APPENDIX

Social Capital and Voter Turnout – Matthew D. Atkinson and Anthony Fowler

**Table A1. Sample Summary Statistics**[[1]](#footnote-1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Mean | Median | Min | Max | St Dev | Observations |
| Population 2000 | 12198 | 9517 | 413 | 49462 | 9706 | 325 |
| Population Density | 101.7 | 51.1 | 0.9 | 1743.3 | 180.7 | 296 |
| Pct Some High School | 11.2 | 9.4 | 1.2 | 55.0 | 7.4 | 325 |
| Pct Some College | 4.3 | 3.5 | 0.4 | 28.4 | 3.2 | 325 |
| Pct ≤ Min. Wage | 16.6 | 13.4 | 1.5 | 58.0 | 10.7 | 325 |
| Pct > 5x Min. Wage | 2.5 | 1.8 | 0 | 14.3 | 2.2 | 325 |
| Pct > 10x Min. Wage | 0.9 | 0.6 | 0.0 | 5.6 | 0.9 | 325 |
| Pct Agriculture | 51.3 | 51.1 | 1.3 | 96.4 | 22.7 | 325 |
| Pct Construction | 10.3 | 9.4 | 0.2 | 34.1 | 6.1 | 325 |
| Pct Finance | 0.1 | 0.1 | 0 | 1.8 | 0.2 | 325 |
| Pct Health | 1.3 | 1.0 | 0 | 8.4 | 1.1 | 325 |
| Pct Real Estate | 0.1 | 0.0 | 0 | 0.8 | 0.1 | 325 |
| Pct Transportation | 2.4 | 1.8 | 0 | 17.9 | 2.4 | 325 |
| Pct Commerce | 10.3 | 10.0 | 0 | 40.7 | 5.9 | 325 |
| Pct Education | 4.2 | 3.3 | 0 | 21.3 | 3.3 | 325 |
| Pct Government | 3.1 | 2.8 | 0.3 | 14.8 | 1.9 | 325 |
| Pct Manufacturing | 15.6 | 12.0 | 0.7 | 57.0 | 12.5 | 325 |
| Pct Mining | .7 | .1 | 0 | 27.0 | 2.4 | 325 |
| Pct > 70 Years Old | 1.5 | 1.3 | 0.3 | 5.1 | 0.7 | 325 |
| Pct < 18 Years Old | 44.5 | 44.9 | 27.8 | 56.8 | 5.2 | 325 |
| Pct Catholic | 91.2 | 93.4 | 51.7 | 99.8 | 8.2 | 325 |
| Pct PAN | 29.7 | 31.1 | 2.5 | 65.2 | 14.5 | 325 |
| Pct PRI | 52.2 | 51.9 | 14.3 | 82.6 | 12.6 | 325 |
| Pct PRD | 18.1 | 15.7 | 0.6 | 75.1 | 13.5 | 325 |
| Turnout 1991 | 44.0 | 44.3 | 11.4 | 98.3 | 14.5 | 322 |
| Turnout 1994 | 64.0 | 65.1 | 19.5 | 90.9 | 12.4 | 323 |
| Turnout 1997 | 51.4 | 50.8 | 12.7 | 94.8 | 12.6 | 325 |
| Turnout 2000 | 61.5 | 61.8 | 27.0 | 96.9 | 10.2 | 325 |
| Turnout 2003 | 45.8 | 43.9 | 1.2 | 97.7 | 14.8 | 322 |
| Turnout 2006 | 65.0 | 64.7 | 33.8 | 96.7 | 9.9 | 320 |
| Turnout 2009 | 57.0 | 54.5 | 12.3 | 99.4 | 16.0 | 318 |
| Fiesta | 0.16 | 0 | 0 | 1 | 0.37 | 325 |

