

Voter Partisanship and the Effect of Distributive Spending on Political Participation.

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December, 2011

Abstract:

Do distributive benefits increase voter participation? We argue that the government's delivery of distributive aid increases the incumbent party's turnout but decreases opposition party turnout. The intuition here is that an incumbent who delivers distributive benefits to the opposing party's voters partially mitigates these voters' ideological opposition to the incumbent, hence weakening their motivation to turn out and oust the incumbent. We corroborate these predictions using individual-level data on FEMA hurricane disaster aid awards in Florida, linked with voter turnout records from the 2002 (pre-hurricane) and 2004 (post-hurricane) elections. In particular, FEMA aid delivered during the week just before the November 2004 election had an especially large effect, increasing the probability of Republican (incumbent party) turnout by 5.1% and decreasing Democratic (opposition party) turnout by 3.1%. By contrast, we conduct several placebo tests showing that FEMA aid delivered immediately after the November 2004 election had no effect on election-day turnout.

Do government distributive benefits increase voter turnout? Scholars have long argued that non-means-tested entitlement programs cause increased turnout among their beneficiaries. For example, the recipients of agricultural subsidies (Wolfinger and Rosenstone 1980), Social Security (Campbell 2002), Medicare and veterans' benefits (Verba, Schlozman, Brady, and Nie 1993; Mettler and Stonecash 2008) exhibit higher turnout rates than non-recipients. At the aggregate level, counties and congressional districts respond to increased distributive spending with higher turnout (Ansolabehere and Snyder 2006; Matsubayashi and Wu 2009). A commonly hypothesized explanation for this positive turnout effect is Seymour Martin Lipset's (1960) classic argument that one's decision to turnout depends upon the perceived "relevance of government policies to the individual" (190). Under this theory, as articulated by subsequent scholars (e.g., Campbell 2002; Wolfinger and Rosenstone 1980), the delivery of distributive benefits motivates recipients to protect their stake in these spending programs by participating in politics through voting.

However, there is reason to question whether this positive relationship between distributive benefits and turnout should hold for all voters, regardless of their partisanship. A voluminous literature on political behavior, beginning with *The American Voter*, argues that voters' responses to political events are conditioned by their partisanship. Voters' partisan identification serves as a "perceptual screen through which the individual tends to see what is favorable to his partisan orientation" (Campbell et al. 1960, 133). Partisanship affects voters' subjective judgments, such as their approval of Presidential performance (Bartels 2002), as well as objective evaluations, such as assessments of the economy (Gerber and Huber 2009; 2010).

In this paper, we draw upon the political participation theory described by Lipset (1960), Wolfinger and Rosenstone (1980) and Campbell (2002), and we revise and extend this classic theory to account for voters' partisan biases in their retrospective evaluations. Our theory preserves these authors' original intuition that the recipients of distributive benefits are motivated to vote in

order to protect their future benefits. But our theory also revises this argument by accounting for voters' partisan biases in deciding whether to turn out. Our theory predicts that distributive spending can affect voter turnout in opposite directions, depending on the voter's partisanship: Voters who share the incumbent's partisanship respond to benefits with *increased* turnout. But voters who align with the challenger's party respond to benefits with *decreased* turnout.

The intuition behind this asymmetric result is as follows. Each voter has an ideological preference for either the left or right-wing party, but voters also generally prefer politicians who prioritize the delivery of distributive benefits. Hence, a voter who receives benefits from a same-party incumbent will respond with increased turnout in order to enhance the probability of re-electing the incumbent. By contrast, a voter who identifies with the challenger's party prefers to expel the incumbent for ideological reasons. But if the incumbent delivers benefits to this opposite-party voter, the voter may respond by *not turning out* to vote, as the incumbent's distributive generosity has mitigated the voter's motivation to oust the incumbent.

Borrowing from the vast literature on retrospective voting (e.g., Fiorina 1981; Ferejohn 1986), our theory allows voters to retrospectively judge the incumbent's distributive policy. The voter observes the incumbent's disaster aid policy and forms updated beliefs about the incumbent's prioritization of disaster aid. Hence, an incumbent who delivers pre-election aid develops a reputation as being likely to deliver such aid in the future, thus enhancing her favorability among voters regardless of partisanship. If the incumbent is right-wing, then this enhanced reputation may convince a left-wing voter to simply abstain from voting, as the incumbent's superior record on disaster aid has weakened the voter's overall aversion to the incumbent and motivation to oust her.

Empirically, we test these predictions of this formal model using a detailed records of 1.1 million households that applied for Federal Emergency Management Agency (FEMA) disaster assistance during the summer 2004 hurricane season, just prior to the November 2004 Presidential

election. We link these applications to voter registration and turnout records. By comparing individual voters' turnout in the 2002 (pre-hurricane) and 2004 (post-hurricane) elections, we find that the awarding of FEMA aid *increases* Republican (incumbent party) voters' turnout while *decreasing* Democratic (challenger party) turnout in November 2004. We also analyze FEMA aid awarded at the voting precinct level, finding that the awarding of FEMA aid causes a statistically significant increase in President Bush's vote share in November 2004.

Two further findings help to establish the causal direction of this effect. First, FEMA awards delivered in the week *just before* the November 2004 election had an abnormally large effect, increasing the probability of Republican (incumbent party) turnout by 5.1% and decreasing Democratic (opposition party) turnout by 3.1%. By contrast, our placebo tests find that FEMA aid delivered immediately *after* the November 2004 election had no effect on election-day turnout.

We proceed as follows. The first section intuitively describes our theory and explains the two testable predictions of this theory concerning the effect of disaster aid on voter behavior. A more detailed formal model of this theory is presented in the Online Appendix. The second section describes the process by which FEMA distributed disaster aid to hurricane victims in 2004. Third, we conduct several tests of the formal model's predictions using our individual-level data on FEMA aid applications, linked to individual voter turnout records and precinct-level election results. Finally, we address eight empirical concerns and present robustness checks to address these issues.

A Theory of Disaster Aid and Voter Turnout

In this section, we intuitively present this manuscript's theory and explain the two testable predictions of the theory. In the Online Appendix, we present a formal model that derives these two predictions. Because of space constraints, this section simply summarizes the key features and

assumptions of the model and informally explains the intuitive logic of the theory.

1) *Politicians' Ideologies and Types:* To set up our theory, suppose the incumbent president is ideologically right-wing, and the challenger candidate is left-wing. We choose this illustration in order to mirror the empirical setting of this manuscript, which examines the 2004 election with a Republican incumbent and a Democratic challenger.

We assume there are two types of politicians: Those who prioritize disaster aid and those who do not. A president might not prioritize disaster aid because she instead focuses her attention and public resources on other policy issues. In our formal model, we assume that Nature randomly chooses each politician's type, and we assume these two politician types are distinguished by their utility preferences over delivering disaster aid. A politician's type is independent of her ideology.

Voters do not become aware of a politician's type until they observe the president making a policy choice on disaster aid. Hence, having observed the incumbent in office during the previous term, voters gain certainty about the incumbent's type, but they remain uncertain about the challenger's type. As an illustrative example, voters might have been uncertain about President Bush's type prior to September 2005. But after the intense public scrutiny of FEMA's response to Hurricane Katrina, voters updated their beliefs and developed stronger and more specific views about the Bush administration's prioritization of hurricane relief efforts. In this sense, an incumbent with a reputation for delivering disaster aid enjoys a "valence advantage," independent of voters' preferences over candidates on the ideological dimension, as modeled by Groseclose (2001).

2) *Voter interests:* Following Dixit and Londregan (1996), Persson and Tabellini (2000), Stokes (2005), and other models of distributive politics, we first assume that voters have ideological preferences as well as a preference for receiving distributive benefits. Second, we follow previous models by assuming that the act of turnout is costly for voters (e.g., Aldrich 1993). Hence, a voter turns out only if her preference for her favored candidate is sufficiently strong.

Consequently, in our theory, the delivery of hurricane aid to the voter prior to the election can affect voter behavior in one of three ways. If the voter has a strong ideological preference for the incumbent, then delivering aid prior to the election may further motivate the voter to turn out in order to secure the incumbent's re-election. If the voter has a strong ideological preference for the challenger, then pre-election aid from the incumbent may induce the voter to stay home by mitigating the voter's hostility toward the incumbent. And finally, if the voter is ideologically indifferent between the two candidates, then the delivery of aid might sway the voter's preference.

3) Why Does Disaster Aid Affect Republican and Democratic Turnout Differently?

Regardless of voter ideology, the delivery of pre-election disaster aid is an informative signal that enhances the voter's belief that the incumbent will again deliver aid in the future. Hence, regardless of who the voter prefers ideologically, this enhanced belief always increases the voter's expected utility from having the incumbent reelected.

Whether this enhanced belief increases or decreases turnout depends on the voter's ideological preference over the two candidates. If the voter is right-wing and already prefers the incumbent on ideological grounds, then this enhanced belief induced by disaster aid simply provides yet an additional motivation to turn out and reelect the incumbent. Hence, for a Republican voter, the delivery of pre-election disaster aid increases the probability of turnout.

But disaster aid would have the opposite effect on turnout for a Democratic voter. If she turns out, the left-wing voter will always prefer the left-wing challenger candidate on ideological grounds. Hence, the left-wing voter's probability of turnout depends on how strongly she prefers the challenger over the incumbent. The delivery of pre-election disaster aid to the left-wing voter enhances the voter's perception of the incumbent, thus mitigating the voter's motivation to oust the incumbent. This decreased motivation to vote the incumbent out of office decreases the Democratic aid recipient's probability of turnout.

We can summarize this first prediction of our theoretical model as follows:

Hypothesis 1: *The delivery of disaster aid prior to the election causes an increase in turnout for a Republican recipient but a decrease in turnout for a Democratic recipient.*

This hypothesis is stated formally as Proposition 1 in our formal model in the Online Appendix.

4) *Why Does Disaster Aid Increase the Incumbent's Vote Share?* In Hypothesis 1, the delivery of aid increases Republican turnout while decreasing Democratic turnout. Furthermore, as noted above, conditional on turning out, the partisan Democratic and Republican voters support the challenger and the incumbent in the election, respectively. Hence, disaster aid causes either an increase in the incumbent's *vote totals* or a decrease in the challenger's *vote totals*, depending on whether the voter is left or right-wing. In either case, the net effect on the incumbent's *vote share* is therefore always a positive one.

To illustrate this logic more concretely, consider a heavily left-wing precinct with 7 Democrats and 3 Republicans voters. If the delivery of aid causes a one-voter decrease in Democratic turnout, then we are left with 6 Democrats and 3 Republicans. Hence, the Republican vote share has actually increased from 30% to 33.3%. Therefore, so long as the electorate consists of a mix of Democrats and Republicans, the delivery of aid always increases the Republican incumbent's overall vote share in the election. We summarize this testable prediction as:

Hypothesis 2: *The delivery of disaster aid prior to the election causes an increase in the right-wing incumbent candidate's electoral vote share.*

This hypothesis is consistent with the previous work of Healy and Malhotra (2009) and Reeves (2011), who find that voters generally reward incumbent presidents for disaster declarations and for disaster relief spending. Our theory builds upon this previous work in specifying the turnout changes caused by disaster responses that bring about the increase in incumbent votes.

In this section, we have not addressed the possibility that ideologically moderate voters may be persuaded by disaster aid into voting for the incumbent rather than the challenger. We

address this scenario in the formal model in the Online Appendix. We do not elaborate on it in this section's informal theory because we cannot empirically test this part of our formal model, as our voter registration data lack a reliable way to identify ideologically moderate voters. In the following section, we describe the context of the FEMA disaster aid data, and we then use this data to test the two predictions of our theory. We focus primarily on testing the predictions of Hypothesis 1, and we test Hypothesis 2 in the *Alternative Causal Explanations* section.

The Distribution of FEMA Disaster Aid

In this section, we describe three important characteristics of FEMA disaster aid.

1) *Presidential Disaster Declarations.* First, residents of all 67 counties in Florida were eligible to apply for FEMA aid. In the twelve weeks prior to the November 2004 Presidential election, Florida was struck by four hurricanes of at least Category II strength. Hurricanes Charley (Category IV), Frances (Category II), Ivan (Category III), and Jeanne (Category III) made landfall throughout Florida, prompting President Bush to issue disaster declarations, with eligibility for individual disaster aid, for all 67 of Florida's counties during the 2004 hurricane season.

Hence, consistent with previous literature on Presidents' disaster responses, the distribution of FEMA aid in our data does not manifest from any strategic county-level targeting of Presidential disaster declarations *within* Florida. Reeves (2011) finds that the President is more likely to issue disaster declarations in states that are electorally competitive, while Garrett and Sobel (2002) and Downton and Pielke (2001) observe a spike in declarations during election years. Both of these conditions apply to our study: The FEMA aid we examine was delivered just prior to the November 2004 election, and Florida was a competitive swing state in both the 2000 and 2004 Presidential contests. The fact that all 67 Florida counties were declared eligible for individual aid is therefore consistent with past studies' findings on the targeting of disaster declarations *across* different states.

2) *The Universal Nature of FEMA Aid.* Second, FEMA distributed hurricane disaster aid through a universal, non-means-tested program. After President Bush's disaster declarations, Florida residents were eligible to apply for aid under FEMA's Individuals and Households Program (IHP). Officially, IHP, authorized by the Stafford Act of 1988 (P.L. 93-288) and the Disaster Mitigation Act of 2000 (P.L. 106-390), provides up to \$25,000 of assistance to victimized households to pay for "necessary expenses and serious needs" not covered by insurance (44 C.F.R. § 206.110a). FEMA most frequently awards IHP aid to households to fund temporary housing, to repair damaged residences, to replace damaged property, such as furniture and electronics, and to pay for medical, funeral, and other personal expenses caused by the hurricanes.

Disaster aid under IHP cannot be awarded or restricted on the basis of residents' income, a statutory mandate codified in 42 USC § 5163 and 42 USC § 5174(b)(1) and implemented in 44 C.F.R. § 206.113. Instead, the primary restrictions are that IHP aid only covers inspector-verified damage at an applicant's primary residence, FEMA awards may not duplicate insurance payouts, and households may not receive more than \$25,000 in total aid. In particular, the prohibition against duplicating insurance payouts had the effect of disqualifying many wealthier homeowners from receiving some categories of FEMA aid. Nevertheless, many households with flood insurance still qualified for FEMA aid to cover uninsured possessions and expenses.

The universal nature of FEMA disaster aid is an important distinction, given the previous literature on turnout. Scholars of political participation have found that social spending programs mobilize voter turnout only when benefits are distributed under universal, non-means-tested programs (eg, Verba, Schlozman, and Brady 1995; Mettler 2005). For example, Mettler and Stonecash (2008) find that the beneficiaries of universal programs such as Veterans Benefits and Medicare vote at higher rates than non-beneficiaries. By contrast, Soss (1999; 2002) and Bruch, Ferree, and Soss (2009) find that means-tested welfare programs stigmatize voters, thus possibly

discouraging them from political participation.

Hence, this existing literature suggests that FEMA disaster aid, which is universally available to hurricane victims regardless of their income status, might mobilize recipients to vote in order to protect their stake in program benefits. Our contribution to this existing literature is to explain why this mobilization logic is conditional on recipients' ideological proximity to the incumbent government: The delivery of benefits by a Republican administration to Republican recipients should indeed mobilize their turnout. But the delivery of benefits by a Republican administration to Democratic recipients may induce a decrease in their turnout, as the recipients' stake in protecting their benefits decreases their motivation to oust the Republican incumbent.

3) *The FEMA Aid Decision Process.* Residents self-select into applying for IHP aid simply by providing their names and contact information to FEMA in person, by telephone, or through FEMA's internet website. Although applicants may describe the hurricane damage to their property, they are not permitted to request a specific aid amount. Nor does an applicant's description of damage either limit or enhance the amount of aid his or her household is eligible receive.

