How Lasting Is Voter Gratitude? An Analysis of the Short- and Long-Term Electoral Returns to Beneficial Policy

Michael M. Bechtel ETH Zurich
Jens Hainmueller Massachusetts Institute of Technology

Dominant theories of electoral behavior emphasize that voters myopically evaluate policy performance and that this shortsightedness may obstruct the welfare-improving effect of democratic accountability. However, we know little about how long governments receive electoral credit for beneficial policies. We exploit the massive policy response to a major natural disaster, the 2002 Elbe flooding in Germany, to provide an upper bound for the short- and long-term electoral returns to targeted policy benefits. We estimate that the flood response increased vote shares for the incumbent party by 7 percentage points in affected areas in the 2002 election. Twenty-five percent of this short-term reward carried over to the 2005 election before the gains vanished in the 2009 election. We conclude that, given favorable circumstances, policy makers can generate voter gratitude that persists longer than scholarship has acknowledged so far, and elaborate on the implications for theories of electoral behavior, democratic accountability, and public policy.

Elections incentivize politicians to calibrate policy to voter preferences if voters reward good and punish poor policy performance electorally. This incentivizing effect of electoral accountability crucially depends on voters' retrospective evaluations. To secure the welfare-improving effect of democracy, voters need to remember, evaluate, and reward the policies that incumbents deliver. Yet, many perceive citizens as having a short-lived memory when it comes to political issues and electoral choice (Achen and Bartels 2008; Bartels 2008; Campbell, Converse, Miller, and Stokes 1960; Gerber and Green 1998; Lenz 2010; Zaller 1992). The political economy literature (Downs 1957; Mueller 2003; Nordhaus 1975; Rogoff 1990) and studies of economic voting (Cohen and Noll 1991; Duch and Stevenson 2006; Fiorina 1978; Lewis-Beck and Paldam 2000) typically emphasize that myopic voters care only about recent policy benefits and that this shortsightedness provokes inefficient public policy. If electoral rewards for beneficial policy decay rapidly, then reelection pressures induce policymakers to bias policy toward opportunistic short-term solutions and to underinvest in more sustainable long-term efforts aimed at improving overall welfare (Achen and Bartels 2004; Keech 1980; Sobel and Leeson 2006).

Despite the potential gravity of this problem, we possess little systematic knowledge about the time horizons that voters employ to evaluate policy performance and the durability of electoral rewards for beneficial policy. Precisely how long can politicians and parties expect to earn electoral credit for their past policies? Can massive policy benefits generate voter gratitude that survives long enough to yield electoral rewards in more than one

Michael M. Bechtel is a Senior Researcher, Center for Comparative and International Studies, WEC 25, CH-8092 Zurich (bechtel@ir.gess.ethz.ch). Jens Hainmueller is Assistant Professor of Political Science, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139 (jhainm@mit.edu).

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election cycle? While some scholars have begun to explore the possibility of long-term electoral effects of broad economic performance measures such as changes in real income (Achen and Bartels 2008), we still lack evidence for how long citizens electorally reward more specific beneficial policies such as targeted government transfers.

We address this question by advancing a dynamic perspective on retrospective voting that distinguishes between short- and long-term electoral returns to beneficial policy. Our goal is to estimate a temporal response curve that describes how fast electoral rewards decay over time in an ideal case: voter gratitude with respect to large and concentrated aid and relief spending in the context of a major natural disaster, the 2002 Elbe flooding in Germany. This natural disaster triggered policies that constitute a fitting natural experiment both because of their timing and the magnitude of the benefits provided. The Elbe flooding occurred only about one month prior to the 2002 federal election and was the most devastating flood in Germany in over a thousand years. It provided Chancellor Schröder and his incumbent Social Democratic party (SPD) with a key opportunity to win over voters through a massive policy response to avert the widely expected defeat in the upcoming election. In response to the flooding, the government swiftly launched the largest disaster relief program ever delivered in German postwar history. It included the deployment of over 45,000 soldiers as well as rapid and massive transfers of relief aid to citizens in affected areas.

Using the Elbe flooding as a natural experiment and a difference-in-differences identification strategy, we find that the policy response increased SPD vote shares in the affected regions by about 7 percentage points on average in the 2002 election. These positive returns are consistent with previous studies that have shown significant short-term gains to relief spending in the U.S. context (Chen 2008, 2010; Healy and Malhotra 2009; Lay 2009). Our estimates imply that the relief spending increased votes for the SPD government at a price of about €63,000 per vote in the 2002 election. Additional tests indicate that these short-term electoral gains were mostly driven by persuasion effects, rather than the mobilization of new voters. Turning to the longevity of the electoral rewards, we find that about 25% of the massive short-term electoral return carried over to the next election in 2005. Compared to the 1998 baseline, the SPD received 2 percentage points more votes in the affected regions in the 2005 federal election than it would have received without the flood response. This suggests that voters still rewarded the government's massive policy response even several years after the flood. The price of an additional vote in the regions affected by the flood decreased to about €48,600 on average. We find no electoral gains in the 2009 election; the electoral returns are small and not significant at conventional levels. Thus, after seven years, the flood response seems to have entirely vanished from the retrospective evaluations of voters in the affected areas.

Our temporal perspective reveals that at least in the context of massive disaster relief efforts, policy makers can generate electoral rewards that persist longer than myopic retrospection would lead us to expect. Although these findings starkly contrast with the literature that highlights voters' myopic assessments of public policy, we emphasize that the electoral rewards we document presumably constitute an upper bound for how long-lasting performance rewards can be, since the disaster response was very salient, included the distribution of massive benefits, and was easily attributable for voters. The extant literature on voter myopia, in contrast, has mostly explored how citizens respond to less salient events such as changes in macroeconomic conditions which involve relatively dispersed benefits and are often difficult to attribute to incumbents' policy decisions. In the conclusion, we elaborate on the implications of our findings for theories of voting behavior, democratic accountability, and public policy.

Short- and Long-Term Electoral Returns to Disaster Relief Aid

Our analysis of the short- and long-term electoral returns to disaster relief aid builds on the electoral accountability literature and previous work on retrospective voting. Numerous studies have considered the short-term electoral returns to policy benefits. In the economic voting literature, many studies have demonstrated that retrospective voters reward incumbents for good economic performance in the short run (Clarke, Stewart, and Whiteley 1998; Duch and Stevenson 2006; Fair 1996; Kirchgässner 1985; Lewis-Beck 1986). A more recent strand of literature examines the electoral rewards for specific beneficial policies such as federal transfers and disaster relief spending. Levitt and Snyder (1997) present evidence for electoral returns to federal spending in U.S. congressional elections. An increase of $100 per capita in spending yields a 2% increase of the popular vote. In an early study, Abney and Hill (1966) examine voter reactions to a large rescue and relief program in response to Hurricane Betsy, which triggered disastrous flooding in southeastern Louisiana. They consider the 1965 New Orleans mayoral election and find that the incumbent mayor lost votes in both affected and unaffected precincts

to an almost equal extent, despite prompt relief spending. Healy and Malhotra (2009) explore how voters incentivize incumbents to invest in disaster preparedness and relief policies in the United States and find that citizens only reward disaster relief spending. This explains why governments typically underinvest in economically more efficient preparedness measures while providing substantial, yet economically less efficient, relief aid. Chen (2010) finds that disaster relief aid provided in the aftermath of the 2004 Florida hurricane season increased George W. Bush's vote share in the 2004 presidential election in Republican precincts, but failed to boost Bush's vote share in Democratic precincts.