**Table A2. Placebo Regressions to Test for Balance**[[2]](#footnote-2)

|  |  |  |  |
| --- | --- | --- | --- |
| Dependent Variable | Coefficient | Standard Error | P-value |
| Log Population | -.120 | .097 | .217 |
| Log Pop. Density | -.007 | .016 | .664 |
| Pct Some High School | -1.272 | .683 | .063 |
| Pct Some College | -.409 | .283 | .150 |
| Pct ≤ Minimum Wage | .765 | 1.150 | .507 |
| Pct > 5x Min. Wage | -.479 | .182 | .009 |
| Pct > 10x Min. Wage | -.168 | .080 | .036 |
| Pct Agriculture | 3.164 | 2.394 | .187 |
| Pct Construction | .303 | .679 | .655 |
| Pct Finance | -.018 | .022 | .409 |
| Pct Health | -.138 | .103 | .181 |
| Pct Real Estate | -.017 | .012 | .165 |
| Pct Transportation | -.261 | .197 | .186 |
| Pct Commerce | -.712 | .624 | .255 |
| Pct Education | -.320 | .324 | .324 |
| Pct Government | -.524 | .164 | .002 |
| Pct Manufacturing | -1.236 | 1.337 | .356 |
| Pct Mining | -.150 | .155 | .333 |
| Pct > 70 Years Old | -.003 | .070 | .968 |
| Pct < 18 Years Old | .413 | .500 | .410 |
| Pct Catholic | -.010 | .009 | .279 |
| Pct PAN | -2.730 | 1.241 | .029 |
| Pct PRI | .058 | 1.142 | .959 |
| Pct PRD | 2.672 | 1.296 | .040 |

**Figure A1. Distribution of Propensity Score for Both Comparison Groups**[[3]](#footnote-3)



**Table A3. Difference in Mean Voter Turnout by Year**[[4]](#footnote-4)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Fiesta w/in 2 Weeks? | |  |  |  |
| Year | No | Yes | Difference | Standard Error | P-Value |
| 1991 | 44.76 | 40.22 | -4.54 | 1.97 | .024 |
| 1994 | 64.52 | 61.06 | -3.47 | 1.94 | .078 |
| 1997 | 51.92 | 48.53 | -3.39 | 1.91 | .080 |
| 2000 | 62.06 | 58.87 | -3.19 | 1.75 | .072 |
| 2003 | 46.58 | 41.93 | -4.65 | 1.73 | .008 |
| 2006 | 65.60 | 62.21 | -3.40 | 1.68 | .048 |
| 2009 | 57.62 | 53.55 | -4.08 | 2.36 | .088 |
| Pooled | 56.16 | 52.27 | -3.89 | 1.15 | .001 |

**Table A4. The Effect of Fiestas on Voter Turnout: Robustness Checks**[[5]](#footnote-5)

|  |  |  |  |
| --- | --- | --- | --- |
| Model | Effect of Fiesta Treatment | Standard Error | P-value |
| No Controls | -3.452 | 1.038 | .001 |
| Without Year Fixed-Effects | -3.466 | 1.034 | .001 |
| Without State Turnout | -3.817 | 1.152 | .001 |
| State Fixed Effects | -2.322 | .951 | .015 |
| 3 Population Variables | -3.625 | 1.045 | .001 |
| 7 Education Variables | -3.320 | 1.024 | .001 |
| 10 Wage Variables | -3.620 | 1.017 | <.001 |
| 18 Economic Variables | -3.004 | .969 | .002 |
| 10 Age Variables | -3.637 | 1.067 | .001 |
| 3 Partisan Variables | -3.180 | 1.012 | .002 |
| 5 Miscellaneous Variables | -3.283 | 1.053 | .002 |
| All Controls | -3.122 | .951 | .001 |
| Propensity Score Matching | -3.931 | 1.125 | <.001 |
| Nearest Neighbor Matching | -3.442 | .777 | <.001 |

**Figure A2. Robustness of the Fiesta Effect to Different Window Sizes**[[6]](#footnote-6)



Replicating the Findings in an Urban Setting

Our previous analysis has focused solely on Mexican municipalities with just one Catholic Church. Thus, our data set consists of primarily poor, rural, agricultural communities. The questions remain whether our results will generalize to other democratic communities. In order to ensure internal validity, we have limited our study to the subset of regions for which we can make valid inferences. To test for external validity, we turn to the Mexican city of Monterrey. This urban center looks nothing like the previous communities in our data set. Monterrey has over one million residents, a well regarded health care system, four major universities, and a GDP per capita of more than 45,000 U.S. dollars.

For every church in Monterrey, the local archdiocese website lists the saint’s day fiesta date and the neighborhoods served by the church. In many cases, we were able to match these listed neighborhoods to “secciones,” the smallest geographic unit for which electoral results were reported in 2006 and 2009. As a result, we have compiled a dataset of 584 neighborhoods served by 93 different churches for which we know the fiesta date and voter turnout levels for 2006 and 2009. With only 93 churches, two election years, and no census variables our tests will be much less precise than in our previous analysis. However, we can test for the fiesta effect just as before to see if fiestas have the same type of effect in an urban area.

The table below presents the results of this analysis. We conduct OLS to test whether neighborhood turnout changes when the church’s saint’s day fiesta occurs within two weeks of the election date. Both models control for the year, and model 2 includes partisan controls. The partisan controls are the proportion of the vote earned in each neighborhood by the three major political parties - the National Action Party, the Institutional Revolutionary Party, and the Party of the Democratic Revolution. Since we do not have census data for each neighborhood, we rely on these partisan variables to serve as a proxy for the social structure and unobserved characteristics of neighborhoods. These controls simply explain some of the variance in turnout and allow for a more efficient estimate.