Instead, a FEMA inspector visits each applicant's residence to complete a checklist of damaged property and to estimate the severity of any such damages. By protocol, FEMA personnel check for a standard list of damaged areas in each home, regardless of whether the applicant had reported damages in such areas. Specifically, the FEMA inspector assigns a score of "X", "Y," or "Z" to each room and each area of the residence, indicating the severity of the hurricane damage. For each particular type of room (eg, kitchen, living room) and for a particular level of damage ("X", "Y", or "Z"), FEMA awards a pre-determined amount of assistance, regardless of the actual value of the applicant's pre-hurricane property. Hence, the applicant has no formal opportunities to strategically manipulate the FEMA aid process by exaggerating the severity of hurricane damage.

In the aftermath of the 2004 Florida hurricanes, FEMA received applications for IHP aid

from 1.1 million unique households. FEMA approved aid awards for about 40% of these applications, distributing over \$1.2 billion in total assistance. The size of these awards varied widely, ranging from under \$100 to \$25,000, depending upon the FEMA inspectors' assessments of damages. Figure App.1 of the *Supplemental Appendix* details the distribution of these awards.

By requiring inspectors to check for residential damage, FEMA's inspection procedures effectively distributed IHP disaster aid most heavily to areas that experienced the most severe hurricane storms. We illustrate this geographic pattern in Figure App.2 of the *Supplemental Appendix*, which depicts the maximum wind speeds observed during Hurricane Charley, the first declared disaster of the 2004 Atlantic hurricane season (FEMA Disaster #1539). The bright pink areas in this map represent the highest measured winds of over 130 miles per hour, reflecting that Hurricane Charley entered Florida's Gulf coast through Cape Coral, traveled northeast across the state, and exited Florida's Atlantic coast just south of Daytona Beach. The green dots on the map identify the geocoded locations of all Florida residents who applied for and successfully received some disaster aid under FEMA disaster #1539. Although aid recipients appear throughout the entire state, this map illustrates that the vast majority of the recipients were geographically concentrated along the center of Hurricane Charley's path as the storm crossed Florida.

The Effect of FEMA Aid on Individual Voter Turnout

This section analyzes the effect of FEMA disaster aid awards on individual voter turnout in November 2004. We track the turnout of FEMA aid applicants by matching the residential addresses listed on individual households' FEMA applications with the addresses listed on Florida voter registration and turnout records. In the aftermath of the 2004 hurricane season, several Florida newspapers made repeated requests under the Freedom of Information Act (FOIA) to access records on individual FEMA aid applicants. FEMA officials initially refused all of these FOIA

requests. However, several federal lawsuits, culminating in the 11th US Circuit Court of Appeals' June 22, 2007 decision in *News-Press v. U.S. Department of Homeland Security* (No. 05-16771 and No. 06-13306), forced FEMA to turn over detailed records on the Florida FEMA aid applicants. These records contain the addresses of the 1.1 million households that applied for aid and the dollar amounts awarded to the 40% of applicants that were approved for aid.

Using these data, we match the FEMA applicant addresses to Florida voter registration forms, on which voters must self-report their residential addresses. We use these records to identify all registered voters whose household applied for FEMA aid in 2004. Finally, using voter history files provided by counties' boards of elections, we track each registered voter's turnout in the November 2002 (pre-hurricane) and 2004 (post-hurricane) general elections.

In this section's empirical analyses, we include only Florida residents who satisfied all four of the following criteria: 1) The individual lives in a household that applied for FEMA aid during the 2004 hurricane season; 2) FEMA took action on the household's aid application prior to the November 2004 general election; 3) The individual was eligible and actively registered to vote in both the 2002 and 2004 general elections; and 4) The individual was either a registered Democrat or Republican as of the November 2004 election. There were 268,752 registered voters who satisfied all four of these criteria, and these voters collectively exhibited a 75% turnout rate in the November 2004 Bush-Kerry Presidential election.

Registered voters are not required to affiliate with a party, but most do so because Florida operates closed presidential primaries. Table App.1 of the *Supplemental Appendix* details the breakdown of FEMA applicants by party affiliation, showing that 83% of registered voters who applied for aid are affiliated with either the Democratic or Republican parties. Additionally, the histograms in Figure App.1 of the *Supplemental Appendix* illustrate the distribution of FEMA award sizes across the Democratic and Republican registrants in our data. These histograms show

that FEMA applicants from the two parties received a comparable range of award sizes. The mean award size for approved applicants in these data was \$682.

Eq. 1 is a test of *Hypothesis 1*, which predicts that with a right-wing incumbent, distributive aid should increase right-wing voter turnout while decreasing left-wing turnout. Specifically, *Eq. 1* regresses an applicant's November 2004 turnout onto the applicant's turnout in November 2002 and whether the applicant was approved for FEMA disaster aid. The basic logit model is:

$$\text{logit}[\text{Pr}(\text{Voted } 2004_i)] = \begin{cases} \alpha + \beta_A \cdot \text{Application Approved}_i + \beta_{RA} \cdot (\text{Republican}_i \times \text{Application Approved}_i) \\ + \beta_R \cdot \text{Republican}_i + \beta_{02} \cdot (\text{Voted } 2002_i) + \varepsilon_i, \end{cases} \quad (1)$$

where *Application Approved_i* indicates whether the applicant was awarded aid. *Voted 2002_i* and *Voted 2004_i* indicate whether applicant *i* voted in the 2002 and 2004 elections, respectively, and *Republican_i* is an indicator for registered Republicans; all other voters are registered Democrats.

[TABLE 1 ABOUT HERE]

Effect of FEMA Aid on Turnout Probability: In Table 1, Model 3 estimates *Eq. 1* using the full set of Democratic and Republican voters, and Models 1 and 2 estimate *Eq. 1* by examining Democrats and Republican voters separately. In the Online Appendix (Table App.2), we also re-estimate the full *Eq. 1* models using standard errors clustered at the county level.

Overall, the Table 1 results corroborate our *Hypothesis 1* predictions. We use CLARIFY (King, Tomz, and Wittenberg 2000) to interpret the following Table 1 results. In Model 3, the awarding of FEMA aid to a Republican applicant who did not vote in 2002 *increases* her probability of turnout in November 2004 by 2.1 percentage points, from 50.8% to 52.9%. The simulated 95% confidence interval for this estimated turnout effect is [+1.3%, +2.9%]. But for a similar Democratic applicant, FEMA aid causes a 0.9 percentage *decrease* in turnout probability, from 47.8% to 46.9%. Using CLARIFY, the 95% confidence interval for this estimated turnout effect is [-0.2%, -1.6%].

Control Variables: In Models (4) to (6) of Table 1, we control for several hurricane-related and demographic variables. We geocode the voters in the data using the home addresses listed on their voter registrations. Using NOAA satellite data with discrete wind vectors recorded during each major hurricane, we then interpolate the hurricane winds experienced at each voter's residential location. In the Table 1 models, we control for the *Maximum Wind Speed*, measured in miles per hour, at each voter's residence during the 2004 hurricane season. We also control for the *Voter's Gender*, the *Voter's Age*, *African-American Voters*, the *Median Household Income* of the census block group in which the voter resides, and the *Median Home Value* in the block group. We also include *County Fixed Effects* in these expanded models. The estimated turnout effects of FEMA aid remain comparable in direction and significance in these expanded models.

Effect of FEMA Aid Delivered One Week Before the Election: We intuitively expect the effect of aid awarded just prior to the election to be especially large. To test this intuition, we divide all FEMA awards into two groups: 1) Awards delivered during the week prior to the election (5% of all awards), Oct. 27 to Nov. 2; and 2) Awards delivered at earlier times (95% of all awards).

We then estimate the effects of awards delivered just prior to the election. In the Online Appendix, Table App.3 presents the full model specifications and coefficient estimates, but we summarize the estimated turnout effects here. FEMA awards delivered one week prior to the election cause a +5.1% increase in the probability of turnout for a Republican who previously did not vote; the confidence interval for this effect is [+2.9%, +7.4%], estimated using CLARIFY. For a similarly situated Democrat, the effect of receiving FEMA aid one week before the election is a 3.1% decrease in the probability of turnout, with a confidence interval of [-1.2%, -5.0%]. Hence, we find that FEMA aid delivered one week before the election has an abnormally large effect on Republican and Democratic turnout. We later show in our placebo tests that FEMA aid delivered just after the election has no significant effect on turnout, providing further support for our

hypothesized causal direction.

Effect of FEMA Award Sizes: Next, we examine the turnout effects of varying award sizes. FEMA awards vary widely in size, and although our theory does not incorporate this complexity, we intuitively expect that larger award sizes should cause larger positive and negative turnout effects for Republicans and Democrats, respectively. Most awardees received under \$2,000, but awards ranged up to \$25,000. Because of this significant right tail, we log each applicant's award amount, and Table App.4 of the Online Appendix re-estimates all of the Table 1 models by replacing *Application Approved* with *Logged FEMA Aid Size*. To include the significant fraction of applicants who were rejected and received \$0, we add \$1 to every award size before logging. Table App.5 presents similar models using alternative specifications of the *Logged FEMA Aid* term.

The results in Table App.4 confirm that larger award sizes indeed produce turnout effects of significantly greater magnitude. For Democrats (Model 1), receiving an average-sized award of \$682 causes a 1.5% decrease in turnout probability for a previous non-voter. By contrast, Model (2) estimates that for Republicans, the same award size causes a 1.3% increase in turnout probability.

How substantively large are these turnout effects of FEMA aid? In the most extreme case, we estimated earlier that FEMA awards delivered one week prior to the election causes a 5.1% increase in the probability of Republican turnout. This estimate implies that \$13,373 of FEMA aid produces one new Republican voter, an estimate that is nearly identical to Levitt and Snyder's (1997) calculation that \$14,000 of federal spending generates one additional vote for an incumbent legislator. But for FEMA aid delivered temporally further away from the election, we find the turnout effect is much smaller: \$32,476 of aid increases Republican turnout by one. Hence, although delivering FEMA aid produces statistically significant effects on Republican and Democratic turnout, disaster aid is likely not the most impactful type of federal spending when compared to the many types of federal spending in the Levitt and Snyder (1997) data.

Empirical Concerns and Robustness Checks

We now discuss eight possible empirical concerns with our main findings, and we present a series of a series of robustness checks to address each of these concerns.

1. Causal Identification and Placebo Tests. We first address the concern of establishing the causal direction of the empirical relationship between FEMA aid and increased turnout in November 2004. Two potential alternative explanations for the main findings in Table 1 are reverse causality, whereby increased turnout from 2002 to 2004 causes FEMA aid receipt, or an omitted variable that simultaneously causes FEMA aid receipt and increased turnout from 2002 to 2004.

To test for these alternative causal explanations, we present several placebo tests that take advantage of the temporal distribution of FEMA aid applications. FEMA continued to accept aid applications through the end of the 2004 calendar year, and although the majority of hurricane victims applied for aid before November, 40,656 registered Democrats and Republicans in our data did not apply until after the November general election.

The placebo test therefore examines whether FEMA aid that was awarded *after* the November election affects election-day turnout. Election turnout and post-election FEMA aid should be correlated only if reverse causality or an omitted variable is driving the main Table 1 results. Our placebo tests re-estimate the *Eq. 1* model using only the 40,656 registered voters who applied for aid during 2004 but after the November election.

[TABLE 2 ABOUT HERE]

The placebo test results appear in Table 2. The six logit models estimated in Table 3 are identical to the six models reported in Table 1, except that the data include only post-election applicants. Each of the six placebo tests in Table 2 finds no statistically significant effect of post-election FEMA aid on election day turnout. In contrast to the Table 1 results, Republicans who would later receive FEMA aid after the election did not exhibit higher turnout than non-recipients.

Nor was there a significant turnout effect for Democrats who would subsequently receive FEMA aid. The magnitudes of the *Application Approved_i* coefficients estimated in our placebo tests are also much smaller than in the Table 1 results and statistically indistinguishable from zero. Thus, the placebo tests fail to find evidence of reverse causality in the main tests of *Eq. 1*.

2. Does Previous Turnout Affect FEMA Program Participation? A second concern is whether individuals self-select into applying for FEMA aid based on their previous turnout behavior. Such self-selection is plausible, given that civic skills, as described by Verba, Scholzman, and Brady (1995), may explain both turnout and applying for aid. If such self-selection occurs, then the population that applied for aid is not perfectly comparable to those who did not apply for aid, thus potentially limiting the external validity of our findings.

To test for and correct such self-selection bias, we employ a Heckman selection model in Table 3. The selection model requires us to compare individuals who selected into applying for FEMA aid against those who were eligible but did not apply. To estimate this selection model, we use Florida voter registration lists to identify all Florida residents who: 1) were registered and eligible to vote in both November 2002 and 2004; and 2) were registered as either a Democrat or Republican. These two criteria produce a full set of 3,571,284 individuals, representing the universe of previously registered voters who were eligible to apply for FEMA aid in Florida. As previously noted, only 268,752 (7.5%) of these individuals actually applied for prior to the November election.

[TABLE 3 ABOUT HERE]

We estimate and present the Heckman selection model as follows. The right column of Table 3 presents the selection model, which estimates self-selection into applying for FEMA aid among the full set of 3.57 million eligible residents. The middle column of Table 3 presents the Heckman probit outcome model, which predicts November 2004 turnout for the 268,752 residents who applied for FEMA aid. This outcome model is identical in setup to *Eq. 1*, except that the

parameters of the Heckman outcome model and the selection model are jointly estimated via maximum likelihood. Finally, for comparison purposes, the left column of Table 3 presents a standard, uncorrected probit model estimating *Eq. 1*.

The Heckman model in Table 3 reveals three findings. First, the selection model in the right column finds that previous 2002 voters are indeed more likely to apply for FEMA aid than non-voters, even after accounting for hurricane wind speeds and various demographics. Second, this self-selection indeed affects the corrected outcome model, and the model results allow us to reject the null hypothesis that the outcome equation and selection equation are independent. But third, the estimated effects of FEMA aid on turnout in the corrected Heckman outcome model remain statistically significant and in the same directions as in our main results. Substantively, the estimated turnout effects are only slightly smaller in magnitude than in the standard uncorrected probit model in the left column of Table 3. Hence, the Heckman estimates reveal that self-selection indeed affects the composition of applicants in our data, but after correcting for selection bias, our main results regarding increased Republican turnout and decreased Democratic turnout still hold.

3. *Effect of Previous Turnout on FEMA Application Approval.* A third and related concern is whether turnout in the previous election is related to FEMA application approval. Since V.O. Key (1949), political scientists have suggested that voters who exhibit higher turnout rates may receive favorable treatment from the government. For example, Aldrich and Crook (2008) find that undesirable FEMA trailer parks are targeted towards neighborhoods with lower voter turnout. If FEMA treats previous voters and nonvoters differently, then approved FEMA applicants may be dissimilar in political activeness to rejected applicants in our data, thus biasing our main results.

[TABLE 4 ABOUT HERE]

The bottom portion of Table 4 compares FEMA approval rates for November 2002 voters and non-voters. Previous non-voters had their applications approved at a slightly higher rate than

previous voters. The likely explanation for this finding is that previous voters applied for FEMA aid more aggressively, even after controlling for wind speeds, as illustrated by the estimated Heckman selection model in Table 3. Consequently, these previous voters were more likely to be rejected, as these aggressive applications were less likely to have been justified by severe hurricane winds.

To account for this issue, we analyze the main *Eq. 1* model separately for previous voters and non-voters, as these two groups represent different self-selected samples of voters. These separate models appear in the upper portion of Table 4. Although the findings are consistent with the main empirical results of this manuscript, Table 4 also isolates the source of the results by demonstrating that FEMA aid primarily affects the turnout behavior of previous non-voters, rather than previous voters. For Republicans, receiving FEMA aid causes an estimated 1.8% increase in the November 2004 turnout of previous non-voters (Model 5), but only a 0.7% increase in the turnout of previous voters (Model 2). Analogously, for Democrats, receiving FEMA aid causes an estimated 1.1% decrease in the turnout of previous non-voters (Model 4), but only a statistically insignificant decrease in the turnout of previous voters (Model 1). Hence, we find that previous turnout indeed affects the magnitude, though not the direction, of voters' November 2004 responses to FEMA aid: Overall, previous non-voters exhibit the larger turnout effects from FEMA aid.