These studies demonstrate that voters reward incumbents for government transfers, but they focus almost exclusively on short-term rewards and leave open the question of whether such beneficial policies can build more lasting electoral support. Some studies have begun to explore potential long-term rewards for macroeconomic performance. For example, Achen and Bartels (2008) argue that changes in real income in election years can contribute to long-term partisan realignments (see also Mayhew 2002). But we still know very little about potential long-term rewards for more specific beneficial policies such as government transfers.

From a standard rationalist perspective, citizens have little reason to become deeply informed about political matters and to keep this information in their long-term memories as holding governments accountable constitutes a public good. Individuals may use heuristics to minimize the costs of becoming informed about political issues and the incumbent's competence. Lenz (2010) argues that retrospective policy evaluations follow a "peak-and-end" heuristic known from laboratory experiments in psychology (Fredrickson and Kahneman 1993; Langera, Sarin, and Weber 2005). Applied to the voting context, this heuristic suggests that the event associated with the highest utility level and the final event in the election cycle most strongly affects voters' evaluations. Although most existing studies about the "peak-and-end" heuristic are limited to laboratory experiments covering short time intervals and using nonelection contexts, some evidence suggests that the mechanism may travel to electoral settings. Bartels (2008) finds that in the United States, Republican administrations have provided income growth at the time of elections to cater to shortsighted voters, who appear to pay attention only to the last quarter of economic performance before the election.

If retrospective judgement follows the "peak-and-end" rule, then voters should receive the highest utility from very intense, extremely targeted beneficial policies, and these should generate the most pronounced and durable electoral rewards if incumbents deliver them immediately prior to the election. Disaster relief in response to natural disasters constitutes a prime example of particularly concentrated, beneficial policies that receive strong public attention. Moreover, compared to standard redistributive programs or the income effects of economic growth, relief spending is temporally and geographically highly concentrated and strongly directed toward affected individuals.[1]

Thus, although disaster relief spending may produce large imminent electoral gains, the idea of shortsighted, forgetful voters who suffer from an end bias in their retrospective evaluations implies that citizens heavily downweight government transfers provided in the more distant past. But so far we still lack evidence on how quickly electoral rewards for beneficial policy abate. Manacorda, Miguel, and Vigorito (2009) provide a first step in this direction. They find that government transfers as part of a large antipoverty program in Uruguay increased political support for the incumbent government, and that slightly smaller gains in electoral support persisted at least until about three months after the transfers stopped. But a more comprehensive test requires an examination of a longer horizon to estimate the rate at which electoral rewards for large government transfers decay over time.

Below we provide such a test by considering the short- and long-term electoral rewards to the massive relief spending triggered by the 2002 Elbe flooding in Germany. By estimating the rate of decay of the electoral returns to disaster aid, we deliver empirical evidence on whether beneficial policies can build lasting electoral support. From the perspective of the "peak-and-end" rule, this case provides an ideal setting for exploring the possible upper limits to long-term electoral rewards, since the government provided large, concentrated benefits right at the end of the electoral cycle. Since the policy response was both "peak" and "end," it should have had the highest probability of becoming entrenched in individuals' long-term memories. If voters forget quickly about such profound and extremely cost-intensive programs, then presumably the long-term electoral rewards for more standard policies deteriorate even more rapidly.

[1] Hence, governments tend to favor relief over preparedness spending. Relief spending is more targeted, is more publicly observable, attracts more media attention, can more easily be temporally attributed, and appears more attractive to shortsighted, forgetful voters (Healy and Malhotra 2009). See Cohen and Werker (2008) and Kahn (2005) for studies that focus on how democratic institutions and international disaster aid affect the level of disaster preparedness.

The Elbe Flooding and the Incumbent's Policy Response

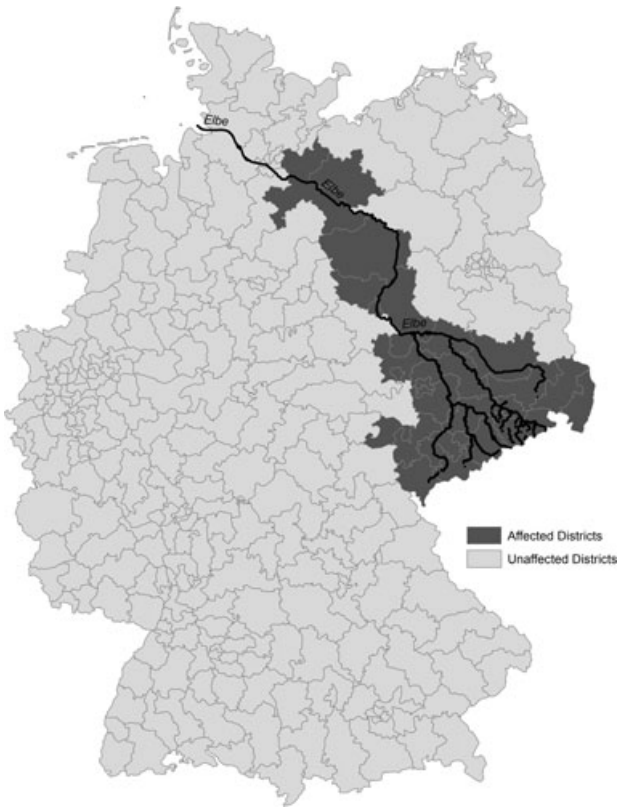
We now turn to the empirical estimation of an upper bound for the electoral rewards to policy benefits and their rate of decay by analyzing the effects of massive disaster relief provided in the context of the 2002 Elbe flooding. Prior to the Elbe flooding, citizens had little reason to reelect the incumbent government led by Chancellor Gerhard Schröder in the federal election in September 2002 (Roberts 2003; Rohrschneider and Fuchs 2003; Schoen 2003). During his 1998 electoral campaign, Schröder had promised to reduce unemployment below 3.5 million until 2002 and explicitly demanded that citizens should vote him out of office if he failed to achieve this target. But by early 2002 unemployment had increased to 4.3 million, an increase of 300,000 since the start of Schröder's term. Moreover, macroeconomic forecasts provided little reason to believe in a quick recovery of the weakening economy. Adding to the frustration over the weakening economy, Schröder also promised to implement a series of highly unpopular labor market reforms. Unsurprisingly, Chancellor Gerhard Schröder's Social Democratic Party (SPD) and his coalition partner, the Greens, were lagging in the polls (Hogwood 2004). Many expected the conservative Christian Democratic Party (CDU) together with the Liberals (FDP) to oust the Schröder government in a landslide in the upcoming election in September 2002 (Hogwood 2004).