As with the rural municipalities, we estimate a negative effect of the saint’s day fiesta on turnout in Monterrey. Model 2 estimates that the occurrence of a saint’s day fiesta within 2 weeks of an election reduces neighborhood turnout levels by 2.9 percentage points (p < .01). While the evidence is not as strong as before due to our lack of data, this analysis suggests that our findings in rural Mexico may apply to a much broader set of democratic communities. Saints Day Fiestas decrease voter turnout in Monterrey just as they do in rural communities, and the same mechanisms by which social capital decreases turnout in rural communities are present in urban centers.

**Table A5. The Effect of Fiestas on Turnout in Monterrey**

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
| Fiesta | -0.782 | -2.931 |
|  | (1.610) | (0.738)\*\* |
| Year Fixed Effects | X | X |
|  |  |  |
| Partisan Controls |  | X |
|  |  |  |
| Observations | 1160 | 1160 |
| R-squared | .07 | .48 |
| SER | 8.99 | 6.74 |

Church-clustered standard errors in parentheses

\*\* significant at 1%

1. Data on population density is missing for 29 municipalities. Turnout data is missing for a few municipalities in 1991, 1994, 2006, and 2009. [↑](#footnote-ref-1)
2. Each row represents a placebo regression where the dependent variable is regressed on the fiesta treatment, state turnout, and year fixed effects, closely mirroring the model in Column 1 of Table 1. The coefficient on the fiesta treatment is shown, along with its standard error (clustered by municipality). The table shows that the fiesta treatment is not meaningfully correlated with these demographic, economic, or political variables. To the extent that we do see statistically significant differences (earnings, government employment, and partisan support), these variables may not represent imbalance but actually downstream effects of fiestas and their negative effect voter turnout. Despite these possibilities of post-treatment bias, Table A3 shows that the empirical results are robust to the inclusion or exclusion of all of these covariates. [↑](#footnote-ref-2)
3. The distributions are estimated by a kernel density function. The propensity scores are estimated from a Logit model which regresses Fiesta on all census variables and year fixed effects. To avoid over-fitting, we using a jack-knife estimator which does not use observation “i” in determining the propensity score for that particular observation. Note that some of the variables included in the propensity model could actually be influenced by the treatment and the subsequent drop in turnout, so this graph may actually *understate* the comparability of the treated and untreated municipalities. [↑](#footnote-ref-3)
4. The table reports mean levels of voter turnout for our treated and untreated municipalities in each election. For each individual year, turnout in the treated municipalities is at least 3 percentage points lower, so our results are not sensitive to the inclusion or exclusion of particular years. Also, our results are not sensitive to modeling assumptions, because a simple difference in means yields the same estimate as the more complex regression models. For individual years, the standard errors allow for unequal variance between treatment groups (Huber-White standard errors), and for the pooled difference, the standard error allows for municipality specific correlation (municipality-clustered standard error). [↑](#footnote-ref-4)
5. All standard errors are clustered by municipality. The models above include year-fixed effects and state turnout, except rows 2 and 3 which exclude one at a time. Both matching estimators match on year exactly and include a linear bias adjustment. For both matching estimators, we report the standard errors proposed by Abadie et al. (2004). With propensity score matching, this procedure does not account for the uncertainty associated with the estimation of the propensity score. Many researchers bootstrap the standard errors in this case to account for such a problem. However, Abadie and Imbens (2008) show that the bootstrap does not yield valid standard errors for matching estimators. They argue that the closed-form standard errors are adequately conservative to account for uncertainty associated with the propensity score. For our pooled OLS and fixed effects estimates, we report municipality-clustered standard errors. In this case, they are nearly identical to standard errors calculated from a non-parametric bootstrap. [↑](#footnote-ref-5)
6. The figure presents the robustness of our main empirical result across different specifications of the fiesta treatment. Each point represents the coefficient on the fiesta treatment in a regression similar to Column 1 in Table 1. On the X axis, we vary the coding of the fiesta treatment. In the paper, we code the treatment to equal 1 if the fiesta occurs within 14 days of the election, but we can see that our result would have been nearly identical had we used any cutoff between 3 and 18 days. As expected, the treatment effect decays for very large windows, but our findings are not sensitive to an arbitrary choice about the size of the treatment window. The dotted lines indicate municipality-clustered standard errors. [↑](#footnote-ref-6)