in Chile from 2016 to 2018, we used a natural language processing tool to categorize the negative words contained in the tweets. Sentiment analysis usually uses lexicons or dictionaries that assign numerical sentiment scores to words or phrases. Scores of the individual words in the tweets are aggregated to the annual level, and the result is a sentiment score for the tweets for that year. For this analysis, we use three types of sentiment lexicons: Bing, Afinn, and the NRC Word-Emotion Association Lexicon.

In the second phase, text pre-processing, we used the translate function in Excel to translate all of the tweets into English. Then, we generated a text corpus grouped by year (2016, 2017, and 2018). In this step, we segmented the character strings into individual words, often referred to as unigrams or tokens. During this segmentation process, some sentences were reduced to numbers or special characters or were left empty. To ensure the precision of the lexicon-based sentiment analysis, we cleaned the text by removing URLs, @mentions, dividers, punctuation, numbers, and stop words.

In the third phase, we analyzed 2,954 tweets; 30,264 words were subjected to the analysis after pre-processing, and the results are the following:

BING lexicon: The count of negative words increased over time: 178 in 2016, 488 in 2017, and a significant 991 in 2018. This data constitutes evidence of an increase in negative sentiments.

NRC lexicon: We also observed an increase in the count of negative words each year using the NRC sentiment dictionary. In 2016, there were 384 negative words, which increased to 855 in 2017, and 1,271 in 2018.

AFFIN lexicon: The AFFIN Lexicon scores sentiment on a continuous scale: more extreme words receive higher values. This scoring system assigns valences on an integer scale ranging from -5 (negative) to +5 (positive). Using this lexicon, we computed sentiment scores by summing the values assigned to words in tweets for each year. The results indicate a consistent negative sentiment trend over the years. In 2016, the sentiment score was -113 (predominantly negative). The negativity intensified in 2017 to -221. The sharpest decline in sentiment was observed in 2018 (-966). These findings exhibit a clear trend toward negativity in the sentiments expressed in the tweets over the 3-year study period.

These negative sentiments correlate with the increase in the number of migrants. In 2016, visa requests increased by seven percentage points; in 2017, they increased by 24 percentage points, and in 2018 by 41 percentage points. There is thus an association between higher levels of immigration and more negative tweets about migration coming from Chile. Figure A5 summarizes the negative sentiments using the different scoring systems (AFFIN in absolute values) and the demographic changes from 2016 and 2018, illustrating the correlation between them.

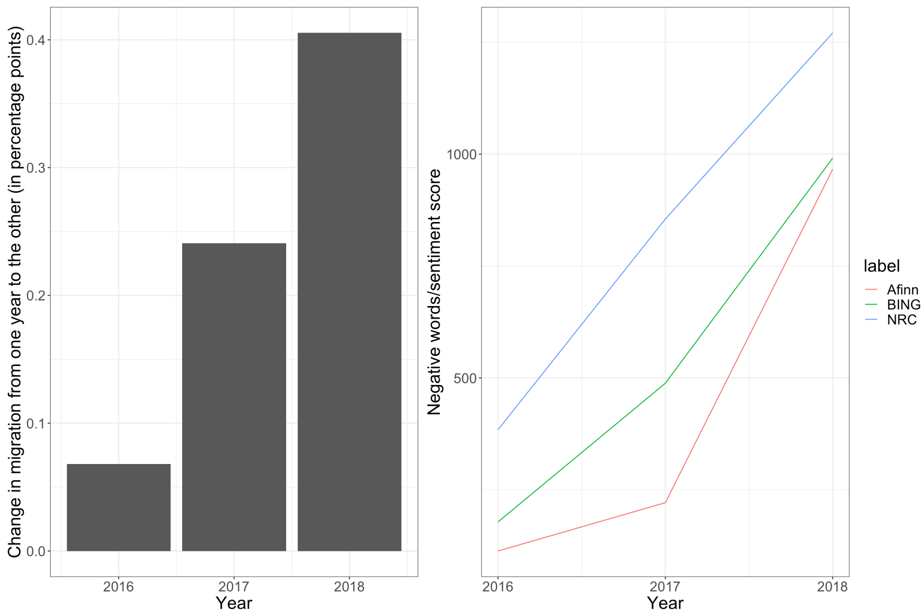


Figure A5: Left: Demographic changes in percentage points from one year to the next (2016-2018). Right: Negative words/sentiments on tweets about migration georeferenced in Chile using different lexicons (2016-2018).