A series of unprecedented rainfalls, which began in early to mid-August and peaked around the 12th to 13th, caused the Elbe River to trigger the worst flood in modern German history. By August 17 the Elbe River reached an all-time high of 9.4 meters in Dresden, the highest mark ever recorded. From a hydrological perspective, floods with such severity occur only once every 500 to 1,000 years (IKSE 2003). Figure 1 displays a map of all 299 electoral districts in the 2002 election. All electoral districts that were directly affected by the flood are highlighted in dark gray (the coding of affectedness is described below). The affected districts cluster along the Elbe River and extend from the area south of Hamburg all the way toward the border with the Czech Republic in a southeastern direction.

In sum, the affected regions suffered 21 casualties and more than 30,000 people had to be evacuated. The best available estimates indicate that the economic damage from the flood exceeded €15 billion (Bundesministerium der Verteidigung 2002; Mechler and Weichselgartner 2003). This damage compares in size to that caused by the 1999 earthquakes in Turkey and amounts to more than 50% of the damage from Hurricane Andrew and approximately 12% of the estimated damage from Hurricane Katrina (Sawada and Shimizutani 2008). In Dresden, one of the most affected cities, the local damage amounted to €400 million, equaling 47% of the annual municipal budget of 2002. In the Sachsen region, the flood damage amounted to about 42% of the annual regional budget of 2002 (Mechler and Weichselgartner 2003).

While the flood caught all political parties by surprise, it fundamentally changed the campaign dynamics for the upcoming election (exogenously) scheduled for September 22 in ways particularly important from the perspective of our theory.[2] The incumbent SPD

FIGURE 1 Affected versus Unaffected Electoral Districts in the 2002 Election



Note: The map shows the boundaries of the 299 electoral districts in the 2002 German federal election. Directly flood-affected districts (i.e., *Flooded* = 1) are shaded dark gray; unaffected districts are shaded light gray. A district was coded as affected if it experienced at least one of the following events: stabilization or breach of levees, flood warning, overtopping of levee, flooding, evacuation warning, or evacuation. Source: Own computation based on flood report by the International Commission for the Protection of the Elbe River (2002).

[2]The timing of regular federal elections in Germany is fixed exogenously (article 39 of the German constitutional law).

immediately capitalized on the opportunity and swiftly initiated a massive policy response that lasted well until election day. Right after the first flood reports came in, Minister of Defense Peter Struck (SPD) rushed to visit the affected areas and publicly announced that the German forces would do everything they could to help (Bundesministerium der Verteidigung 2002, 21). By August 20, only three days after the Elbe had reached an all-time high in Dresden, the government had already sent about 45,000 soldiers to serve in the affected regions, stabilizing dams, evacuating people in danger, and coordinating the disaster response. It was the largest military disaster relief operation ever carried out by the German military forces since World War II. The German forces continued their operations until mid-September to help with cleanup and reconstruction work of postwar proportion.

In addition to sending troops, Chancellor Schröder announced an emergency program in mid-August that provided €385 million in disaster relief aid. The first payments went out only two days later (Hogwood 2004, 254). They included immediate payments of €500 per affected person (max €2,000 per household) and €5,000 per affected residential property building. Affected businesses were paid €15,000 and €500 per employee (Mechler and Weichselgartner 2003, 31). Moreover, the incumbent SPD/Greens coalition initiated legislation that promised even more disaster relief aid. On August 26, it introduced a "Flood victims solidarity" bill (*Flutopfersolidaritätsgesetz*) backed up by a €7.1 billion disaster relief fund, the largest amount ever spent in the context of a natural disaster in German history.[3]

The disaster relief fund started to disburse payments to voters almost immediately following the passage of the bill (Hogwood 2004; Mechler and Weichselgartner 2003). By the time that affected voters came to the polls, many of them had already received direct support payments from the government. Overall, the relief fund compensated 78 percent of the direct damage from the flood, a proportion that by far exceeds historical standards for similar disasters (Mechler and Weichselgartner 2003, 37).[4] Although all parties and candidates unequivocally supported the flood response, the flooding unmistakably highlighted a simple, yet crucial difference between incumbent and challenger: "Schröder had access to federal funds and the means to reallocate them: Stoiber did not" (Hogwood 2004, 254).

The incumbent SPD/Greens government was reelected in the 2002 federal election, but their majority in parliament was slim: 302 seats were required for a majority in parliament and the incumbent SPD/Greens government received 306 seats (SPD: 251 seats, Greens: 55 seats). In fact, the election outcome was so close that based on the first projections, challenger Edmund Stoiber announced that he and his coalition consisting of the CDU, CSU, and the Liberals had won the election (von Alemann 2003, 58).

Data, Research Design, and Methodology

Our units of analysis are electoral districts, the lowest level at which vote shares are publicly available for federal elections. In order to generate conservative estimates of the electoral returns to the flood response, we consider a binary treatment indicator, called *Flooded*, that measures whether an electoral district was affected by the Elbe flood and the associated disaster response. In particular, this variable takes the value of zero for unaffected districts and the value of one for electoral districts that experienced at least one of the following events: stabilization or breach of levees, flood warning, overtopping of levee, flooding, evacuation warning, or evacuation. We include flood damage that occurred from the Elbe as well as its major flooded tributaries wherever damage occurred.[5] We coded this measure based on information from a detailed report on the Elbe flood published by the International Commission for the Protection of the Elbe River (IKSE 2003). We also cross-checked our coding using the less detailed report on the Elbe flood published by the State of Sachsen (Sächsisches Landesamt für Umwelt und Geologie 2002). Figure 1 displays the treated electoral districts and the Elbe River as well as its tributaries. The flooding affected 29 districts, all but two of them located in East Germany. The detailed list of affected districts is provided in the Supporting Information appendix.[6]

[3]Sixty percent of the fund was disbursed in 2002, the rest in 2003. The relief fund did not cover costs arising from the military operation.

[4]International data on financial compensation for disaster damage suggests that the average financial compensation across all major floods and earthquakes recorded in the 1990–2000 period amounted to about 45% of the recorded losses; the maximum compensation in the same period was 57% in the case of the 1997 flooding in Poland (Linnerooth-Bayer and Quijano-Evans 2003; Mechler and Weichselgartner 2003).

[5]As is common for floods of this severity, some of the most disastrous damage resulted from smaller tributaries such as the Müglitz, the Gottleuba, or the Mulde (IKSE 2003). We therefore include these flooded tributaries in our coding.

[6]Notice that other studies have used more direct measures such as state- or even precinct-level relief spending (Chen 2008, 2010;

The empirical analysis relies on a difference-in-differences strategy to identify the short-term and long-term electoral rewards for the policy response to the 2002 Elbe flood. We consider $i = \{1, ..., N\}$ electoral districts for elections in years $t = \{1994, 1998, 2002, 2005, 2009\}$. Let D_{it} be our binary *Flooded* indicator that is coded one for districts that are directly affected by the flood between the current and the previous period and zero otherwise. Our outcome of interest is the SPD's proportional representation (PR) vote share in a given district. Let Y_{dit} denote potential outcomes, where Y_{1it} and Y_{0it} indicate the pair of potential vote shares that the SPD attains in district i at time t when exposed to the treatment or the control condition between the current and the previous period.