4. *Partisan Differences in Hurricane Victimization.* A fourth empirical concern is whether the Democratic FEMA applicants in our data are comparable to the Republican applicants with respect to hurricane victimization. We first note that Republican voters in Florida were slightly more likely to be victimized by hurricanes than Democrats. Figure App.3 of the Online Appendix details this pattern by plotting the distribution of maximum wind speeds experienced by the individual voters of each party. This Figure reveals that at the areas with the strongest hurricane winds of over 65 miles per hour, victims were more likely to be Republicans than Democrats.

To address this confounding factor, we examine whether the main findings hold when

comparing Democratic and Republican applicants who experienced identical hurricane severity. To make such comparisons, Figure 1 sorts FEMA applicants into six groups, based on the hurricane wind severity observed at the applicants' respective residences. The left plot displays Democratic FEMA applicants who abstained in November 2002, while the right plot contains Republican applicants who abstained in 2002. Within each plot and for each of the six groups, we compare the November 2004 turnout rate of FEMA aid awardees against the turnout rate of rejected applicants. This difference in turnout rate thus reflects the effect of FEMA aid on turnout within each group.

[FIGURE 1 ABOUT HERE]

Figure 1 reveals that the main turnout findings for Republicans and Democrats hold within each of the six levels of hurricane severity. Within each of the six groups, Democrats who received aid exhibited lower turnout rates than Democrats who were denied aid. And within each group, Republicans awardees exhibited higher turnout rates than rejected Republican applicants. Hence, our results hold when comparing Republicans and Democrats with similar hurricane victimization.

5. *Partisan Bias in the Awarding of FEMA Aid.* A fifth empirical issue we explore is the possibility that FEMA distributed disaster aid in a politically biased fashion. This concern is important because if partisan bias occurs, then such biased treatment by FEMA could possibly elicit either positive or negative reactions by voters, thus affecting their turnout.

Indeed, Table 4 suggests the possibility of such partisan bias by illustrating that Republican applicants (53.7%) were awarded aid at a slightly higher rate than Democratic applicants (50.2%). But the higher approval rate for Republicans also reflects the fact that Republicans were victimized by hurricanes more severely. To examine more carefully whether FEMA exhibited bias, we consider how FEMA treated applicants of each party after controlling for two important predictors of disaster aid eligibility: 1) the hurricane severity at the applicant's home; and 2) the applicant's income. Higher-income individuals are more likely to carry flood insurance, thus disqualifying

them from receiving FEMA aid for damages to insured property.

[FIGURE 2 ABOUT HERE]

To control for these two factors, Figure 2 compares the average FEMA aid awarded to Republican and Democratic applicants within each of three income categories and within each of six categories of hurricane wind severity. In Figure 2, average Republican aid awards are depicted in red triangles, while Democrats are in blue circles. Overall, this Figure illustrates that within each income group and at each level of hurricane severity, Democratic and Republican applicants are treated similarly by FEMA, with no systematic pattern of Republican favoritism. In fact, the most notable partisan disparity occurs within the lowest income group, where Democrats receive slightly larger aid awards, though the magnitude of these differences is relatively small. In sum, after considering applicants' hurricane severity and household income, there is no strong evidence that FEMA engaged in individual-level targeting of Republican applicants in its distribution of aid. As a further illustration of this lack of Republican targeting, Figure App.4 of the Online Appendix presents additional plots that sort applicants by their estimated home values, illustrating FEMA's similar treatment of Democratic and Republican applicants within each level of home values.

6. Partisan Differences in Efficacy of FEMA Experiences. A sixth and related potential concern is that even if FEMA awarded aid equitably to Democrats and Republicans, Democratic applicants could still have been treated less efficiently by FEMA's inspectors. This potential concern is important to explore because previous literature on social programs has found that inefficacious program administration can cause political discouragement among clients. For example, Soss (1999) and Mettler and Stonecash (2008) find that poor beneficiaries of some means-tested programs, including AFDC and food stamps, exhibit lower political participation because of the stigmatizing, inefficacious, and unresponsive administration of such programs.

To explore whether FEMA treated Democratic applicants more inefficaciously than

Republicans, we count the number of days that elapsed from the initial filing of each application until FEMA's inspection and final disposition of the application. While most applicants waited no more than one week for an inspection, some applicants in areas with especially severe hurricane damage waited up to several weeks for FEMA to respond.

Using this data, we first find that Democrats were not treated more slowly than Republicans. Figure App.5 of the Online Appendix illustrates this pattern in greater detail, showing the average wait term endured by Democratic and Republican applicants sorted by the hurricane wind severity at their respective homes. In fact, for applicants living in areas of moderate hurricane damage (45 to 85 mile-per-hour winds), Republican applicants actually waited slightly longer than Democrats for FEMA to respond, though these differences are not large.

Next, having found that Democratic applications were not processed less efficaciously, we examine whether applicants' waiting times affected their November 2004 turnout. Table App.6 of the Online Appendix re-estimates all of the main Table 1 models while controlling for each applicant's *Waiting Time for FEMA Response*. The *Waiting Time* variable is never a significant predictor of turnout, and its inclusion in these models does not alter the main finding that FEMA aid decreases turnout among Democrats and increases turnout among Republicans.

7. Spatial Autocorrelation. A sixth potential concern is that our main turnout results in Table 1 may be largely driven by voters in only one or a small number of localized areas within Florida. To explore this possibility, we conduct two robustness checks.

First, we test for spatial autocorrelation in the residuals of the main Table 1 turnout models. Specifically, we calculate the residuals from Model 4 of Table 1, which predicts FEMA aid's effect on Democratic turnout. We geocode the residuals using each voter's residential address and display a map of these residuals in Figure App.6 of the Online Appendix, with colors ranging from orange to blue representing the most negative to most positive residuals, respectively. Figure App.6 also

presents details of a Global Moran's Index test for spatial autocorrelation. Similarly, Figure App.7 presents an analogous map and Moran's I calculations for the residuals of Model 5 of Table 1, which predicts FEMA aid's effect on Republican turnout. Together, these tests find no significant evidence of spatial autocorrelation in the residuals for either Democratic or Republican voters.

Second, we re-estimate our main turnout model, *Eq. 1*, with standard errors clustered by county. In the Online Appendix, Table App.2 re-estimates each of the full models from Table 1 using clustered standard errors. While these clustered standard errors are slightly larger than the non-clustered results estimated in Table 1, the re-estimated effects of FEMA aid on turnout remain statistically significant and in the same directions as before.

8. Republican Awardees' Motivation for Increased Turnout. A final empirical issue concerns the motivation of Republican FEMA recipients for increasing their turnout. We consider the possibility that Republican awardees increase their turnout not because FEMA aid enhances their esteem for the incumbent President, but instead, because of their dissatisfaction with the FEMA aid process. If Republican awardees were generally dissatisfied with their experiences with the FEMA administration, then we would expect precincts receiving more FEMA aid awards to exhibit more electoral opposition to President Bush, even in Republican-leaning precincts.

Our test of this possible alternative explanation also represents a direct test of Hypothesis 2, which predicts that by causing increased Republican turnout and decreased Democratic turnout, FEMA aid should thereby cause an increase in President Bush's November 2004 vote share. This Hypothesis logically holds only if the Republican FEMA recipients who increased their turnout rate actually vote for President Bush. To test this prediction, we estimate the precinct-level relationship between FEMA aid and increased Bush vote share in November 2004, relative to November 2000. Hence, our data include only precincts that were geographically comparable across the 2000, 2002, and 2004 elections and that have provided Presidential vote counts for all three elections. 5,897

(89%) of Florida's 6,616 precincts satisfy these criteria and are included.

To test *Hypothesis 2*, we regress President Bush's 2004 precinct-level vote share onto the amount of FEMA aid each precinct's residents collectively received. We also control for precinct-level vote shares in the 2000 Presidential election and the 2002 Gubernatorial election, which the President's brother, Republican Jeb Bush, won by a margin of 56% to 43%. The full model is:

$$Bush04_i = \alpha + \beta_{B00} \cdot Bush00_i + \beta_{B02} \cdot Bush02_i + \beta_F \cdot FEMA Aid_i + \gamma \cdot \mathbf{x}_i + \varepsilon_i, \quad (2)$$

where $Bush04_i$, $Bush00_i$, and $Bush02_i$ are George Bush's (November 2004 and November 2000) and Jeb Bush's (November 2002) vote shares, respectively, of the two-party vote in precinct i .

$FEMA Aid_i$ is measured as $\log(Dollars_i + 1)$, where $Dollars_i$ is the number of FEMA aid dollars per capita that residents of precinct i received during 2004 prior to Election Day. Finally, \mathbf{x}_i represents a vector of the following control variables: The highest *Hurricane Wind Speed* measured in precinct i during each of the four hurricanes, the precinct's *Median Household Income*, the amount of *Welfare Per Capita* received by the precinct, the *African-American Proportion*, and the proportion of the precinct's residents that are *Homeowners*. Finally, the full model includes county fixed effects. We weight all observations in our least-squares estimates of *Eq. 2* by voting-age population.

[TABLE 5 ABOUT HERE]

Table 5 reports estimates of *Eq. 2* using the full model (Model 3), without the control variables (Model 2), and without the *Hurricane Wind Speed* measurements (Model 1). Models 4 and 5 also estimate *Eq. 2* separately for Democratic-leaning (Model 1) and Republican-leaning (Model 2) precincts; Democratic-leaning precincts are those which supported Al Gore over George Bush in November 2000, and Republican-leaning precincts are those with more Bush voters. Collectively, the results in Table 5 corroborate the theoretical prediction of *Hypothesis 2*: In both Republican and Democratic areas, the increase in Republican turnout and the decrease in

Democratic turnout caused by FEMA aid both appear to positively affect Bush's vote share. In Republican-leaning precincts (Model 5), a \$100 per capita increase in FEMA aid causes a 1.0% increase in Bush's 2004 vote share; this estimate has a 95% confidence interval of +0.9% to +1.1%. In Democratic-leaning precincts (Model 4), a \$100 per capita increase in aid causes a 0.5% increase in Bush's 2004 vote share, with a confidence interval of +0.4% to +0.6%.

The Online Appendix presents two further robustness checks of these basic tests of Hypothesis 2. First, Table App.7 re-estimates all of the Table 5 models using clustered standard errors; although the estimated clustered standard errors are larger, the overall effects of FEMA aid on Bush vote share remain statistically significant. Second, Figure App.8 presents plots of the precinct-level data to graphically illustrate the relationship between FEMA aid and Bush vote share. In each plot in this Figure, the vertical axis measures each precinct's residual Bush vote share when George Bush's (2004) precinct-level vote share is regressed onto its 2000 and 2002 Bush vote shares. In other words, the residual vote share measures each precinct's *unexpected* support for President Bush in 2004, given the precinct's past pre-hurricane history of Republican voting. The horizontal axis in each plot measures the amount of FEMA aid per capita received by the residents of each precinct. The dashed line in each plot represents the population-weighted least squares fit within each plot, illustrating the positive relationship between FEMA aid and Bush vote share.

Discussion

This paper makes three contributions to the existing literature on distributive spending and political participation. First, we show that one important effect of government spending is the suppression of voter participation among opposition party constituents while simultaneously mobilizing core constituents. Most empirical studies of distributive politics have focused on the effect of government benefits on mobilizing core voter turnout (eg, Cox and Kousser 1981; Nicther

2007) or swaying moderate voters (eg, Dixit and Londregan 1996; 1998; Stokes 2005).

Our paper contributes to this literature by empirically demonstrating that in addition to the core and swing voter effects, distributive benefits may also enhance the incumbent party's electoral prospects by suppressing the opposing party's voter turnout. Previously, formal models by Heckelman (1998), Morgan and Vardy (2006), and Gans-Morse, Mazzuca, and Nichter (2009) have suggested the possibility of "negative turnout buying" or "buying abstention," whereby a party explicitly bribes opposition voters to abstain from voting. Anecdotally, Cox and Kousser (1981), Argersinger (1987), and Schaffer (2002), described historical instances in which parties may have engaged in "negative turnout buying" strategies. While the electoral impacts of FEMA aid certainly do not qualify as "negative turnout buying," they nevertheless describe a related situation in which distributive benefits persuade opposition voters to freely abstain from participating in an election. Our paper is the first to provide systematic, individual-level statistical evidence that a party's delivery of distributive benefits can decrease the turnout of the opposition party's voters.

Second, our findings contribute nuance to a literature that explores how welfare spending affects political participation. Radcliff (1992) speculates that welfare programs may help to explain why voter turnout is less sensitive to economic conditions in industrialized nations than in developing countries (446). Examining incumbent vote shares across industrialized countries, Pacek and Radcliff (1995) find that large welfare states may protect incumbent politicians from being punished during economic busts (53), and the authors suggest that variable turnout among the poor may be an important mechanism for this result (59). Singer (2011) presents similar findings for incumbent vote shares in US state legislative elections.

Building upon these previous hypothesized accounts, this paper produces empirical evidence to document the individual-level effect of distributive benefits on turnout. And in doing so, we show that the effect is not a simple, uniform one. On one hand, our finding that the delivery

of benefits generally increases the incumbent's vote share simply corroborates past literature. But we explain and empirically document the partisan-specific turnout mechanisms that produce this result. We thus show that the turnout effect produced by receiving state spending can either be positive or negative, depending on whether or not the voter identifies with the incumbent's party.

Finally, our theory explains, and our empirical results illustrate, why a non-partisan distributive program can cause such partisan disparity in political participation. In studies of developing democracies and political machines, a discussion of swing voter (eg, Dixit and Londregan 1996; 1998; and Stokes 2005) and core voter models (eg, Cox and McCubbins 1986; Nichter 2007) can safely presume that a political party often has the option of targeting distributive benefits to a chosen constituency primarily on the basis of partisan or ideological loyalties.

But a distinguishing feature of developed democracies is that norms of government transparency and accountability effectively preclude parties from engaging in extreme targeting of public spending. Indeed, we test for and find no evidence that FEMA favored Republican aid applicants over Democrats at the individual level in our data. Hence, our theory assumes that a right-wing president cannot target aid to Republicans and discriminate against Democrats.

Why does this non-partisan nature of FEMA aid cause a partisan disparity in turnout effects? As disaster aid cannot be targeted to Republicans, a right-wing incumbent who provides pre-election disaster relief can therefore credibly develop a reputation among all voters for prioritizing disaster aid. This enhanced reputation mitigates a left-wing voter's ideological opposition to the incumbent while augmenting the right-wing voter's ideological preference for the incumbent. Consequently, the left-wing aid recipient has less motivation to vote and expel the incumbent, while the right-wing recipient has increased motivation to vote and re-elect the incumbent. Hence, these dynamics produce the counter-intuitive result that a non-partisan FEMA aid program actually causes disparate partisan effects on turnout for Republicans and Democrats.