7 Appendix G: External Validity

Do these results apply beyond Chile? To increase the study's external validity, we test part of our argument using survey data from eight South American countries. We use the World Values survey since it includes a proxy for nationalistic attitudes – "Willingness to fight for one's country," a binary variable associated with nationalistic sentiments and national identity in the literature (Shulman and Bloom, 2014; Torres, 2020; Kim, 2020). Since this question differs from the one used in the main analysis, this result should be interpreted with caution.

A limitation of a cross-case study is that we do not have access to high-quality administrative data to measure demographic changes, as we do for Chile. Therefore, we evaluate respondents' nationalistic attitudes before and after Venezuela's socioeconomic and political collapse in 2015–2016. This crisis generated the largest wave of regional migration in Latin American history: millions of Venezuelans left their country looking for safer and more prosperous places, and most of them migrated to countries in South America (Vega-Mendez and Visconti, 2021). We use all South American countries with survey data availability: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, and Uruguay.

We use two waves before Venezuela's collapse (2013 and 2014) and two waves after (2017 and 2018) to estimate the impact of this demographic change. Since this is not panel data and we do not have exposed and control subjects, we cannot implement a dynamic DiD design as in the main analysis. Therefore, we estimate the effects of the crisis, measured with a binary indicator representing the years after the Venezuelan collapse (surveys implemented in 2017 and 2018), by using a linear regression with six different specifications using: i) controls,[3] ii) country fixed effects with controls, iii) year fixed effects, iv) year fixed effects with controls, v) country and year fixed effects, and vi) country and year fixed effects with controls.

Figure A6 displays the impact of the 2015–2016 Venezuelan collapse on willingness to fight for one's country. We find a positive and significant impact for all our estimations. For example,

[3] Subjects' characteristics that should be affected by exposure to migration, such as education, gender, and age.

when using country-fixed effects and controls (i.e., the smallest effect we found), willingness to fight increased by four percentage points after 2015 (95% CI: [0.02, 007]).

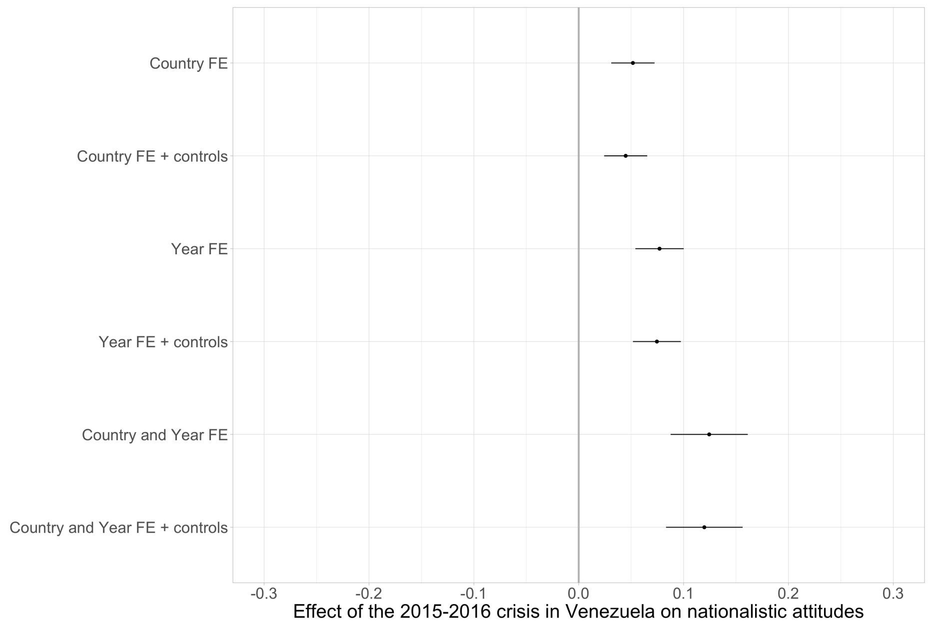


Figure A6: Effect of 2015-2016 Venezuelan crisis on willingness to fight for your country. Results for six different types of analyses. 13,670 observations.

These results align with our expectation that the Venezuelan collapse (and the subsequent large-scale migration) increased people's nationalistic attitudes. We capture these orientations with the notion of willingness to fight for one's country. The hypothetical scenario of joining a war to represent one's country allows us to evaluate people's attachment to their country. Citizens with low national attachment should be less willing to fight for their country than those with a high national attachment. However, we acknowledge that the outcome measure is different and that the exposure indicator has important limitations, so we interpret these results as suggestive of immigration's impact on nationalism in South America.

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