Our first quantity of interest is the short-term electoral effect of the flood response, which we define as the average treatment effect on the treated (ATT) given by $\alpha = E[Y_{1i,2002} - Y_{0i,2002} \mid D_i = 1]$. This estimand measures the average difference between the posttreatment vote shares that the affected districts attain with and without the treatment. Since we do not observe $E[Y_{0i,2002} \mid D_i = 1]$, we identify this missing potential outcome based on the usual difference-in-differences assumption of parallel trends. Specifically, we assume $E[Y_{0i,2002} - Y_{0i,1998} \mid D_i = 1] = E[Y_{0i,2002} - Y_{0i,1998} \mid D_i = 0]$, which says that in the absence of the flood, the average SPD vote share in the affected districts would have followed a similar trend as the average SPD vote share in unaffected districts. Based on this assumption, the ATT is identified from observed outcomes as

$$\alpha = \{E[Y_{i,2002} \mid D_i = 1] - E[Y_{i,1998} \mid D_i = 1]\} - \{E[Y_{i,2002} \mid D_i = 0] - E[Y_{i,1998} \mid D_i = 0\}.$$

We estimate α using a standard fixed effects regression given by

$$Y_{it} = \eta_i + \delta_t + \alpha D_{it} + X'_{it}\beta + \varepsilon_{it},$$

where η_i is a district-level fixed effect to control for any time-invariant unobserved factors, δ_t is a period fixed effect to control for common trends, α is the treatment effect, X_{it} is a vector of time-varying covariates including a constant, and ε is an idiosyncratic error term with $E[\varepsilon \mid \eta, \delta, D, X] = 0$.

To account for potential serial correlation and heteroskedasticity, we cluster the standard errors by district. In order to avoid potential posttreatment bias, we present the main results with and without including our time-varying covariates (which may be affected by the treatment). Notice that the districts underwent some redistricting between the elections. In particular, between 1998 and 2002 the number of districts was reduced from 328 to 299 districts. Between 2002, 2005, and 2009 the number of districts has remained at 299, but a few district borders were redrawn. We have adjusted all covariates and outcome variables for this redistricting for all the regressions.[7] In addition to the short-term effects of the flood response, we are also particularly interested in the long-term electoral rewards. We identify the long-term effects using similar difference-in-differences regressions to estimate the differential vote share trends between affected and unaffected districts comparing the 1998 to the 2005 and the 2009 elections.

To probe the plausibility of our identification assumption, we conduct a falsification test and estimate a placebo difference-in-differences regression with a similar specification for the 1994 to 1998 preflood period. This is an important test to check whether affected and unaffected districts followed similar trends prior to the flooding.

Results

Model 1 in Table 1 presents the results from our falsification test. To probe our identification assumption of parallel trends in the absence of the treatment, we run our difference-in-differences regression for the preflood period (the 1994 and 1998 elections). We find that SPD PR vote shares in the affected and unaffected districts follow

Healy and Malhotra 2009). Unfortunately, such data are unavailable in our context. We have also reestimated our models using a more fine-grained treatment measure that further distinguishes between affected and strongly affected districts. Districts were coded as affected if they experienced a flood warning, stabilization of levees, or were mentioned as being relatively mildly affected by the flood (IKSE 2003). We coded districts as strongly affected if they were mentioned to have experienced a breached levee, flooding, or evacuation. The results are substantively identical to the ones presented here, with electoral rewards being significantly higher in more strongly affected districts.

[7] This adjustment uses two sources. For each pair of subsequent elections, the Federal Election Commission (FEC) releases vote results based on the current and previous district geography. These data are used to examine short-term changes in vote shares. To include covariates and to examine changes in vote shares beyond the subsequent election, we spatially reweight the covariates and votes from election to election using GIS district border shape files that the FEC provided to us for every election since 1994. We split the districts into nonoverlapping polygons across elections and then recompute the covariates and votes on the basis of the 1998 borders using area-weighted averages. We also cross-checked the reweighted vote shares against the vote share data that the FEC releases for each election pair, and the results matched up closely. Overall, the redistricting has little effect on vote results, since legal constraints prevent gerrymandering and redistricting decisions are made by an independent electoral commission (see article 3, paragraph 3 of the German federal election law).

TABLE 1 Short- and Long-Term Effects on SPD PR Vote Shares

Dependent Variable	SPD PR Vote Share									
Election Years	1994–1998		1998–2002			1998–2005			1998–2009	
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Flooded	−0.00	7.14	6.91	6.78	1.99	1.94	1.54	1.29	0.89	0.72
	(0.34)	(0.47)	(0.57)	(0.68)	(0.47)	(0.47)	(0.45)	(0.66)	(0.57)	(0.49)
Post Period	4.61	−2.88	−3.98		−6.77	−6.76		−17.97	−15.03	
	(0.14)	(0.23)	(1.07)		(0.15)	(0.63)		(0.16)	(0.52)	
Population Density			−0.06	−0.05		1.55	1.03		2.53	1.23
			(1.36)	(1.36)		(1.22)	(1.21)		(0.88)	(0.59)
Share of Elderly			0.40	0.41		−0.01	0.02		−0.12	−0.11
			(0.40)	(0.40)		(0.17)	(0.16)		(0.10)	(0.07)
Population Outflow			−0.04	−0.04		0.06	0.07		−0.04	−0.01
			(0.03)	(0.03)		(0.02)	(0.02)		(0.02)	(0.01)
Unemployment Rate			−0.13	−0.14		0.11	0.06		0.44	0.26
			(0.20)	(0.20)		(0.14)	(0.13)		(0.09)	(0.07)
Employment Share:			−1.58	−1.56		3.95	3.42			
Agriculture			(3.67)	(3.72)		(2.09)	(2.07)			
Employment Share:			−1.20	−1.22		4.11	3.53			
Manufacturing			(3.58)	(3.62)		(2.09)	(2.06)			
Employment Share:			−1.31	−1.32		4.17	3.59			
Trade Services			(3.59)	(3.63)		(2.10)	(2.07)			
Employment Share:			−1.12	−1.13		4.12	3.58			
Other Services			(3.57)	(3.62)		(2.09)	(2.06)			
Share of Foreigners			20.09	20.00		−8.97	−5.62		−18.85	−13.31
			(15.09)	(14.79)		(10.85)	(9.46)		(11.90)	(5.59)
SPD Incumbent in			−1.12	−1.13		0.02	−0.87		1.87	−0.84
Land			(0.49)	(0.48)		(0.24)	(0.23)		(0.29)	(0.24)
Lagged SPD				−0.02			−0.12			−0.29
Vote Share				(0.03)			(0.02)			(0.02)
Intercept	36.45	40.86	152.84	−3.39	40.85	−373.24	−2.44	40.89	36.05	−4.97
	(0.06)	(0.10)	(357.20)	(1.58)	(0.07)	(209.37)	(1.01)	(0.08)	(2.93)	(0.70)
District Fixed Effects	*x*	*x*	*x*		*x*	*x*		*x*	*x*	
First Differences				*x*			*x*			*x*
N	656	598	598	299	598	598	299	598	598	299