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Table 1: Effect of FEMA Application Approval on Voter Turnout Among FEMA Applicants

<i>Dependent Variable: Voted in November 2004 Election</i>						
<i>Voters Included:</i>	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	Democrats	Republicans	Democrats and Republicans	Democrats	Republicans	Democrats and Republicans
FEMA Application Approved	-0.036** (0.013)	0.084*** (0.016)	-0.035** (0.013)	-0.039** (0.014)	0.054*** (0.016)	-0.041** (0.014)
FEMA Application Approved × Registered Republican	----	----	0.118*** (0.020)	----	----	0.100*** (0.021)
Registered Republican	----	----	0.141*** (0.015)	----	----	0.080*** (0.016)
Voted in November 2002 General Election	2.358*** (0.014)	2.416*** (0.016)	2.384*** (0.011)	2.343*** (0.015)	2.347*** (0.017)	2.352*** (0.011)
Maximum Wind Speed (Miles Per Hour)	----	----	----	0.000 (0.005)	-0.011* (0.005)	-0.005 (0.003)
Maximum Wind Speed (Miles Per Hour Squared)	----	----	----	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Voter's Age (Years)	----	----	----	0.071*** (0.002)	0.081*** (0.003)	0.075*** (0.002)
Voter's Age (Years Squared)	----	----	----	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Med. Home Value in Block Group (\$1,000s)	----	----	----	0.009*** (0.002)	0.010*** (0.002)	0.010*** (0.002)
Voter's Gender (Male)	----	----	----	-0.276*** (0.014)	-0.162*** (0.016)	-0.226*** (0.010)
African-American	----	----	----	-0.011 (0.018)	-0.474*** (0.051)	-0.027 (0.016)
Med. Household Income in Block Group (\$1,000s)	----	----	----	0.081*** (0.008)	0.092*** (0.009)	0.081*** (0.006)
County Fixed Effects	----	----	----	Included	Included	Included
Constant	-0.088*** (0.011)	0.032* (0.013)	-0.097*** (0.010)	-1.689*** (0.182)	-1.534*** (0.229)	-1.633*** (0.140)
<i>Pseudo R</i> ²	0.30	0.30	0.30	0.34	0.33	0.34
<i>N</i>	142,637	126,115	268,752	142,637	126,115	268,752

****p*<.001; ***p*<.01; **p*<.05 (two-tailed). Standard errors in parentheses.

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election and who were registered to vote in both the 2002 and 2004 elections.

Table 2: Placebo Test of Residents who Applied for FEMA Aid After November 2004

		<i>Dependent Variable: Voted in November 2004 Election</i>					
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
<i>Voters Included:</i>		Democrats	Republicans	Democrats and Republicans	Democrats	Republicans	Democrats and Republicans
FEMA Application Approved (Post-November 2004)		-0.011 (0.034)	-0.006 (0.040)	-0.011 (0.034)	0.017 (0.036)	-0.012 (0.041)	0.016 (0.035)
FEMA Application Approved (Post-November 2004) × Registered Republican		----	----	0.005 (0.053)	----	----	-0.020 (0.054)
Registered Republican		----	----	0.179*** (0.040)	----	----	0.139** (0.043)
Voted in November 2002 General Election		2.301*** (0.036)	2.315*** (0.041)	2.307*** (0.027)	2.291*** (0.039)	2.234*** (0.044)	2.269*** (0.029)
Maximum Wind Speed (Miles Per Hour)		----	----	----	0.003 (0.014)	-0.006 (0.016)	-0.000 (0.010)
Maximum Wind Speed (Miles Per Hour Squared)		----	----	----	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Voter's Age (Years)		----	----	----	0.071*** (0.006)	0.074*** (0.007)	0.071*** (0.004)
Voter's Age (Years Squared)		----	----	----	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Med. Home Value in Block Group (\$1,000s)		----	----	----	0.008 (0.006)	0.005 (0.005)	0.006 (0.004)
Voter's Gender (Male)		----	----	----	-0.260*** (0.036)	-0.146*** (0.040)	-0.207*** (0.027)
African-American		----	----	----	-0.034 (0.044)	-0.397*** (0.117)	-0.066 (0.040)
Med. Household Income in Block Group (\$1,000s)		----	----	----	0.091*** (0.019)	0.088*** (0.021)	0.087*** (0.014)
County Fixed Effects		----	----	----	Included	Included	Included
Constant		-0.077** (0.029)	0.097** (0.034)	-0.079** (0.027)	-1.671** (0.515)	-1.328* (0.607)	-1.558*** (0.388)
	<i>Pseudo R</i> ²	0.29	0.28	0.29	0.33	0.32	0.32
	<i>N</i>	21,864	18,792	40,656	21,864	18,792	40,656

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Data include registered voters whose household applied for FEMA disaster aid after the November 2004 election and who were registered to vote in both the 2002 and 2004 elections.

Table 3: Heckman Censored Probit Model

<i>Dependent Variable:</i>	<i>Voters Included: Democrats and Republicans</i>		
	Standard Probit Model:	Heckman Outcome Model:	Selection Model:
	Voted in November 2004	Voted in November 2004	Applied for FEMA Aid
FEMA Application Approved	-0.020* (0.008)	-0.019* (0.008)	----
FEMA Application Approved × Registered Republican	0.068*** (0.012)	0.068*** (0.012)	----
Registered Republican	0.082*** (0.008)	0.083*** (0.008)	0.009*** (0.002)
Voted in November 2002 General Election	1.379*** (0.006)	1.378*** (0.006)	0.030*** (0.002)
Median Household Income of Block Group (\$100,000s)	----	----	0.028* (0.009)
Median Home Value in Block Group (\$100,000s)	----	----	-0.230*** (0.003)
Male Gender	----	----	-0.008*** (0.002)
African-American	----	----	0.073*** (0.003)
Maximum Wind Speed (Miles Per Hour)	----	----	0.034*** (0.000)
Maximum Wind Speed (Miles Per Hour), Squared	----	----	-0.000*** (0.000)
Voter's Age (Years)	----	----	0.020*** (0.000)
Voter's Age (Years Squared)	----	----	-0.000*** (0.000)
Constant	-0.058*** (0.006)	-0.119*** (0.015)	-3.373*** (0.015)
			0.036 (0.008)
	<i>N</i>	268,752	268,752
			3,571,284

***p<.001; **p<.01; *p<.05 (two-tailed). Standard errors in parentheses.

Note: The full data include all Democrats and Republicans who were registered to vote in both the 2002 and 2004 elections. The selection model predicts which of these registrants self-select into applying for FEMA aid prior to the November 2004 election.

Table 4: Effect of FEMA Application Approval on Voter Turnout Among Previous Voters and Previous Non-Voters

		<i>Dependent Variable: Voted in November 2004 Election</i>					
		November 2002 Voters whose party affiliation is...			November 2002 Non-Voters whose party affiliation is...		
<i>Voters Included:</i>		Democrat	Republican	Democrat or Republican	Democrat	Republican	Democrat or Republican
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
FEMA Application Approved		-0.017 (0.024)	0.101*** (0.026)	-0.017 (0.024)	-0.044** (0.016)	0.074*** (0.019)	-0.044** (0.016)
FEMA Application Approved × Registered Republican		----	----	0.118*** (0.036)	----	----	0.118*** (0.025)
Registered Republican		----	----	0.179*** (0.025)	----	----	0.122*** (0.018)
Constant		2.260*** (0.017)	2.439*** (0.019)	2.260*** (0.017)	-0.084*** (0.012)	0.038** (0.014)	-0.084*** (0.012)
	<i>Pseudo R</i> ²	0.30	0.30	0.30	0.30	0.30	0.30
	<i>N</i>	81,148	82,427	163,575	61,489	43,688	105,177
	<i>Total Applicants:</i>	81,148	82,427	163,575	61,489	43,688	105,177
	<i>Applicants Awarded Aid:</i>	39,583	44,104	83,687	32,006	23,723	55,729
	<i>Approval Rate:</i>	48.8%	53.5%	51.2%	52.1%	54.3%	54.0%

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election and who were registered to vote in both the 2002 and 2004 elections.

Table 5: WLS Regression: The Effect of FEMA Aid on Precinct-Level Bush Vote Share

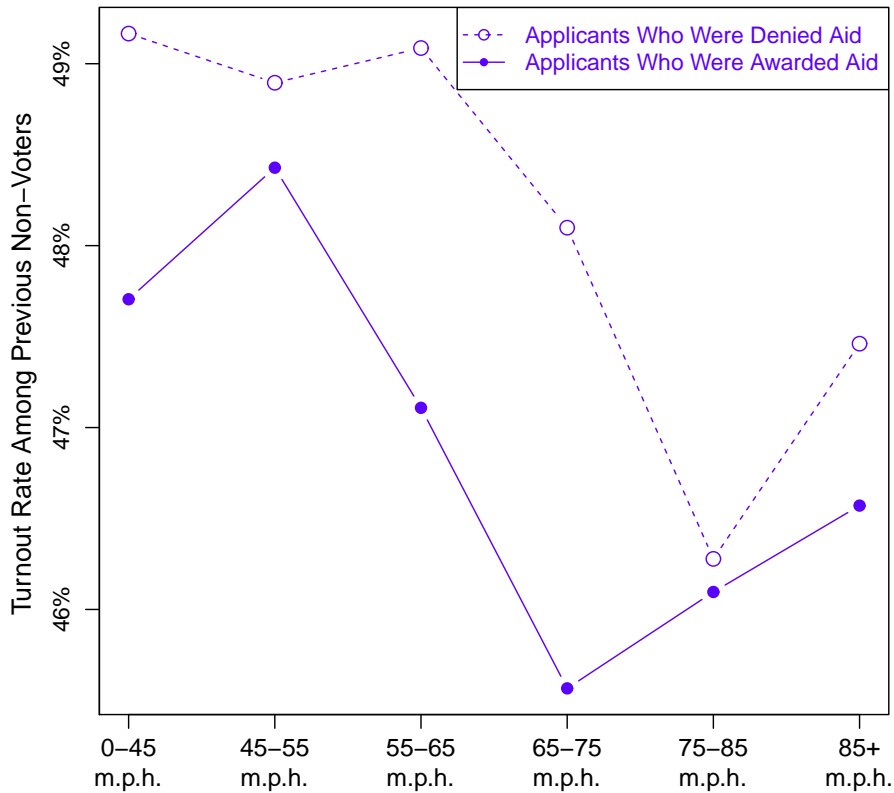
	<i>Dependent Variable: 2004 George Bush Vote Share ×100</i>					
	Model (1)	Model (2)	Model (3)	Model (4)	Model (4)	
Precincts Included:	All Precincts	All Precincts	All Precincts	Democratic Precincts (< 50% Bush Vote)	Republican Precincts (> 50% Bush Vote)	
Proposition 2:						
FEMA Aid (Dollars Per Capita, Logged)	0.36*** (0.04)	0.78*** (0.04)	1.03*** (0.04)	0.58*** (0.07)	1.25*** (0.06)	
2000 G.W. Bush Vote Share	33.65*** (1.02)	26.16*** (1.03)	27.26*** (0.93)	17.49*** (1.34)	33.28*** (1.65)	
2002 Jeb Bush Vote Share	60.19*** (1.03)	66.50*** (1.03)	57.12*** (1.07)	61.58*** (1.39)	52.55*** (1.69)	
Median Household Income (\$10,000s)	----	----	0.50*** (0.04)	0.66*** (0.06)	0.29*** (0.06)	
Welfare Receipts (\$1,000s) Per Capita	----	----	-11.97*** (2.06)	-7.80*** (2.68)	-14.13*** (3.16)	
African-American Proportion	----	----	-4.88*** (0.46)	-5.12*** (0.60)	-7.09*** (1.20)	
Homeowner Proportion	----	----	5.50*** (0.33)	3.87*** (0.41)	6.88*** (0.54)	
Hurricane Wind Speeds Included	No	Yes	Yes	Yes	Yes	
Constant	0.77*** (0.0.23)	6.28*** (0.49)	7.16*** (0.62)	7.64*** (0.99)	7.45*** (1.03)	
	R^2	0.93	0.93	0.94	0.93	0.80
	N	5,897	5,897	5,897	2,866	3,031

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Observations are weighted by precinct voting-age population. Democratic (Republican) precincts are those in which George Bush's share of the two-party vote in November 2000 was under (at least) 50%.

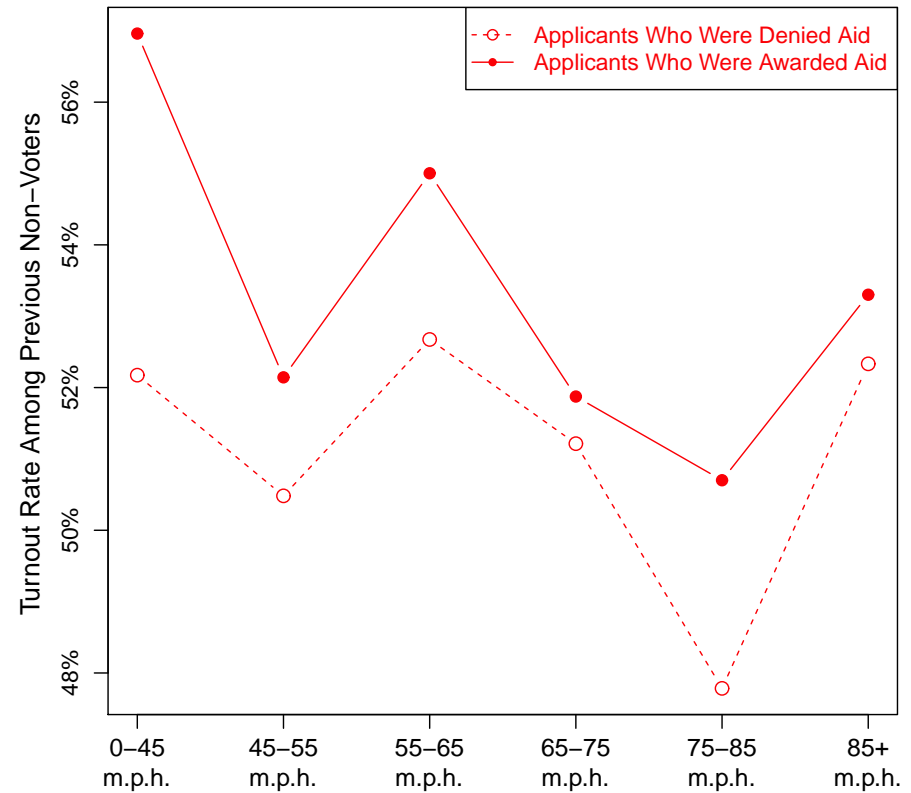
Figure 1: Turnout Rate Among FEMA Aid Recipients and Rejected Applicants

Among Democrats, Aid Recipients Exhibit Lower Turnout



Maximum Hurricane Wind Speed (Miles Per Hour) at Voter's Residence

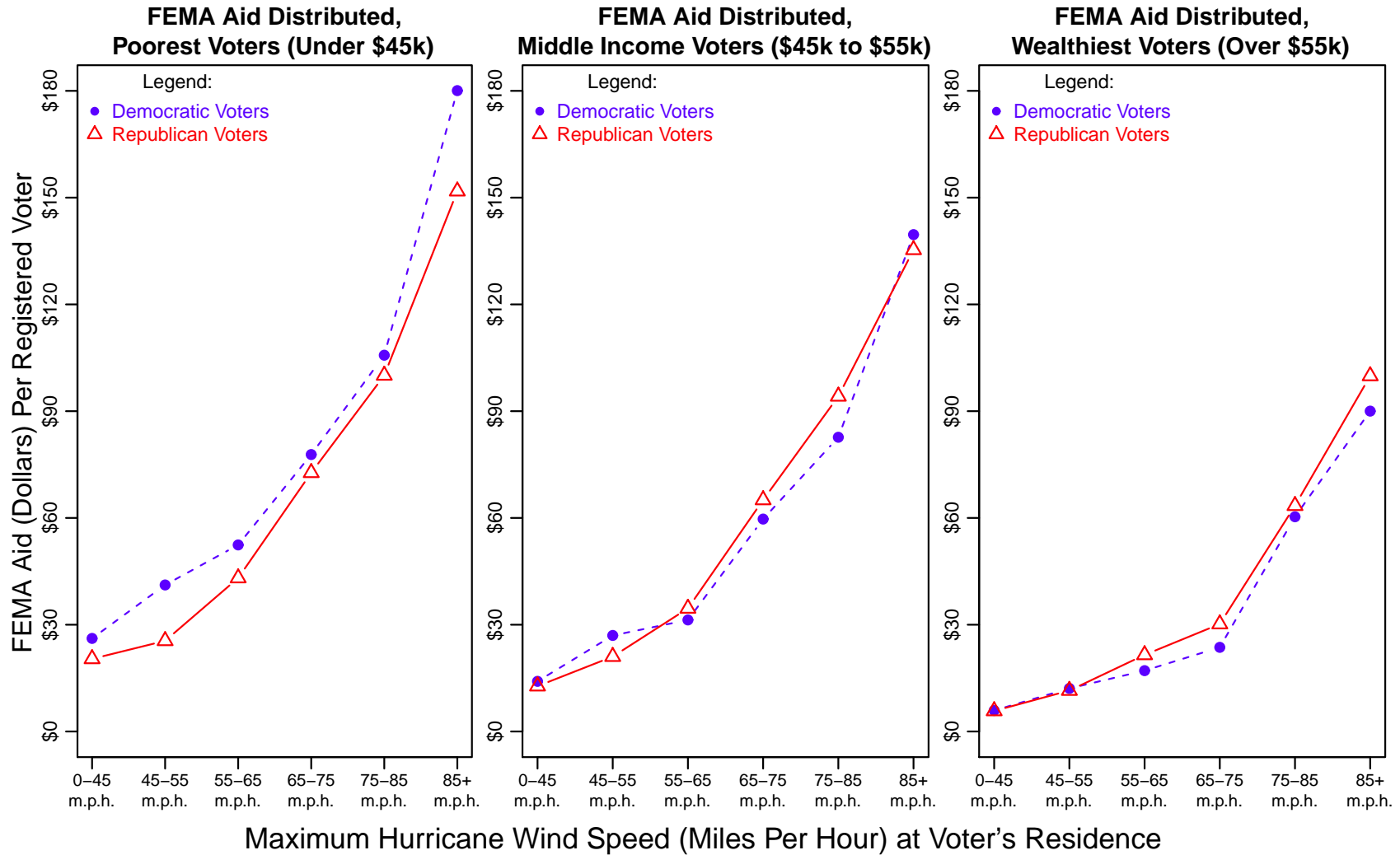
Among Republicans, Aid Recipients Exhibit Higher Turnout



Maximum Hurricane Wind Speed (Miles Per Hour) at Voter's Residence

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election, who were registered to vote in both the 2002 and 2004 elections, and who were either registered Democrats (left plot) or Republicans (right plot) as of the November 2004 election.

