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Notes on recent elections

Does Election Day weather affect voter turnout? Evidence from Swedish elections

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ABSTRACT

Does rainfall during the Election Day reduce voter turnout? Previous research shows that in the US one inch of rain reduces turnout with about one percentage point. We turn to the Swedish context in order to test whether rainfall on Election Day have the same impact in a high turnout context. We move beyond previous research by testing the impact of GIS-interpolated rainfall on three different datasets that allows us to view the issue both from a wide time frame as well as with high precision as for turnout measures: (a) aggregate turnout data for Sweden's 290 municipalities, (b) individual level data from the Swedish National Election Study and (c) data from a register-based survey on voter turnout. In none of the three datasets do we find robust negative effects of rain.

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In this research note we investigate whether rainfall during the Election Day reduces voter turnout. According to widespread belief, expressed in news media and among academics, rainfall on Election Day is expected to lower voter turnout (Franklin, 2004; The New York Times, 2006; Washington Post, 2008). However, only a handful of studies provide solid empirical evidence to support this claim (Gomez et al., 2007a; Knack, 1994; Gatrell and Bierly, 2002). In the most sophisticated analysis to date, Gomez, Hansford and Krause (henceforth GHK) find a negative effect of rain. They show that one inch of rain reduces turnout with about one percentage point in presidential elections in the US, i.e. a small, but statistically significant effect.

The underlying assumption for the hypothesis that rainfall decreases turnout is that voters assess the costs and benefits associated with voting. If the benefits outweigh the costs, individuals will cast their votes, and if not, they will abstain (Wolfinger and Rosenstone, 1980; Aldrich, 1993). However, the studies on the impact of rain during Election Day mentioned above all investigate turnout in the US (Gomez et al., 2007a; Knack, 1994; Gatrell and Bierly, 2002), a country where, in a comparative perspective, the costs associated with voting are high (even when it does not rain) (Powell, 1986). Moreover, the first past the post electoral system make it extremely improbable that a single vote will affect the outcome in many states. Hence, ambiguity surrounds the generalizability of these findings: can the negative effects of rain on voter turnout also be found in other contexts where the costs of voting are substantially lower, and the benefits of voting are higher?

In an attempt to answer this question we turn to such a context: Sweden. Hence, the study makes it possible to compare the effect of a small increase in voting costs, i.e. rain, in different cultural contexts. Within the group of industrialized western countries, the Swedish electoral system is in many crucial aspects different from the one in the US. Also, the turnout levels are consistently much higher in Sweden (between 80 and 92 percent between 1976 and 2010).

To set up the test as rigorously as possible, we test the impact of rainfall using three different datasets. We use

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data on aggregate levels of turnout, which mimic as closely as possible the research design employed by GHK, to test the generalizability of their findings. In addition, we also present results from two individual-level datasets covering more than 150,000 individuals as additional checks on the robustness of the findings. The amount of rainfall in each of the 290 municipalities of Sweden is estimated by means of Geographic Information System (GIS) interpolation of data from the Swedish Meteorological and Hydrological Institute, stemming from about 750 whether stations in all of Sweden's 290 municipalities during the period 1976–2010. We then estimate the effects of rainfall on turnout levels at both municipal and individual levels.

In none of the three datasets do we find robust negative effects of rain. The main contribution of this study is that the negative effects of additional costs of voting such as rain during Election Day found in US studies do not seem to be generalizable to a context where the overall costs of voting are lower and the benefits of voting are higher. We do not test the effects of costs and benefits directly, but since it is found that the effect of rain on voting varies between Sweden and the US we suggest that the most reasonable theoretical explanation is the different levels of costs and benefits of voting in the two countries. This finding is of importance not only to those interested in explaining why people turn out to vote, but also because Election Day weather is one of the few, and perhaps the most frequently used, instrumental variable for voter turnout (Hansford and Gomez, 2010). Hence, since the results suggest that the effect of Election Day weather differs between contexts such as Sweden and the US, caution should exercised before using it as an instrumental variable in other contexts.