Note: Regression coefficients shown with robust standard errors in parentheses (standard errors for the fixed effects models are clustered by district). Each regression is based on district-level data from two election periods (1994 and 1998 for Model 1; 1998 and 2002 for Models 2–4; 1998 and 2005 for Models 5–7; 1998 and 2009 for Models 8–10). Models 1–3, 5–6, and 8–9 are fixed effects regressions where the dependent variable is the district-level SPD PR vote share. Models 4, 7, and 10 are first differences regressions where the dependent variable is the change in SPD PR vote share between elections and all covariates (except the *Flooded* indicator and the lagged vote share level) are also first-differenced. *Flooded* is coded one for districts that were directly affected by the 2002 Elbe flood and zero otherwise. All variables are adjusted for redistricting. Employment Shares are omitted for Models 8 and 9 since these data are unavailable for this period.

a virtually identical trend prior to the Elbe flood. The SPD on average gains about 4.6 percentage points nationwide, but this increase is identical in treated districts that are eventually flooded in 2002 and control districts that are not directly affected by the 2002 flood. The placebo effect estimate is almost exactly zero (−.00), and the 95% confidence interval ranges from [− .6, .6] percentage points of vote share. This strikingly parallel trend of SPD vote share in both groups in the preflood period increases the confidence in our identification assumption. Given the parallel trends in the preflood period, it seems plausible to assume that, in the absence of the flood, the group of affected and unaffected districts would have continued on approximately parallel trends in the posttreatment period.

Short-Term Electoral Returns

Models 2–4 in Table 1 show our difference-in-differences estimates for the short-term electoral rewards for the flood response as measured by the increase in SPD PR

vote share from the 1998 to the 2002 election. Model 2 presents the benchmark fixed-effects equation. We find that the flood response increased the SPD vote share by a precisely estimated 7.1 [6.4, 7.9] percentage points on average in the flooded districts. This effect is not only highly statistically significant (with a t-statistic of about 15), but it is also large in substantive terms. Compared to the overall SPD PR vote share of 38.5% in 2002, the flood effect constitutes about an 18% increase in vote share. While the SPD lost about 3 percentage points on average in unaffected districts, it experienced strong gains of about 4 percentage points in affected districts. This indicates that voters in the affected areas strongly rewarded the SPD for its swift flood response.

How robust is this short-term electoral gain? In Model 3 we add a large set of time-varying covariates to the benchmark fixed-effects equation to account for changes in observed district-level characteristics (the Supporting Information appendix provides a complete covariate list and their sources). Our set includes controls for sociodemographic shocks such as population density, population outflows, the share of foreigners, and the share of elderly voters. We also include a battery of controls for economic voting, including the unemployment rate and employment shares for different sectors of the local economy. Finally, we include a dummy that measures whether the SPD is the majority party in the state government. This control is added to account for the well-known interaction between federal and state elections (Kedar 2006; Kern and Hainmueller 2006); given the SPD's control of the federal government, we may expect that the party attains fewer votes in districts where it also had control of the government at the state level. The flood effect is robust to including these covariates; the results are virtually identical.

In Model 4 we estimate a first-differenced equation that also adds the lagged SPD PR vote share as an additional control, and the treatment effect estimate remains again unchanged. As an additional robustness test, we also checked that the results are robust to using the nonlinear changes-in-changes model developed in Athey and Imbens (2006). Using this model, the short-term electoral return to the flood response is if anything slightly stronger; SPD vote shares increase by about 9 percentage points on average in flooded districts, and this effect is also consistent across different quantiles (about 11 percentage points at the 1st quartile and 6 percentage points at the 3rd quartile).

Taken together, these results indicate that the SPD experienced a large vote-share increase in flooded districts. However, the regressions still leave open the possibility that the increase in vote share was caused by changes in unmeasured confounding factors that affected SPD vote shares differently in flooded areas. One way to rule out such differential trends in unobserved confounders is to examine trends in SPD popularity in the preflood period. Changes in unobserved factors that are powerful enough to influence vote shares should be picked up in the popularity data. Figure 2 shows the popularity trends for both major parties (based on the *Forsa* poll, the largest available representative opinion survey with about 2,500 respondents per week).[8] For each preelection month in 2002, we estimate the percent of voters who intend to vote for the SPD (left panel) and the CDU/CSU (right panel) in an upcoming election. We find that both the SPD and CDU/CSU experienced broadly similar popularity trends in flood-affected areas and unaffected areas throughout the entire preflood period. In July, the last month before the flood onset, SPD popularity is virtually identical in both groups. However, with the onset of the flood response in August, the SPD gains popularity overall, and these popularity gains are much stronger in flood-affected areas. For the CDU/CSU we find the same pronounced pattern, but in the opposite direction. This result strongly suggests that the excess SPD gains in the affected areas are attributable to the positive effect of the flood response and cannot be accounted for by differential trends in unobserved confounders (unless they happen to coincide with the flood and differentially impact affected and unaffected areas). The only plausible alternative may be a powerful campaign issue that much more strongly resonated with voters in affected areas, a possibility that we further rule out below.

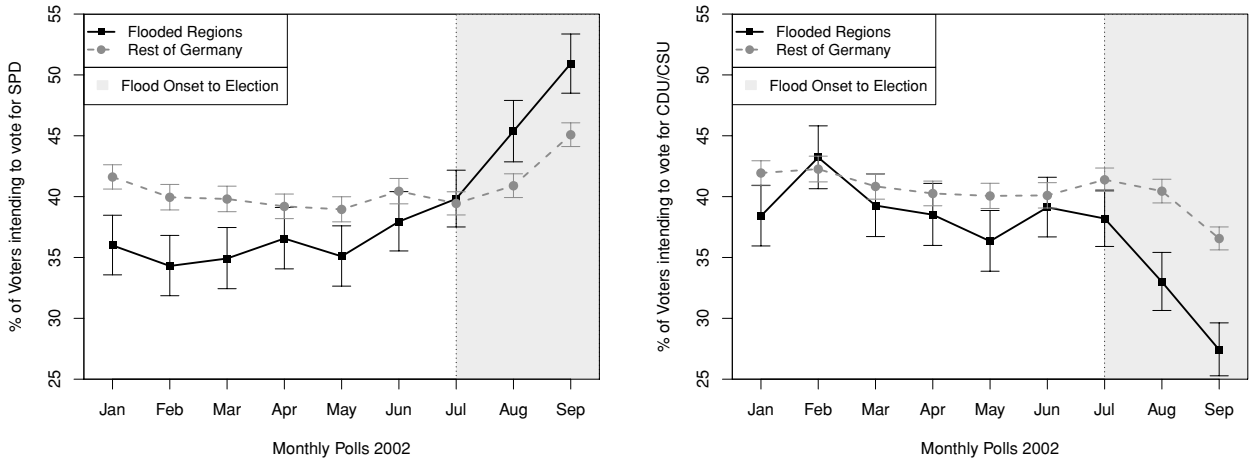
Long-Term Electoral Returns

So far our results suggest that the flood response produced large and highly significant short-term electoral returns in affected districts. How persistent are these rewards in vote share for the incumbent government? In order to assess the long-term electoral returns to the flood response, we estimate similar difference-in-differences regressions comparing the gains in SPD vote share in affected and unaffected districts between the 1998 and 2005 elections. Given the assumption of shortsighted voters and the fact that the 2005 election occurred three years after the flood, we would not expect to see lasting rewards for the SPD in affected areas.