Figure 2: The Awarding of FEMA Aid by Party, by Income Group, and by Hurricane Severity



Note: Data include all individuals who were registered to vote in both the 2002 and 2004 elections, and who were either registered Democrats (blue circles) or Republicans (red triangles) as of the November 2004 election.

**Supporting Information (Online Appendix) for:
"Voter Partisanship and the Effect of Distributive Spending on Political Participation."**

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Table App.1: Partisan Composition of FEMA Aid Applicants

Party Affiliation	Number of FEMA Aid Applicants who were Party Affiliates
Democratic Party	142,637 (44.0%)
Republican Party	126,115 (38.9%)
[No Party Affiliation Selected]	36,729 (11.3%)
Independent Party of Florida	7,206 (2.2%)
The No Party Affiliation Party of Florida	1,707 (0.6%)
Libertarian Party of Florida	322 (<0.1%)
Independence Party of Florida	162 (<0.1%)
Reform Party	130 (<0.1%)
The Green Party of Florida, Inc.	110 (<0.1%)
[Other or non-recognized party]	9,201 (2.8%)
Total Applicants with Voter Registrations	324,319 (100%)

Note: This Table reports each party's share of the 2004 Florida FEMA applicants who satisfied the following three criteria: 1) The individual's household applied for FEMA aid during the 2004 hurricane season; 2) FEMA took action on the household's aid application prior to the November 2004 general election; 3) The individual was eligible and actively registered to vote in both the 2002 and 2004 general elections

**Table App.2: Re-estimation of Table 1 Models Using Clustered Standard Errors
Effect of FEMA Application Approval on Voter Turnout Among FEMA Applicants**

<i>Voters Included:</i>	<i>Dependent Variable: Voted in November 2004 Election</i>		
	Democrats	Republicans	Democrats and Republicans
FEMA Application Approved	-0.039* (0.018)	0.054** (0.017)	-0.041* (0.019)
FEMA Application Approved × Registered Republican	----	----	0.100*** (0.028)
Registered Republican	----	----	0.080 (0.045)
Voted in November 2002 General Election	2.343*** (0.115)	2.347*** (0.140)	2.352*** (0.125)
Maximum Wind Speed (Miles Per Hour)	0.000 (0.005)	-0.011 (0.008)	-0.005 (0.006)
Maximum Wind Speed (Miles Per Hour Squared)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Voter's Age (Years)	0.071*** (0.006)	0.081*** (0.008)	0.075*** (0.006)
Voter's Age (Years Squared)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Med. Home Value in Block Group (\$1,000s)	0.009* (0.003)	0.010 (0.006)	0.010* (0.004)
Voter's Gender (Male)	-0.276*** (0.027)	-0.162*** (0.013)	-0.226*** (0.020)
African-American	-0.011 (0.040)	-0.474*** (0.078)	-0.027 (0.040)
Med. Household Income in Block Group (\$1,000s)	0.081*** (0.011)	0.092*** (0.012)	0.081*** (0.008)
County Fixed Effects	Included	Included	Included
Constant	-1.689*** (0.260)	-1.534*** (0.377)	-1.633*** (0.292)
<i>Pseudo R</i> ²	0.34	0.33	0.34
<i>N</i>	142,637	126,115	268,752

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Clustered standard errors in parentheses, where each cluster is a county.

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election and who were registered to vote in both the 2002 and 2004 elections.

Table App.3: Effect of FEMA Aid Delivered One Week Before the November 2004 Election

	<i>Dependent Variable: Voted in November 2004 Election</i>			
	Model (1)	Model (2)	Model (3)	Model (4)
	<i>Voters Included:</i>		Democrats	Republicans
FEMA Application Approved During Aug. 14 to Oct. 27, 2004	-0.030* (0.014)	0.077*** (0.016)	-0.034* (0.014)	0.048** (0.016)
FEMA Application Approved During Oct. 27 to Nov. 2, 2004	-0.125** (0.040)	0.203*** (0.048)	-0.124** (0.041)	0.168*** (0.049)
Voted in November 2002 General Election	2.358*** (0.014)	2.416*** (0.016)	2.343*** (0.015)	2.347*** (0.017)
Maximum Wind Speed (Miles Per Hour)	----	----	0.000 (0.005)	-0.011* (0.005)
Maximum Wind Speed (Miles Per Hour Squared)	----	----	0.000 (0.000)	0.000* (0.000)
Voter's Age (Years)	----	----	0.071*** (0.002)	0.081*** (0.003)
Voter's Age (Years Squared)	----	----	-0.001*** (0.000)	-0.001*** (0.000)
Med. Home Value in Block Group (\$1,000s)	----	----	0.009*** (0.002)	0.010*** (0.002)
Voter's Gender (Male)	----	----	-0.276*** (0.014)	-0.162*** (0.016)
African-American	----	----	-0.011 (0.018)	-0.474*** (0.051)
Med. Household Income in Block Group (\$1,000s)	----	----	0.081*** (0.008)	0.092*** (0.009)
County Fixed Effects	----	----	Included	Included
Constant	-0.088*** (0.011)	0.032* (0.013)	-1.688*** (0.182)	-1.539*** (0.229)
<i>Pseudo R²</i>	0.30	0.30	0.34	0.33
<i>N</i>	142,637	126,115	142,637	126,115

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Data include voters whose household applied for FEMA disaster aid before the November 2004 election, and who were registered to vote in both the 2002 and 2004 elections.

Table App.4: Effect of FEMA Award Size on Voter Turnout Among FEMA Applicants

<i>Voters Included:</i>	<i>Dependent Variable: Voted in November 2004 Election</i>					
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	Democrats	Republicans	Democrats and Republicans	Democrats	Republicans	Democrats and Republicans
$\text{Log}_e(\text{FEMA Aid} + \$1)$	-0.009*** (0.002)	0.008*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	0.005* (0.002)	-0.009*** (0.002)
$\text{Log}_e(\text{FEMA Aid} + \$1) \times$ Registered Republican	----	----	0.017*** (0.003)	----	----	0.014*** (0.003)
Registered Republican	----	----	0.141*** (0.015)	----	----	0.081*** (0.016)
Voted in November 2002 General Election	2.356*** (0.014)	2.416*** (0.016)	2.383*** (0.011)	2.342*** (0.015)	2.348*** (0.017)	2.352*** (0.012)
Maximum Wind Speed (Miles Per Hour)	----	----	----	-0.000 (0.005)	-0.011* (0.005)	-0.005 (0.003)
Maximum Wind Speed (Miles Per Hour Squared)	----	----	----	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Voter's Age (Years)	----	----	----	0.071*** (0.002)	0.082*** (0.003)	0.075*** (0.002)
Voter's Age (Years Squared)	----	----	----	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Med. Home Value in Block Group (\$1,000s)	----	----	----	0.009*** (0.002)	0.010*** (0.002)	0.010*** (0.002)
Voter's Gender (Male)	----	----	----	-0.275*** (0.014)	-0.161*** (0.016)	-0.226*** (0.010)
African-American	----	----	----	-0.012 (0.018)	-0.475*** (0.051)	-0.027 (0.016)
Med. Household Income in Block Group (\$1,000s)	----	----	----	0.080*** (0.008)	0.092*** (0.009)	0.081*** (0.006)
County Fixed Effects	----	----	----	Included	Included	Included
Constant	-0.072*** (0.011)	0.048*** (0.013)	-0.081*** (0.010)	-1.669*** (0.182)	-1.523*** (0.229)	-1.618*** (0.140)
<i>Pseudo R</i> ²	0.30	0.30	0.30	0.34	0.33	0.34
<i>N</i>	142,637	126,115	268,752	142,637	126,115	268,752

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election and who were registered to vote in both the 2002 and 2004 elections. *FEMA Aid* is the number of dollars each applicant's household received. Rejected applicants receive \$0.

Table App.5: Alternative Specifications of Logged FEMA Aid Models

	<i>Dependent Variable: Voted in November 2004 Election</i>								
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
<i>Voters Included:</i>	Democrats	Republicans	Democrats and Republicans	Democrats	Republicans	Democrats and Republicans	Democrats	Republicans	Democrats and Republicans
Log_e (FEMA Aid + \$10)	-0.017*** (0.003)	0.009** (0.003)	-0.017*** (0.003)	----	----	----	----	----	----
Log_e (FEMA Aid + \$10) × Registered Republican	----	----	0.025*** (0.004)	----	----	----	----	----	----
Log_e (FEMA Aid + \$0.1)	----	----	----	-0.006*** (0.001)	0.007*** (0.002)	-0.006*** (0.001)	----	----	----
Log_e (FEMA Aid + \$0.1) × Registered Republican	----	----	----	----	----	0.013*** (0.002)	----	----	----
Log_{10} (FEMA Aid + \$1)	----	----	----	----	----	----	-0.022*** (0.004)	0.018*** (0.005)	-0.022*** (0.004)
Log_{10} (FEMA Aid + \$1) × Registered Republican	----	----	----	----	----	----	----	----	0.040*** (0.007)
Registered Republican	----	----	0.085*** (0.023)	----	----	0.171*** (0.012)	----	----	0.141*** (0.015)
Voted in November 2002 General Election	2.355*** (0.014)	2.416*** (0.016)	2.382*** (0.011)	2.357*** (0.014)	2.416*** (0.016)	2.383*** (0.011)	2.356*** (0.014)	2.416*** (0.016)	2.383*** (0.011)
Constant	-0.027 (0.015)	0.036 (0.019)	-0.036* (0.015)	-0.091*** (0.009)	0.060*** (0.011)	-0.099*** (0.008)	-0.072*** (0.011)	0.048*** (0.013)	-0.081*** (0.010)
<i>Pseudo R</i> ²	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
<i>N</i>	142,637	126,115	268,752	142,637	126,115	268,752	142,637	126,115	268,752

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election and who were registered to vote in both the 2002 and 2004 elections.

Table App.6: Effect of FEMA Responsiveness on Voter Turnout Among Applicants

	<i>Dependent Variable: Voted in November 2004 Election</i>					
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	<i>Voters Included:</i> Democrats	Republicans	Democrats and Republicans	Democrats	Republicans	Democrats and Republicans
FEMA Application Approved	-0.033* (0.014)	0.088*** (0.016)	-0.032* (0.014)	-0.039** (0.014)	0.055*** (0.016)	-0.041** (0.014)
FEMA Application Approved × Registered Republican	----	----	0.118*** (0.020)	----	----	0.100*** (0.021)
Registered Republican	----	----	0.141*** (0.015)	----	----	0.079*** (0.016)
Waiting Time for FEMA Response to Application (Days)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)
Voted in November 2002 General Election	2.358*** (0.014)	2.416*** (0.016)	2.384*** (0.011)	2.343*** (0.015)	2.347*** (0.017)	2.352*** (0.012)
Maximum Wind Speed (Miles Per Hour)	----	----	----	0.000 (0.005)	-0.006 (0.016)	-0.005 (0.003)
Maximum Wind Speed (Miles Per Hour Squared)	----	----	----	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Voter's Age (Years)	----	----	----	0.071*** (0.002)	0.081*** (0.003)	0.075*** (0.002)
Voter's Age (Years Squared)	----	----	----	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Med. Home Value in Block Group (\$1,000s)	----	----	----	0.009*** (0.002)	0.010*** (0.002)	0.010*** (0.002)
Voter's Gender (Male)	----	----	----	-0.276*** (0.014)	-0.162*** (0.016)	-0.226*** (0.010)
African-American	----	----	----	-0.011 (0.018)	-0.474*** (0.051)	-0.027 (0.016)
Med. Household Income in Block Group (\$1,000s)	----	----	----	0.081*** (0.008)	0.092*** (0.009)	0.081*** (0.006)
County Fixed Effects	----	----	----	Included	Included	Included
Constant	-0.087*** (0.011)	0.035** (0.013)	-0.095*** (0.010)	-1.688*** (0.182)	-1.535*** (0.229)	-1.633*** (0.140)
<i>Pseudo R²</i>	0.30	0.30	0.30	0.34	0.33	0.34
<i>N</i>	142,637	126,115	268,752	142,637	126,115	268,752

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Standard errors in parentheses.

Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election and who were registered to vote in both the 2002 and 2004 elections.

Table App.7: Re-estimation of Table 5 Models Using Clustered Standard Errors
WLS Regression: The Effect of FEMA Aid on Precinct-Level Bush Vote Share

	<i>Dependent Variable: 2004 George Bush Vote Share ×100</i>					
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	
	Precincts Included: All Precincts	All Precincts	All Precincts	Democratic Precincts (< 50% Bush Vote)	Republican Precincts (> 50% Bush Vote)	
Proposition 2:						
FEMA Aid (Dollars Per Capita, Logged)	0.36** (0.12)	0.78*** (0.12)	1.03*** (0.09)	0.79*** (0.16)	1.20*** (0.11)	
2000 G.W. Bush Vote Share	33.65*** (4.44)	26.16*** (3.52)	27.26*** (3.34)	20.78*** (2.88)	35.44*** (5.50)	
2002 Jeb Bush Vote Share	60.19*** (4.27)	66.50*** (3.31)	57.12*** (3.54)	55.46*** (3.99)	49.79*** (5.11)	
Median Household Income (\$10,000s)	----	----	0.50*** (0.08)	0.85*** (0.15)	0.14 (0.14)	
Welfare Receipts (\$1,000s) Per Capita	----	----	-11.97*** (3.01)	-3.49 (3.79)	-12.24* (5.79)	
African-American Proportion	----	----	-4.88*** (0.99)	-7.94*** (1.38)	-11.36*** (3.25)	
Homeowner Proportion	----	----	5.50*** (0.68)	2.81*** (0.77)	7.48*** (1.21)	
Hurricane Wind Speeds Included	No	Yes	Yes	Yes	Yes	
Constant	0.78 (0.61)	6.28** (1.92)	7.16*** (2.06)	11.07*** (2.24)	10.48** (3.32)	
	R^2	0.93	0.93	0.94	0.93	0.80
	N	5,897	5,897	5,897	2,866	3,031

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed). Clustered standard errors in parentheses, where each cluster is a State House district, the smallest geographic unit within which precincts lie.

Note: Observations are weighted by precinct voting-age population. Democratic (Republican) precincts are those in which George Bush's share of the two-party vote in November 2000 was under (at least) 50%.