1. The costs and benefits of voting

In the rational choice model of voting, each voter is assumed to calculate the costs and benefits associated with casting a ballot (Aldrich, 1993; Blais, 2000, 2006). According to this theory, voters will cast their votes if the expected benefits outweigh the costs. When reducing the costs of voting by making the process of casting a vote more convenient, voter turnout generally increases, and vice versa. For example, factors which decrease the costs of voting such as possibilities for early voting, or holding elections on Saturdays and Sundays tend to increase turnout (Gronke et al., 2007; Franklin, 2004). On the other hand, factors increasing the costs of voting, such as a long distance to the voting booth or changes of the location of the polling station decrease turnout (Dyck and Gimpel, 2005; Brady and McNulty, 2011; Gimpel and Schuknecht, 2003.

Only a few previous studies evaluate the impact of rain empirically and these studies show contradictory results. Knack uses individual level data from the American National Election Studies conducted in 1984, 1986 and 1988 to gauge the effects of rain on turnout (Knack, 1994). Knack finds no overall effects of rain on turnout, but a negative effect among those with low sense of civic duty. However, significant negative main effects are found by Shachar and Nalebuff (1999), Eisinga et al. (2012), Gatrell and Bierly (2002) and Gomez et al. (2007a) The study by GHK is the most sophisticated to date: They use GIS-interpolated weather data from over 20,000 weather stations for 14 US presidential elections (1948–2000). Since they employ a panel data design including 3115 counties in 14 elections they get 43,340 observations and thus have substantial variation in levels of rain and turnout. However, the estimated effect of rain in the study by GHK is very small: one inch of rain during election day, which implies heavy downpour, is only expected to reduce turnout by 0.83 percentage points. When they include county fixed effects, the effect of one inch rain is amplified to a decrease in turnout with 0.98 percentage points (Gomez et al., 2007b). Moreover they find that rain increases the vote shares for republicans (as a consequence of voter turnout among democrats presumably being more easily negatively affected by additional costs of voting). According to GHK the weather may have affected the outcomes of the presidential elections in 1960 and 2000.

Moreover, in a US study by Fraga and Hersh (2010) it is tested whether Election Day rainfall has the same effect in competitive elections as in uncompetitive elections. Fraga and Hersh show that in competitive states where stakes are high, Election Day rainfall has no substantive impact. However, in uncompetitive states where the benefits of voting are lower, it is more likely that a small additional cost will tip the scales against voting.

2. The swedish context

The Swedish election system is based on proportional representation. Every four years (every three years until 1994), elections are held on the same day to the national parliament (the Riksdag), the regional parliaments and the local parliaments. The party lists are closed but voters are allowed to cast a personal vote for a candidate on the party list. A special version of the Sainte-Laguë method in which the first divisor is replaced by 1.4 is utilised to count the votes. Compared to the standard Sainte-Laguë method, the Swedish version gives a slight benefit to large parties. Sweden is divided into 29 constituencies. The national parliament has 349 seats, 310 of them are permanent seats distributed by constituencies on the basis of their population entitled to vote, while the remaining 39 are adjustment seats, which are there to secure proportionality. There is a four per cent threshold which parties have to exceed in order to get representation in the parliament. We should keep in mind that most previous studies on rain and voting have been conducted in a very different context: US presidential elections. The cost of voting is higher in the US since, for example, voters need to register in order to be able to vote and the likelihood that a vote should be pivotal is most often lower since all states apply a winner-takes-all rule when deciding on the votes in the electoral college.

In a comparative perspective voter turnout is relatively high in Sweden. During the last five decades the highest level of turnout in Swedish parliamentary elections was 92 percent (1976), while the lowest level was 80 percent (2002). The decline in turnout during the last decades has been weaker in Sweden than among Western democracies in general. Since 2002 voter turnout has increased slightly in Sweden (Persson et al., 2013).

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