In contrast to this expectation, we find significant and robust long-term rewards. Model 5 in Table 1 shows the

[8]We used the so-called "Sonntagsfrage" from the Forsa dataset. These data are available at GESIS – Leibniz Institute for the Social Sciences, dataset identification code ZA3909.

FIGURE 2 SPD and CDU/CSU Popularity in Flooded Regions versus the Rest of Germany



Note: Percent of voters who intend to vote for the SPD (left panel) and CDU/CSU (right panel) with .90 confidence envelopes. Based on Forsa polling data (average monthly N = 8,753 [min N = 6,044, max N = 9,889]) available at GESIS – Leibniz Institute for the Social Sciences (dataset identification code: ZA3909).

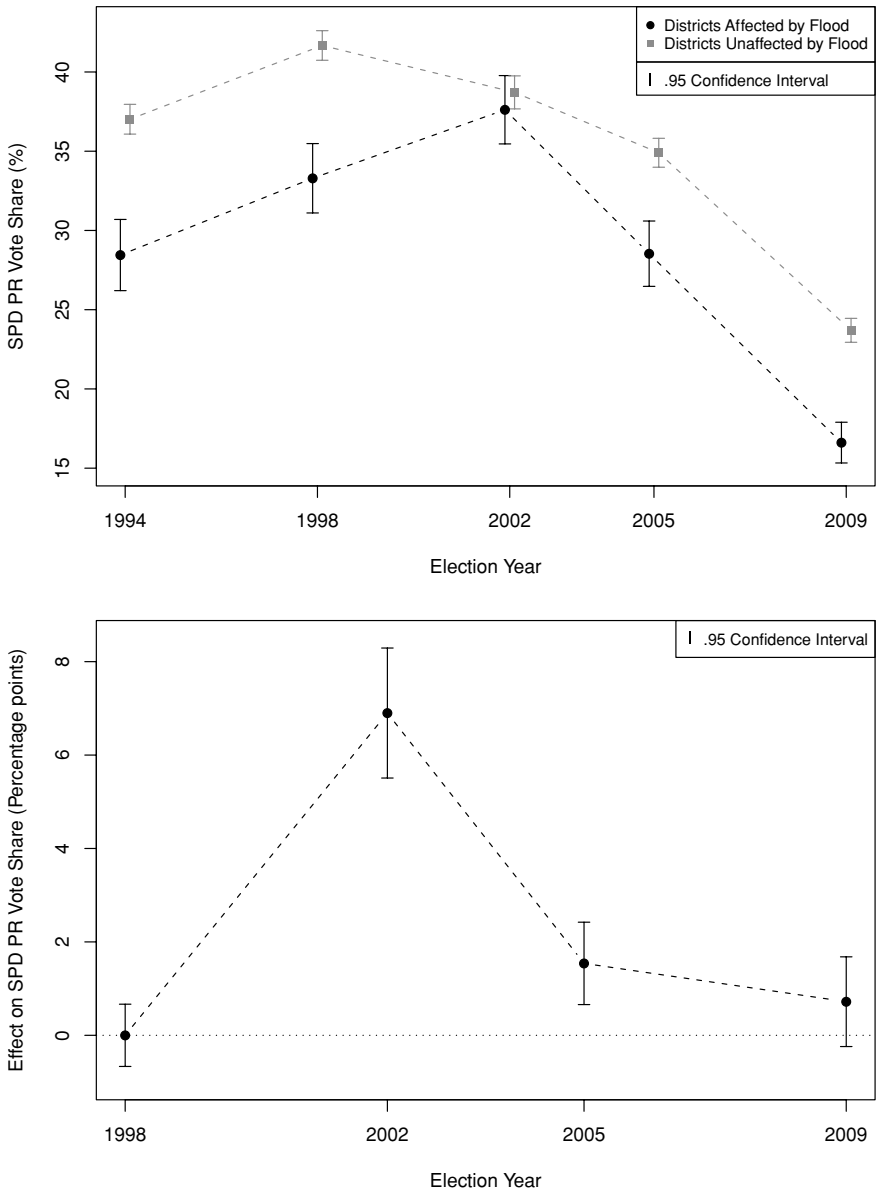
estimates from the benchmark fixed-effects specification. We find that the SPD PR vote share increases by about 2 percentage points on average in directly affected districts. This indicates that about 25% of the short-term electoral gain generated by the SPD's flood response carries over to the 2005 election. As can be seen in Models 6 and 7, this remaining long-term effect is robust to the inclusion of our time-varying covariates and also the lagged vote shares. This evidence suggests that at least in an ideal case scenario such as the massive, targeted benefits provided by the policy response to the Elbe flooding, politicians may be able to reap more lasting rewards from voters for beneficial policies.

In Models 8–10, we consider whether the rewards carry over to the 2009 election. According to the benchmark specification in Model 8, the SPD still enjoys a small, and statistically significant, advantage of 1.3 percentage points of vote share in affected areas. However, this effect is further reduced in magnitude and even becomes insignificant once we enter our time-varying covariates in Model 9. As the most comprehensive model with all covariates and lagged vote shares, Model 10 shows that the SPD gain is further reduced to .7 percentage points, and we no longer have sufficient precision to reject the null at conventional levels (p-value $< .15$). Overall, these findings suggest that, in this second election that occurred seven years after the flood, the electoral returns declined further and are now indistinguishable from zero.

Figure 3 summarizes the overall dynamics of how the electoral returns decay over time. The upper panel shows the trend in vote shares in affected and unaffected districts over the entire period from 1994 to 2009. The lower panel maps out the covariate adjusted return estimates with their 95% confidence envelopes for each of the periods. Starting from almost perfectly parallel trends in the 1994 to 1998 period, the flood response induced large short-term gains in the 2002 election. About a quarter of this return carries over to the 2005 election where the SPD still exhibits excess gains in the affected areas. By 2009, however, the effect has almost faded, and the two groups return to their parallel dynamics as experienced in the preflood period. This return to parallel trends lends confidence to the results, as it suggests that the flood response affected vote choice in two following elections, but was not associated with other fundamental changes that would make affected and unaffected districts incomparable in the long run.