Figure App.1: Distribution of FEMA Aid Across Individuals

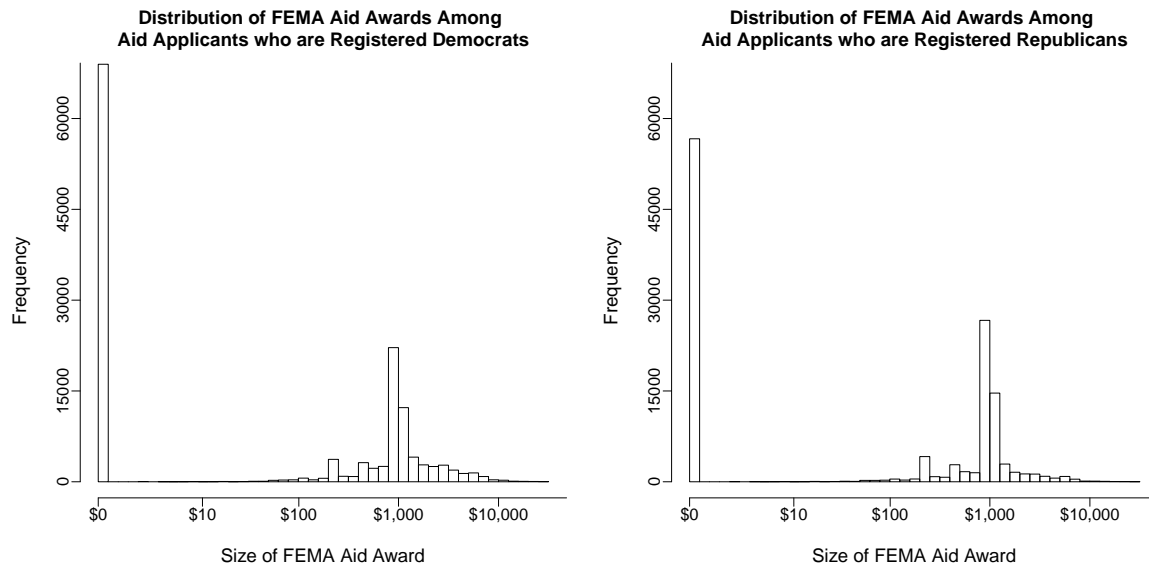
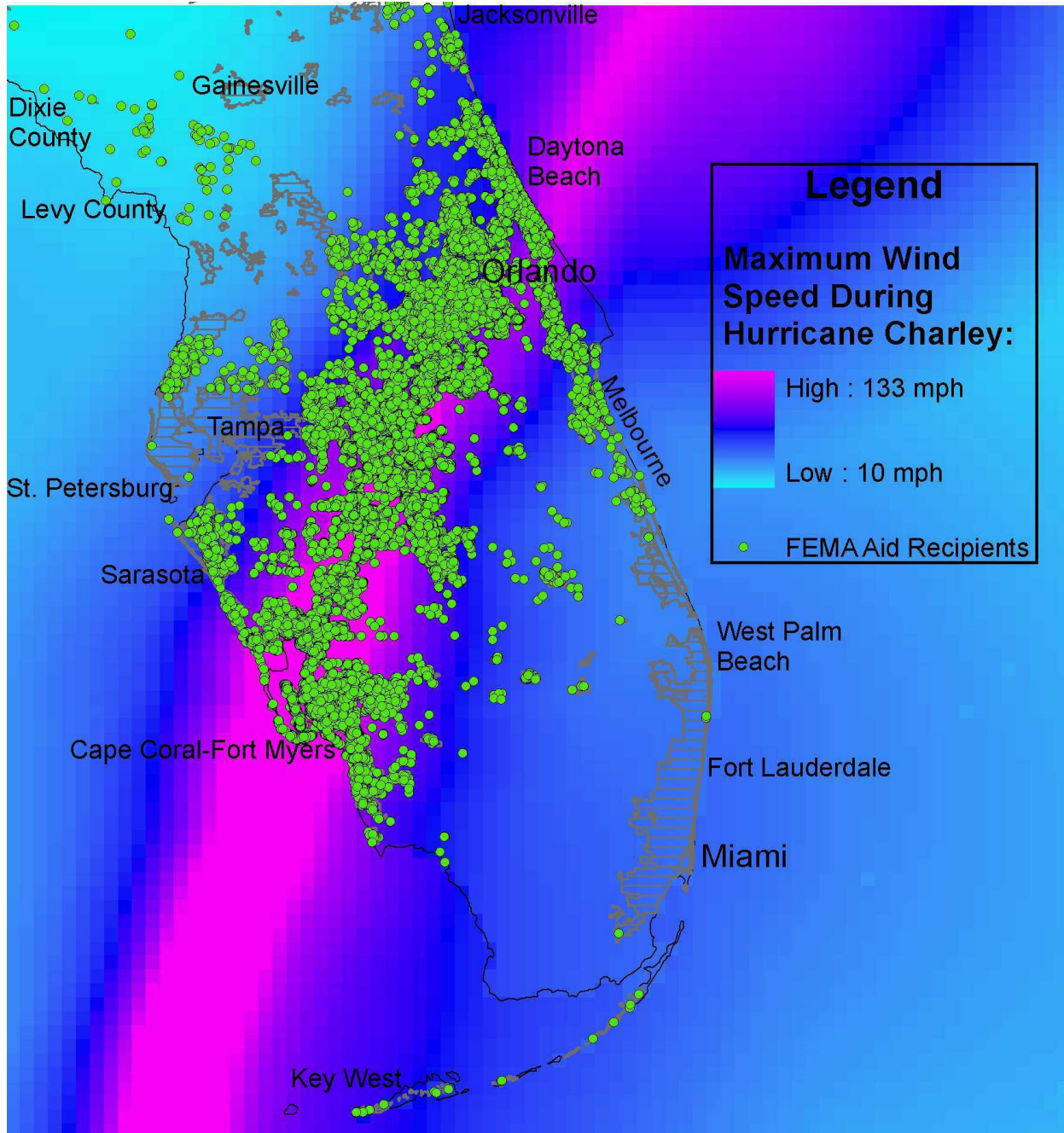
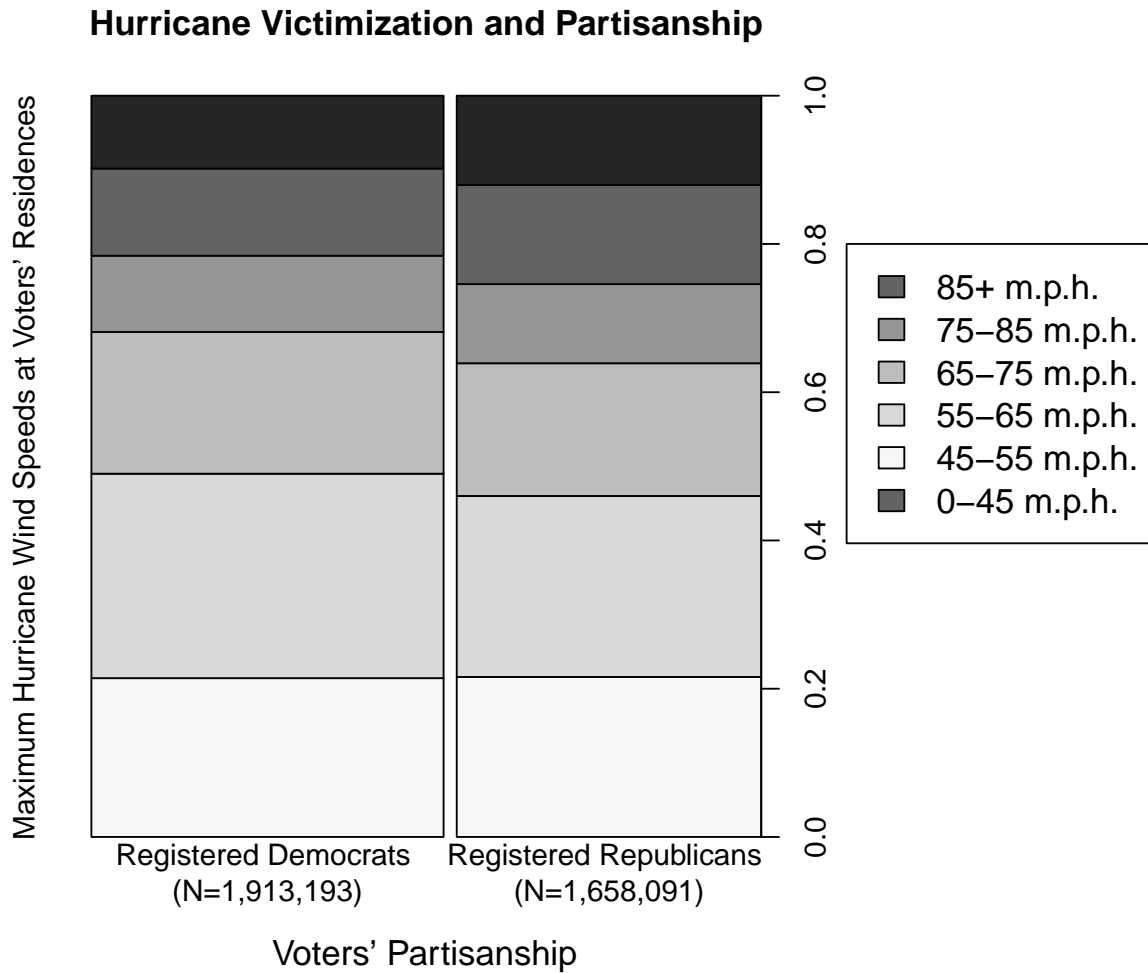


Figure App.2: FEMA Aid Recipients for Hurricane Charley (FEMA Disaster #1539)



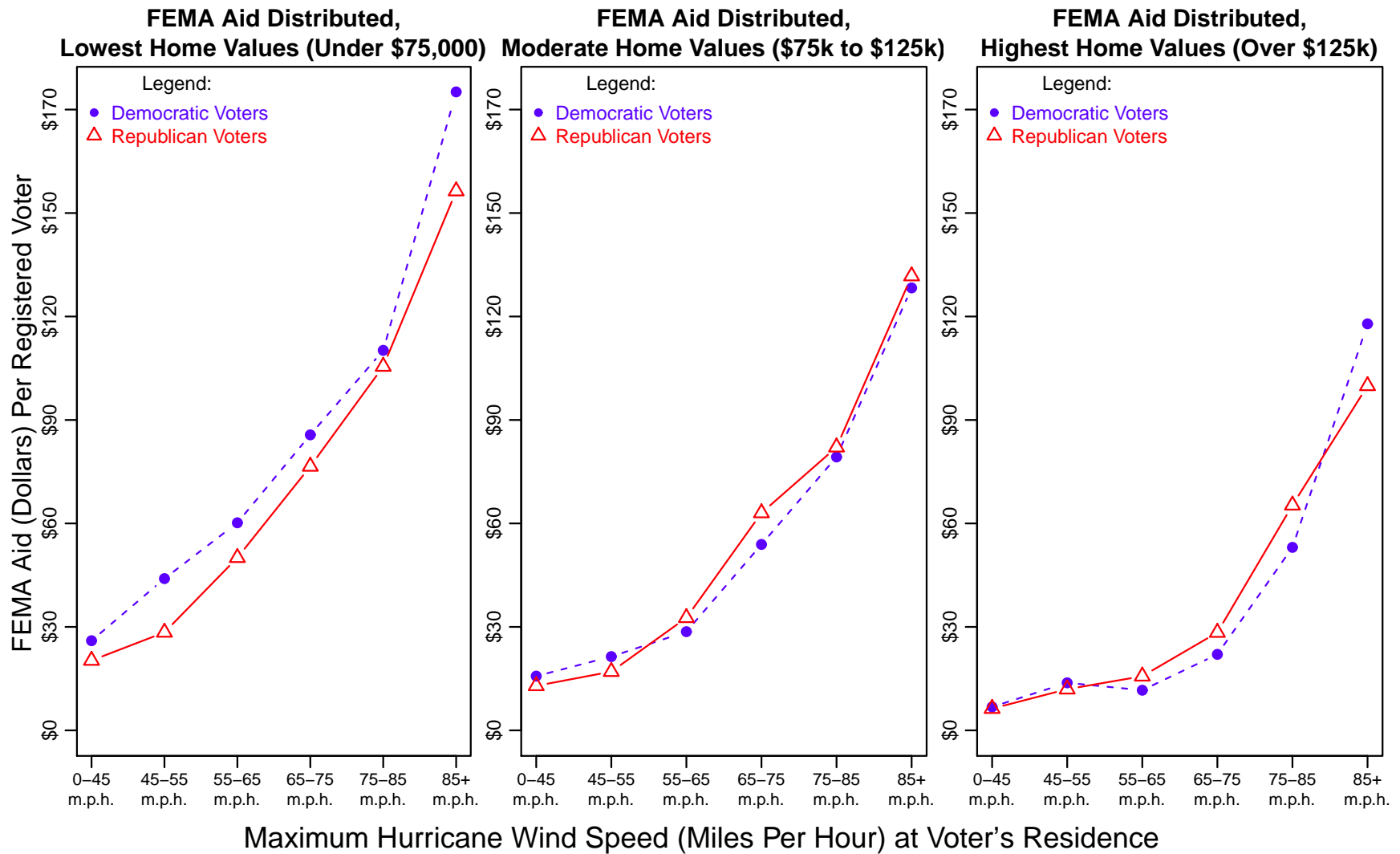
Note: The bright pink strip in this map denotes the center path of Hurricane Charley, which traveled northeast across Florida. The green dots denote the residential location of each successful FEMA aid applicant.

Figure App.3: Hurricane Wind Speeds Experienced by Democratic and Republican Voters



Note: These stacked plots include all Florida registered voters who: 1) were eligible and actively registered to vote in the 2004 general election; 2) were either registered Democrats (left plot) or Republicans (right plot) as of the November 2004 election; and 3) had a residential address that could be geocoded.

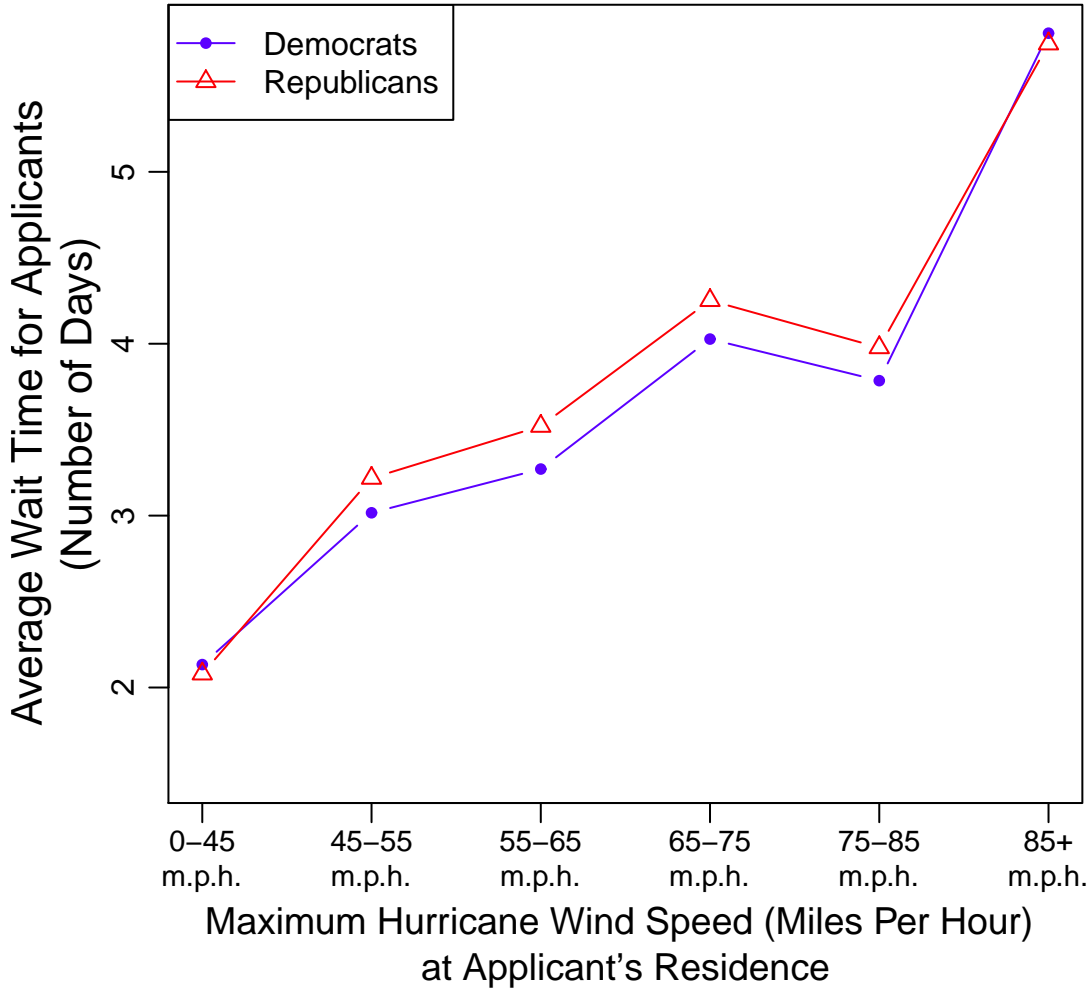
Figure App.4: The Awarding of FEMA Aid by Party, by Home Value Group, and by Hurricane Severity



Note: Data include all individuals who were registered to vote in both the 2002 and 2004 elections, and who were either registered Democrats (blue circles) or Republicans (red triangles) as of the November 2004 election.

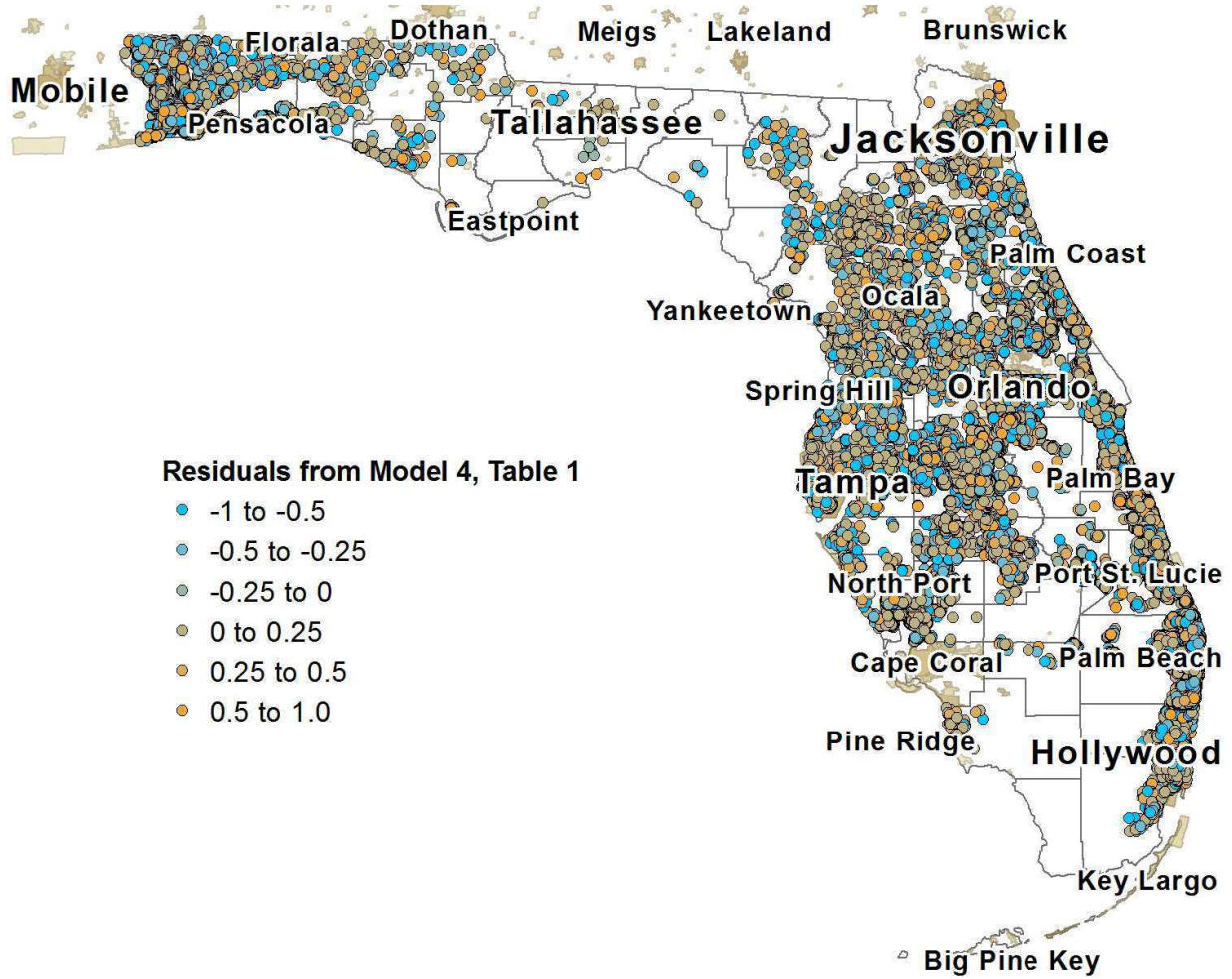
Figure App.5: Efficacy of FEMA Application Process for Democratic and Republican Applicants

Applicants' Average Wait Time for FEMA Inspection



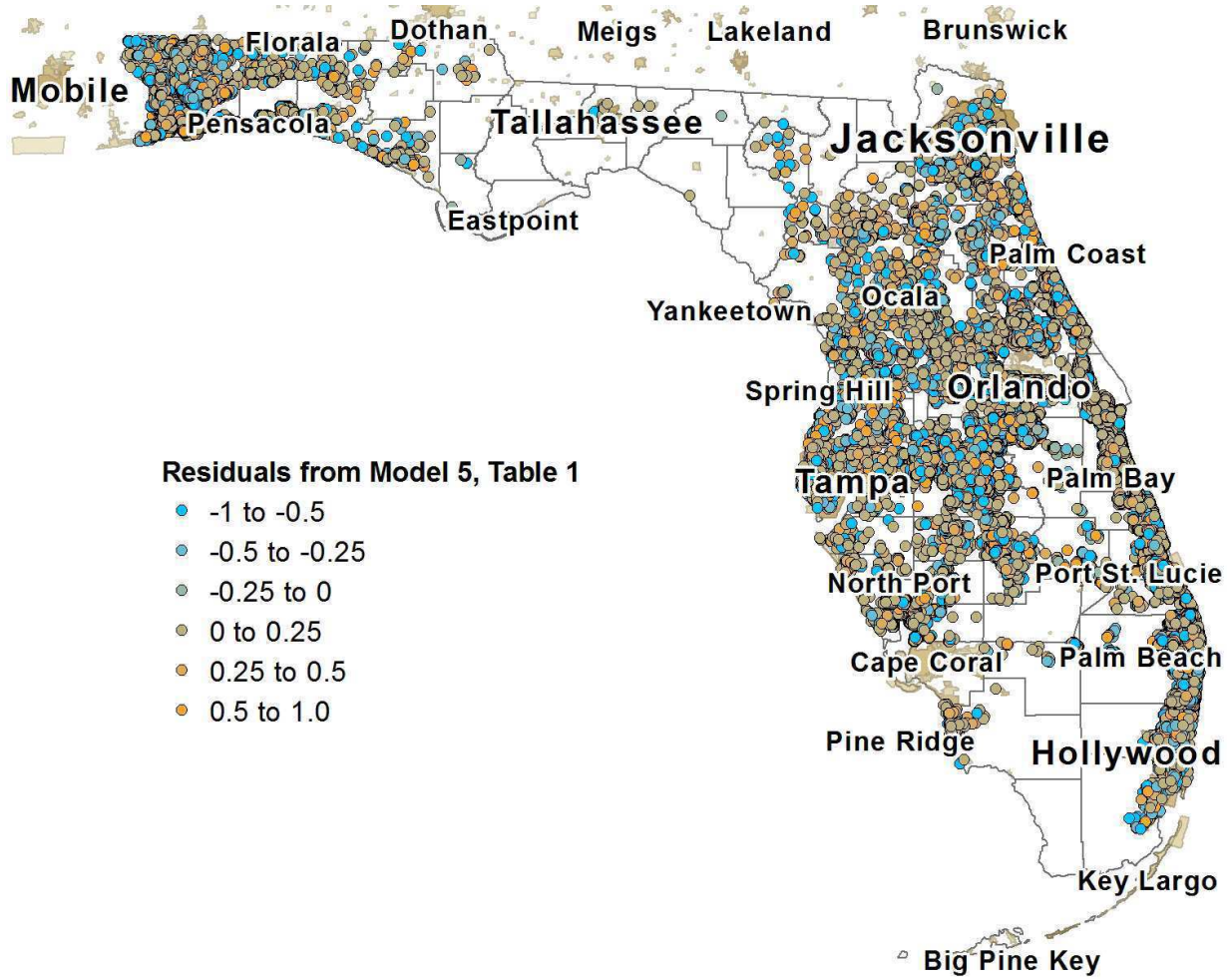
Note: Data include registered voters whose household applied for FEMA disaster aid before the November 2004 election, who were registered to vote in both the 2002 and 2004 elections, and who were either registered Democrats (left plot) or Republicans (right plot) as of the November 2004 election

Figure App.6: Spatial Autocorrelation of Residuals from Table 1, Model 4
(Democratic Applicants)



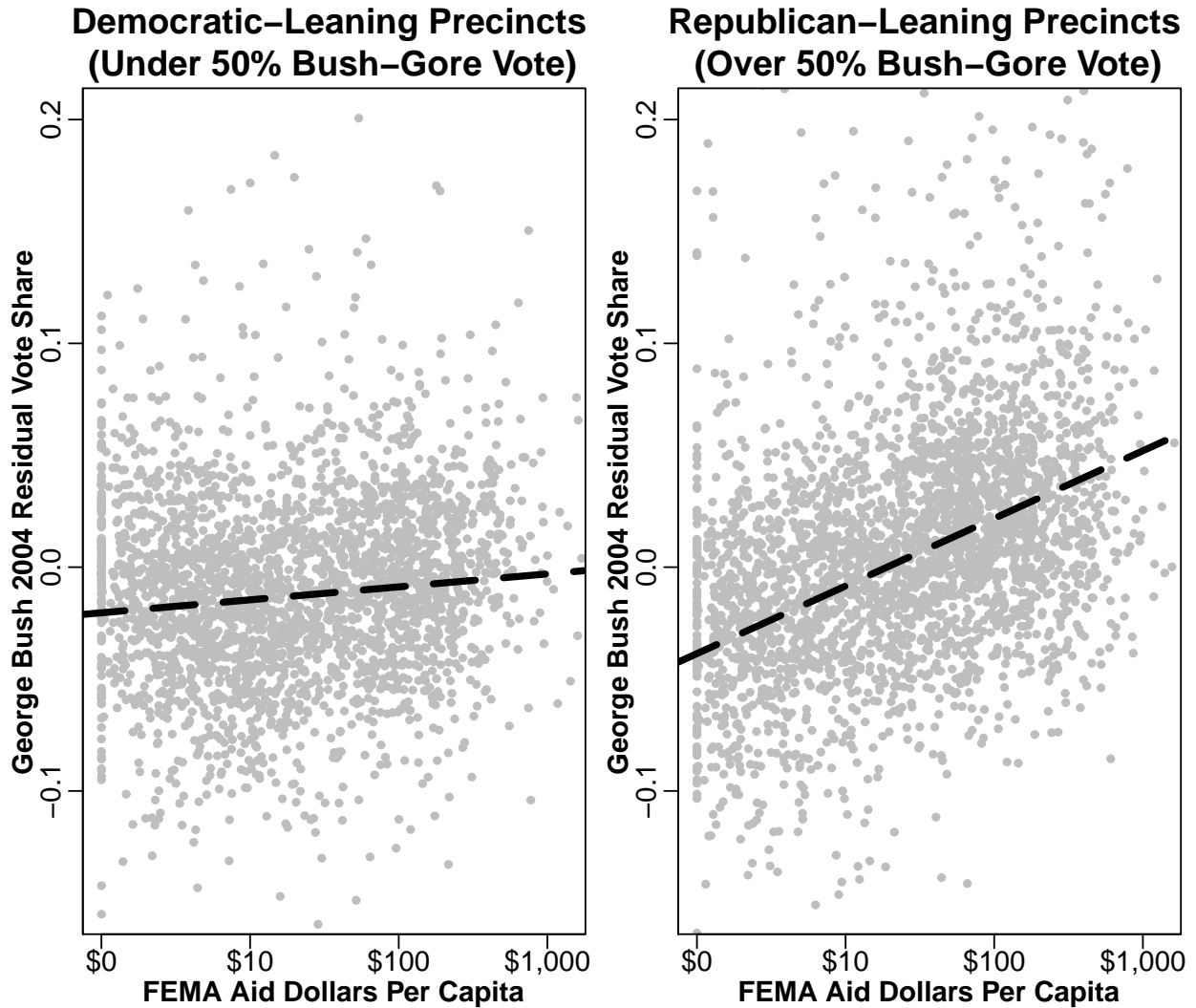
Democrat Residuals	
Moran's I	0.0003287953
Expected (null)	-0.0002235136
Standard Deviation	0.002488056
p-value	0.8243263

**Figure App.7: Spatial Autocorrelation of Residuals from Table 1, Model 5
(Republican Applicants)**



Republican Residuals	
Moran's I	0.002831336
Expected (null)	-0.0002619859
Standard Deviation	0.002527063
p-value	0.220923

Figure App.8: Effect of FEMA Aid on Bush Vote Share in Democratic and Republican Precincts



Note: The vertical axes measure the residuals from the population-weighted least squares regression: $Bush04_i = \alpha + \beta_1 \cdot Bush00_i + \beta_2 \cdot Bush02_i + \beta_3 \cdot Wind_i + \varepsilon_i$, where $Bush00_i$ and $Bush04_i$ are George Bush's precinct-level vote shares from the 2000 and 2004 Presidential elections, respectively, and $JebBush02_i$ is Jeb Bush's precinct-level vote shares from the 2002 Gubernatorial election. $Wind_i$ represents the vector of maximum wind speeds in each precinct during each of the four summer 2004 hurricanes. The dashed line in each plot depicts the least-squares fit. Observations are weighted by each precinct's voting-age population.

The Formal Model:

Players: There are two politicians, an Incumbent (I) and a Challenger (C), who have divergent ideal points. Without loss of generality, we assume that I and C have ideal points $x_I = 1$ and $x_C = 0$, respectively; that is, the incumbent is right-wing and the challenger is left-wing, mirroring the 2004 Bush-Kerry election. At the start of the game, Nature selects the politicians' types, $\theta_I, \theta_C \in \{0,1\}$, with probabilities: $\Pr(\theta_I = 0) = \Pr(\theta_I = 1) = \Pr(\theta_C = 0) = \Pr(\theta_C = 1) = \frac{1}{2}$. θ_I, θ_C are privately revealed to I and C , respectively. As explained below, a politician of type $\theta = 0$ prefers not to deliver aid the voter, while one of type $\theta = 1$ prefers to deliver aid. Finally, there is a single Voter V whose ideal point, denoted $x_V \in (0,1)$, lies somewhere between those of I and C . For clarity, we use female pronouns for the Incumbent I and the Challenger C and male pronouns for the Voter V .

Strategies: The game consists of two periods and an election between the first and second periods. In period 1, the Incumbent I holds office and chooses whether to give the voter V a one-unit distributive aid, $y_1 \in \{0,1\}$. After the first period, V decides whether to participate in the election, $v \in \{0,1\}$, and if so, whether to elect the Incumbent or the Challenger, $e \in \{I, C\}$. If V does not vote, then Nature chooses the winner $e \in \{I, C\}$ with probabilities $(\frac{1}{2}, \frac{1}{2})$. In period 2, the election winner is in office and decides whether to give V a one-unit distributive aid, $y_2 \in \{0,1\}$.