To gain an impression of the short- and long-term electoral returns that explicitly takes into account the massive government transfers, we computed the short- and long-term returns to disaster relief spending and the price of one additional vote in the affected regions. These figures are based on our findings and information about the absolute number of SPD votes in the affected districts. Using the 7 percentage points estimate for our treatment measure and the €7.1 billion size of the disaster relief fund, we can say that the short-term electoral return to the federal incumbent's disaster spending efforts in the affected regions equaled a one percentage point SPD vote share increase per one billion euros. This means that for every billion spent on disaster aid, the incumbent party received about 16,300 additional votes; the average price per vote in the affected regions equals about €61,300 in 2002. Once we take the long-term rewards into account,

FIGURE 3 Trends for SPD PR Vote Share in Affected versus Unaffected Districts



Note: Upper panel shows estimated average SPD PR vote share (with .95 confidence envelopes) for affected and unaffected districts for the federal elections in 1994, 1998, 2002, 2005, and 2009. Lower panel shows covariate adjusted difference-in-differences estimates (with .95 confidence envelopes) for the pretreatment, short-term, and long-term effects of the flood response on SPD PR vote share in affected versus unaffected districts. The effects are estimated for the 1998–1994, 2002–1998, 2005–1998, and 2009–1998 periods.

the vote share gain in flooded regions equals about 9 percentage points, which yields an electoral return of about 19,800 additional votes per billion euros spent on disaster relief. This implies that the price of one vote in the affected regions decreased to €48,600 on average. These prices slightly exceed those reported in Healy and Malhotra (2009) and Chen (2010), whose price estimates are based on more disaggregated relief spending data. Healy and Malhotra (2009) estimate that about $27,000 in relief spending buys one additional vote, and Chen (2010) reports that in the aftermath of the summer 2004 hurricane season, between $12,000 and $37,500 in disaster

relief aid generated one additional vote for George W. Bush.

Electoral Returns and the Iraq Issue

Most of the affected districts were located in East Germany. This spatial clustering of vote gains in East Germany sets the stage for a rival argument. Some analysts have claimed that two issues dominated the 2002 election campaign, the Elbe flood and the question about whether Germany should take part in the U.S.-led war on Iraq (Schoen 2003). But in order to account for our findings, the Iraq issue must have had (1) a large positive effect on SPD votes, and (2) this effect must have exhibited strong heterogeneity in the sense that its size or sign varied systematically between flood-affected and unaffected districts. The empirical evidence is inconsistent with both criteria.

Chancellor Schröder publicly opposed the war on Iraq, but this stance was in line with the large majority of voters all across Germany. More importantly, the evidence strongly suggests that the Iraq issue played almost no role for voters in the affected regions compared to the Elbe flood response. The upper panel in Figure 4 examines the relative importance of these two issues to voters in East Germany. For each month we plot the fraction of respondents in East Germany who perceive the Elbe flood or the Iraq issue to be among the three "most important current problems."[9] The results indicate that the Elbe flood was clearly the dominating issue in the 2002 election. The flood issue started to rapidly gain prominence in August, the month prior to the election, when about 15% of the respondents in East Germany perceived the Elbe flood to be among the three most important current problems. In that same month, only about 1% of the respondents reported that the Iraq war belongs to the three most important problems, suggesting that the Elbe flood and the incumbent's political response to it was the far more important issue. The lower panel of Figure 4 replicates the analysis using a broader definition of the two issues as a robustness check, and the conclusions remain unchanged.[10]

Finally, we find a pronounced spatial gradient in the electoral rewards. In Figure 5 we plot the partial deviance residuals from a General Additive Model (GAM) that orthogonalizes the 1998 to 2002 SPD PR vote share gains to our full set of covariates and a (back-fitted) smoothing spline for the distance to the Elbe River. The plot shows the average residual vote share gains (with twice standard error confidence envelopes) as a function of the distance. Directly flood-affected districts (*Flooded*=1) are highlighted in black. The right figure shows the same plot with superimposed local linear regression lines that visualize the conditional expectation functions that describe how the average residual SPD vote gains vary with the distance to the Elbe within each of the state regions that had at least one directly affected district.

The results indicate that the SPD vote gains are decreasing with distance to the flooded areas even *within* states in East Germany. We would not expect this pattern if the Iraq issue had moved voters and thus triggered the vote gains we document. Clearly, the spatial gradient seems hard to square with the idea that voters were moved by foreign policy issues in a period in which the worst flood in a thousand years destroyed their homes and threatened their lives. Such a spatial relationship is, however, what we would expect if the policy response to the Elbe flood caused the electoral returns we document. Notice also that the spatial gradient of the vote gains suggests that our estimates of the short- and long-term electoral rewards are, if anything, conservative. Our definition of directly affected districts leaves some districts in the control group that may be indirectly affected by positive regional spillovers that arise from the fact that voters who live closer to the directly affected areas may be more likely to reward the SPD electorally for the flood response.[11]

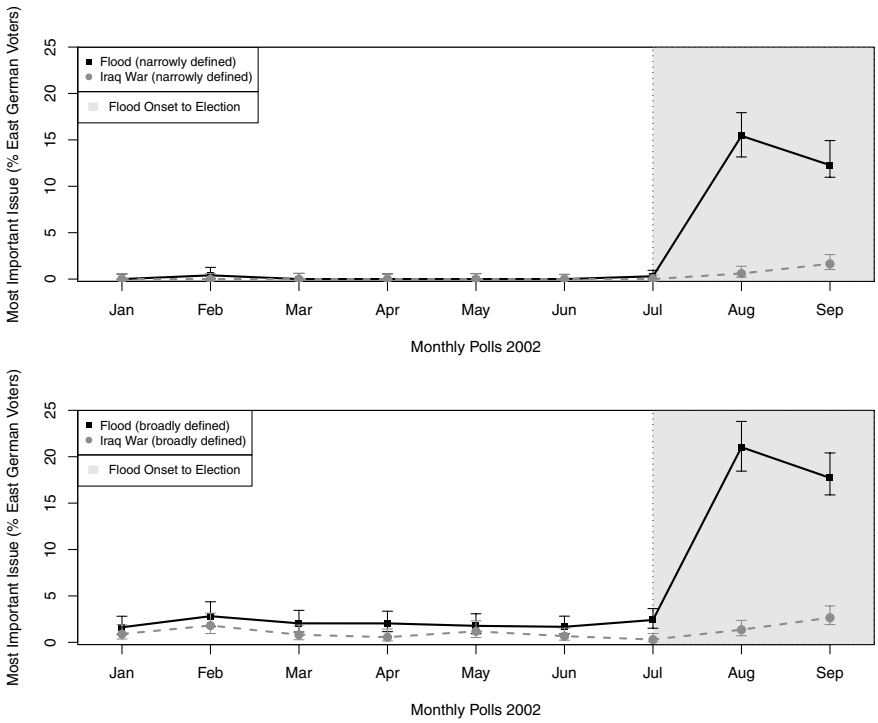
To the best of our knowledge there were no other policies prior to the Elbe flooding that specifically provided government transfers to districts that later were affected by the flood in the 1998 to 2002 period, thereby potentially generating the vote gains we find. Moreover, monthly polling data show that the incumbent's popularity in affected regions was actually always lower than in nonaffected regions in the months before the Elbe flooding occurred in August 2002 (see Figure 2). We do, however, observe a massive jump in the incumbent's popularity in affected regions directly following the flood onset,

[9]Here we include respondents who mention one of the words "flood," "damages from flood," or "how to finance flood damages" for the Elbe issue and the words "discussion about war on Iraq," "US operations against terror," or "Iraq war" for the Iraq issue.