Voter's Utility: During each period $t \in \{1, 2\}$, the voter's utility is:

$$U_V^t = -|x_p - x_V| + y_t, \quad (1)$$

where $y_t \in \{0,1\}$ represents the amount of distributive aid awarded to the voter in period t , x_V represents the voter's ideal point, and x_p is the ideal point of the office-holding politician p , who is either the Incumbent I ($x_I = 1$) or the Challenger C ($x_C = 0$). Hence, the voter's utility depends on his ideological proximity to the office holder as well as his benefit from any distributive aid.

In between the two periods, the voter may choose to vote in the election by incurring a turnout cost, ω , which is randomly drawn by Nature from the uniform distribution $\omega \sim U[0,1]$ and revealed to V prior to the election. Hence, V 's overall utility payoff over the entire game is:

$$U_V = U_V^1 + U_V^2 - \omega \cdot (v), \quad (2)$$

where $v \in \{0,1\}$ is V 's choice of whether to turn out in the election, and U_V^1 and U_V^2 are V 's payoffs from the first and second periods, respectively.

Politicians' Utility: In each period $t \in \{1, 2\}$, each politician $p \in \{I, C\}$ receives the payoff:

$$U_p^t = -|\theta_p - y_t|, \quad (3)$$

where $y_t \in \{0,1\}$ is the executive's choice of distributive aid policy. θ_p denotes the politician's type, which represents her preferred distributive policy. Hence, a politician of type $\theta_p = 1$ prefers to deliver aid ($x_I = 1$), while a politician of type $\theta_p = 0$ always prefers no aid ($x_C = 0$) for V .

Sequence of Play: Formally, the sequence of play is as follows:

1. Nature determines each politician's type, $\theta_I, \theta_C \in \{0,1\}$, with probabilities $(\frac{1}{2}, \frac{1}{2})$ and reveals types privately to I and C , respectively.
2. The incumbent I picks the first period aid amount, $y_1 \in \{0,1\}$.
3. Nature determines the cost of voting, $\omega \sim U[0,1]$.
4. The voter V chooses whether to vote, $v \in \{0,1\}$
- 5(a). If V votes ($v = 1$), then he chooses the election winner, $e \in \{I, C\}$.
- 5(b). If V does not vote ($v = 0$), then Nature determines the election winner, $e \in \{I, C\}$.
6. The winner of the election (I or C) picks the second period aid amount, $y_2 \in \{0,1\}$.

Voter Beliefs: The Voter V does not observe the politician types, θ_I and θ_C , that Nature randomly chooses. Instead, V can only observe the Incumbent's first-period distributive policy, y_1 , and form updated beliefs about I 's type. Let $p_{\theta_I}(\theta|y_1)$ denote the V 's posterior beliefs about the probability that $\theta_I = 1$ after observing y_1 .

Equilibrium Results: In this section, we describe players' strategies and beliefs in Perfect Bayesian Equilibrium and derive testable predictions. For simplicity, we assume that Voter V resolves uncertainty in favor of turning out and in favor of voting for the Incumbent I . Under these assumptions, the game has a unique, fully separating equilibrium solution.

Lemma A (Executive's Distributive Policy): In each period $t \in \{1, 2\}$, the office-holding executive, $p \in \{I, C\}$, chooses the distributive policy: $x_t = \theta_p$. **Proof: Appendix.**

Lemma B (Voter's updated beliefs about Incumbent's type): After observing the Incumbent's choice of $y_1 \in \{0, 1\}$ during the first period, the Voter V 's updated belief about the Incumbent's type is: $p_{\theta_I}(1|y_1) = y_1$. **Proof: Appendix.**

Lemmas A and B state that the equilibrium is fully separating. An Incumbent of type $\theta_p = 1$ always chooses to provide distributive aid ($x_t = 1$), while type $\theta_p = 0$ never provides aid. Hence, the Incumbent's period 1 choice of distributive policy, y_1 , is an informative signal to the voter about her type. As incumbent types are fully separating, the delivery of aid during period 1 thus increases V 's expected payoff from having the incumbent reelected. This increased payoff drives our main result that the delivery of period 1 aid increases a right-wing voter's probability of turnout in the election.

Lemma C: (V's Turnout and Vote Choice): V 's turnout choice in the election is:

$$v = \begin{cases} 1, & \text{if } \omega \leq \bar{\omega}; \\ 0, & \text{otherwise,} \end{cases} \text{ where: } \bar{\omega} = \begin{cases} -y_1/2 - x_v + 3/4, & \text{if } x_v < 1/4; \\ x_v(2y_1 - 1) - y_1 + 3/4, & \text{if } 1/4 \leq x_v < 3/4; \\ y_1/2 + x_v - 3/4, & \text{if } x_v \geq 3/4. \end{cases} \quad (5)$$

$$\text{Conditional on turning out, } V\text{'s vote in the election is: } e = \begin{cases} I, & \text{if } x_v \geq \frac{3-2y_1}{4}; \\ C, & \text{otherwise.} \end{cases}$$

Proof: Supplemental Appendix.

These *Lemmas* describe the equilibrium strategies of the Incumbent and the Voter. *Lemma C* describes V 's preferred candidate in the election. Conditional on turning out, a right-wing voter elects the Incumbent, while a left-wing voter elects the Challenger. But a moderate voter prefers the Incumbent if she provided aid during period 1 and prefers the Challenger otherwise. The intuition behind this result is as follows. The Voter derives utility both from the ideological leaning of the office-holder and from any distributive aid he receives. The Incumbent is right-wing, and the Challenger is left-wing. Hence, a solidly right-wing and left-wing voter always vote for the Incumbent and the Challenger, respectively, regardless of their distributive policies. But a moderate voter ($1/4 \leq x_v < 3/4$) is relatively ideologically indifferent and will prefer the Incumbent only if she has demonstrated a favorable distributive policy during period 1.

Additionally, *Lemma C* states that the Voter V turns out in the election only if the cost of voting, ω , is sufficiently low. The intuition here is that V 's decision of whether to turn out in the election depends on whether his expected utility from electing his preferred candidate sufficiently exceeds his expected utility from allowing Nature to randomly determine the election winner.

From the equilibrium results described in *Lemmas A* through *C*, we derive three testable predictions concerning changes in electoral outcomes caused by the distribution of aid:

Proposition 1 (Effect of Distributive Aid on Voter turnout):

I(a) (Left-wing turnout): For a left-wing voter ($x_v < 1/2$), receiving distributive aid in period 1 causes a strict decrease in the probability of voter turnout.

I(b) (Right-wing turnout): For a right-wing voter ($x_v > 1/2$), receiving distributive aid in period 1 causes a strict increase in the probability of voter turnout.

Proof: Supplemental Appendix.

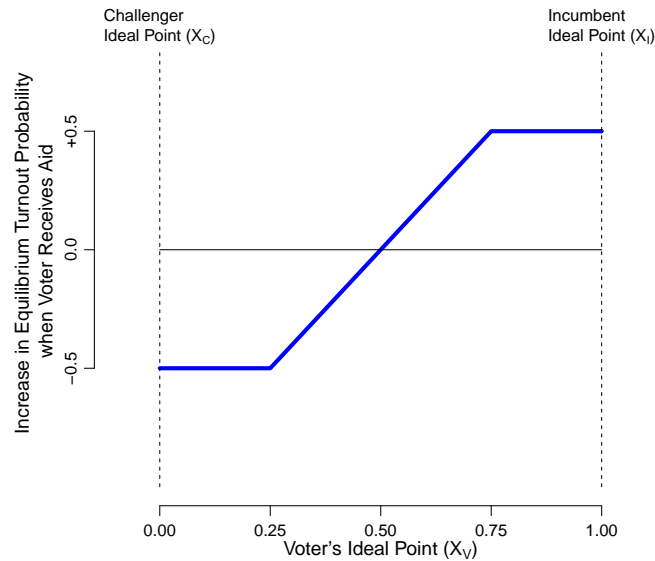
Proposition 1 represents the main theoretical and empirical result of this manuscript. This *Proposition* describes how voter turnout changes in response to receiving aid: Receiving aid in the first period causes a relatively larger increase in a right-wing voter's turnout probability but a relatively smaller decrease in a left-wing voter's turnout probability.

Why does disaster aid affect voter turnout in opposite directions for a right-wing and a left-wing voter? The intuition behind this result is that for both types of voters, the delivery of aid in period 1 enhances voter perception of the incumbent's quality. This perceived high quality increases a right-wing voter's preference for the incumbent over the challenger, and it decreases a left-wing voter's motivation to expel the incumbent in favor of the challenger. Hence, the right-wing voter becomes more motivated to vote and reelect the incumbent, while the left-wing voter becomes less motivated to oust the incumbent by voting.

Figure App.9 visually depicts these *Proposition 1* results, calculated from the equilibrium

turnout strategies described in *Lemma C*. This figure plots the marginal change in equilibrium turnout (vertical axis) caused by the incumbent's delivery of aid as a function of the voter's ideal point, x_V (horizontal axis). As illustrated in this plot, distributive aid causes a decrease in the turnout of a left-wing voter but an increase in turnout for a right-wing voter.

Figure App.9
The Effect of Aid on Voter Turnout
in Equilibrium (Proposition 1)



Proposition 2: *Providing distributive aid during period 1 strictly increases the incumbent's probability of re-election. Proof: Supplemental Appendix.*

Proposition 2 states that in equilibrium, an *Incumbent* who delivers aid in period 1 always enjoys a higher probability of reelection than an *Incumbent* who does not deliver aid. The intuition behind *Proposition 2* is as follows. The delivery of aid during the first period is an informative signal to the voter that the incumbent will again deliver aid in period 2 if reelected. This information increases a right-leaning voter's incentive to re-elect the incumbent and decreases a left-wing voter's motivation to oust the incumbent in favor of the challenger, as demonstrated in *Proposition 1*. Either an increase in right-wing turnout or a decrease in left-wing turnout increase the right-wing *Incumbent's* probability of winning re-election, as Nature chooses the election winner if the voter does not turnout. Hence, distributive aid affects not only turnout, but also the outcome of the election.

Formal Model Proofs

Proof of Lemma A: In each period $t \in \{1, 2\}$ and for either politician $p \in \{I, C\}$, p 's utility payoff

$$\text{is: } U_p^t(x_t) = -|\theta_p - y_t| = \begin{cases} -|\theta_p - \theta_p|, & \text{if } y_t = \theta_p; \\ -1, & \text{if } y_t \neq \theta_p. \end{cases} \text{ Hence, in the final period, } t=2, \text{ choosing}$$

$y_2 = \theta_p$ is a strictly dominant strategy. In period $t=1$, an incumbent of type $\theta_I = 0$ could increase her probability of reelection by choosing $y_1 = 1$, but this increased probability is never sufficiently large to outweigh the disutility of playing her less-preferred strategy in period 1. Hence, choosing $y_1 = \theta_I$ is always strictly dominant.

Proof of Lemma B: Via Lemma A, incumbent types are fully separating in equilibrium, so after observing y_1 , V 's updated belief about I 's type is: $p_{\theta_I}(\theta | y_1) = y_1$.

Proof of Lemma C: Given Lemma B, V expects to receive $E(y_2 | e = I) = y_1$ units of aid in period 3 if I is reelected and $E(y_2 | e = C) = E(\theta_C) = 1/2$ units of aid if C wins the election. Hence, V 's expected second period payoff from I 's reelection would be: $EU_V(e = I) = -(1 - x_V) + y_1$, whereas his expected third period payoff from C 's election would be: $EU_V(e = C) = -x_V + 1/2$. Therefore, conditional on turning out, V votes for I iff:

$$EU_V(e = I) \geq EU_V(e = C) \Rightarrow -(1 - x_V) + y_1 \geq -x_V + 1/2 \Rightarrow x_V \geq \frac{3 - 2y_1}{4}. \quad (6)$$

When x_V is above the threshold in Eq. 6, V prefers that the Incumbent win the election, so V 's total expected payoff from voting would be:

$$EU_V(v = 1 | x_V \geq (3 - 2y_1)/4) = -(1 - x_V) + y_1 - \omega.$$

When x_V is below the threshold in Eq. 6, V prefers that the Challenger win the election, so V 's total expected payoff from voting would be:

$$EU_V(v = 1 | x_V < (3 - 2y_1)/4) = -x_V + 1/2 - \omega.$$

In both cases, V 's total combined expected payoff from not voting is:

$$EU_V(v = 0) = \frac{EU_V(e = I)}{2} + \frac{EU_V(e = C)}{2} = \frac{-(1 - x_V) + y_1}{2} + \frac{-x_V + 1/2}{2} = \frac{y_1}{2} - \frac{1}{4}.$$

Hence, in equilibrium, V turns out to vote iff: $EU_V(v = 1) \geq EU_V(v = 0) \Rightarrow \omega \leq \bar{\omega}$, where:

$$\bar{\omega} = \begin{cases} -y_1/2 - x_V + 3/4, & \text{if } x_V < 1/4; \\ x_V(2y_1 - 1) - y_1 + 3/4, & \text{if } 1/4 \leq x_V < 3/4; \\ y_1/2 + x_V - 3/4, & \text{if } x_V \geq 3/4. \end{cases}$$

Proof of Proposition 1: Via Lemma C, the Voter turns out iff ω , which is drawn from $\omega \sim U[0,1]$, is sufficiently low. Let $T_{y_1}(x_V)$ denote the probability of turnout for a voter with ideal point x_V and who receives $y_1 \in \{0,1\}$ of aid during period 1. Applying Eq. 5, we have:

$$T_{y_1}(x_V) = \begin{cases} -y_1/2 - x_V + 3/4, & \text{if } x_V < 1/4; \\ x_V(2y_1 - 1) - y_1 + 3/4, & \text{if } 1/4 \leq x_V < 3/4; \\ y_1/2 + x_V - 3/4, & \text{if } x_V \geq 3/4. \end{cases} \quad (7)$$

Hence, the change in turnout probability caused by the delivery of aid ($y_1 = 1$) in period 1 is:

$$T_1(x_V) - T_0(x_V) = \begin{cases} -1/2, & \text{if } x_V < 1/4; \\ 2x_V - 1, & \text{if } 1/4 \leq x_V < 3/4; \\ 1/2, & \text{if } x_V \geq 3/4. \end{cases} \quad (8)$$

which is graphed on the left plot of Figure App.9. This quantity is strictly positive when $x_V > 1/2$ and strictly negative when $x_V < 1/2$.

Proof of Proposition 2: Let $R_{y_1}(x_V)$ denote the incumbent I 's probability of reelection after delivering $y_1 \in \{0,1\}$ of aid during period 1 to voter V , whose ideal point is x_V . Incumbent reelection occurs either when V votes for the incumbent, $e = I$, or when V abstains from the election and Nature randomly chooses the incumbent. Via *Lemma C*, we have:

$$R_{y_1}(x_V) = \begin{cases} \Pr(\omega \leq \bar{\omega}|y_1) + \frac{1}{2} \cdot [\Pr(\omega > \bar{\omega}|y_1)], & \text{if } x_V \geq (3 - 2y_1)/4, \\ \frac{1}{2} \cdot [\Pr(\omega > \bar{\omega}|y_1)], & \text{otherwise.} \end{cases} \quad (9)$$

$$\Rightarrow R_{y_1}(x_V) = \begin{cases} y_1/4 - x_V/2 + 1/8, & \text{if } x_V < 1/4; \\ x_V/2 + (1 + 2y_1)/8, & \text{if } 1/4 \leq x_V < 3/4; \\ y_1/4 - x_V/2 + 1/8, & \text{if } x_V \geq 3/4. \end{cases}$$

Applying *Eq. 5*, the delivery of aid in period 1 increases I 's reelection probability by the amount: $R_1(x_V) - R_0(x_V) = 1/4 > 0$, $\forall x_V \in [0,1]$, proving *Proposition 2*.