[10]Here we include respondents who mention the words "flood," "damages from flood," "how to finance flood damages," "climate and natural disasters," or "environmental policy" for the Elbe issue and the words "discussion about war on Iraq," "US operations against terror," "Iraq war," "foreign policy," "war and conflict in general," or "wars in the world in general" for the Iraq issue.

[11]Voters who are geographically close may indirectly benefit from the flood aid or feel a sense of solidarity with citizens in directly affected areas. We leave it for future research to systematically explore such spillover effects.

FIGURE 4 Relative Importance of Issues: Elbe Flood versus Iraq (East Germany)



Note: Percent of voters who mention the Elbe flood and/or the Iraq war when asked about the "three most important current problems" with .90 confidence envelopes. The upper panel employs a narrow and the lower panel a broader definition of both political issues. *Flood narrowly defined* includes all respondents who mention "flood," "damages from flood," or "how to finance flood damages." *Flood broadly defined* also includes respondents who mention "climate and natural disasters" or "environmental policy." *Iraq narrowly defined* includes all respondents who mention "discussion about war on Iraq," "US operations against terror," or "Iraq war." *Iraq broadly defined* also includes respondents who mention "foreign policy," "war and conflict," or "wars in the world." Results are based on Forsa polling data (average monthly N = 8,753 [min N = 6,044, max N = 9,889]) available at GESIS – Leibniz Institute for the Social Sciences (dataset identification code: ZA3909).

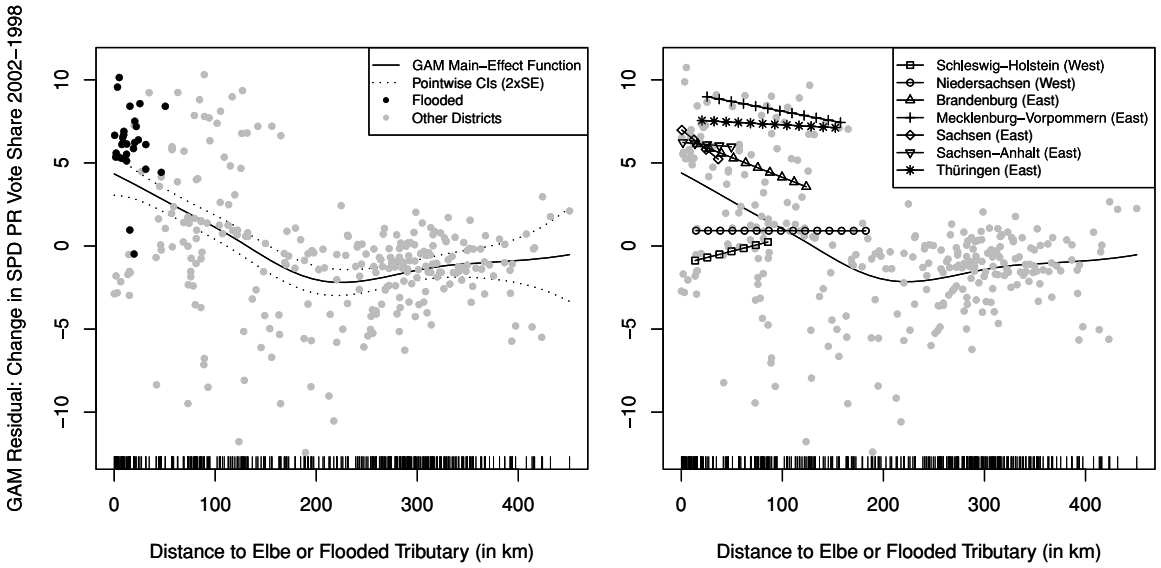
and this increase leads popularity levels to exceed those in nonaffected regions for the first time in 2002. This timing of events suggests that the flood and the policy response caused the electoral rewards and not some other policy that the incumbent had enacted earlier.[12]

Persuasion or Mobilization

Two mechanisms can potentially explain the increase in SPD vote shares. First, the flood response may have persuaded voters who were already going to turn out to switch their vote to the SPD. Second, the flood response could have mobilized individuals who would have otherwise abstained to turn out for the SPD. Figure 6 plots the estimated fraction of eligible voters who intend to turn out in the election throughout the pre- and postflood periods. The time series almost perfectly follow parallel trends in affected and unaffected areas throughout the flood period. This pattern is consistent with the argument that the flood response affected SPD vote shares primarily through a persuasion effect, rather than through mobilizing voters who would have otherwise abstained. Figure 7 provides further evidence for a persuasion effect. In the left panel, we plot the proportion of citizens who intend to vote for the SPD among its former supporters (defined as the group of voters who report having voted for the SPD in the 1998 federal election). Throughout the preflood period, only about 75% of these former SPD voters

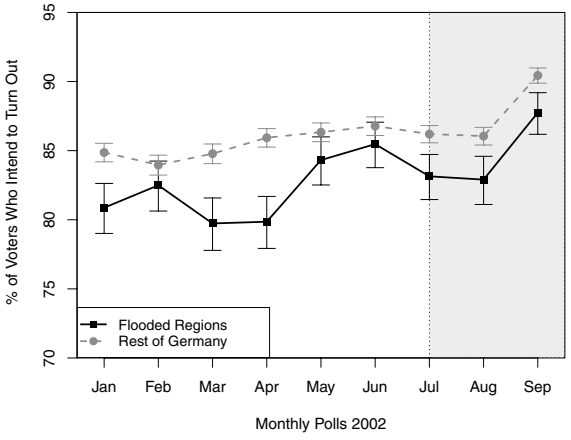
[12]We also explored the monthly popularity ratings of the two candidates running for Chancellor and found exactly the same pattern.

FIGURE 5 Change in SPD PR Vote Share 2002–1998 and Distance to Elbe



Note: The changes in SPD PR vote share from the 1998 to 2002 elections are modeled with a General Additive Model (GAM) that includes the full set of covariates and a (back-fitted) smoothing spline for the distance to the Elbe River or the closest flooded tributary. The left figure plots the partial deviance residuals from the GAM fit against the distance to the Elbe with the main-effect function superimposed (and twice standard error confidence envelopes). Directly flood-affected districts (*Flooded* = 1) are highlighted in black. The right figure shows the same plot with superimposed local linear regression lines that visualize the conditional relationship between SPD vote gains and the distance to the Elbe within each of the land regions that have at least one directly affected district.

FIGURE 6 Mobilization: Flooded Regions versus the Rest of Germany



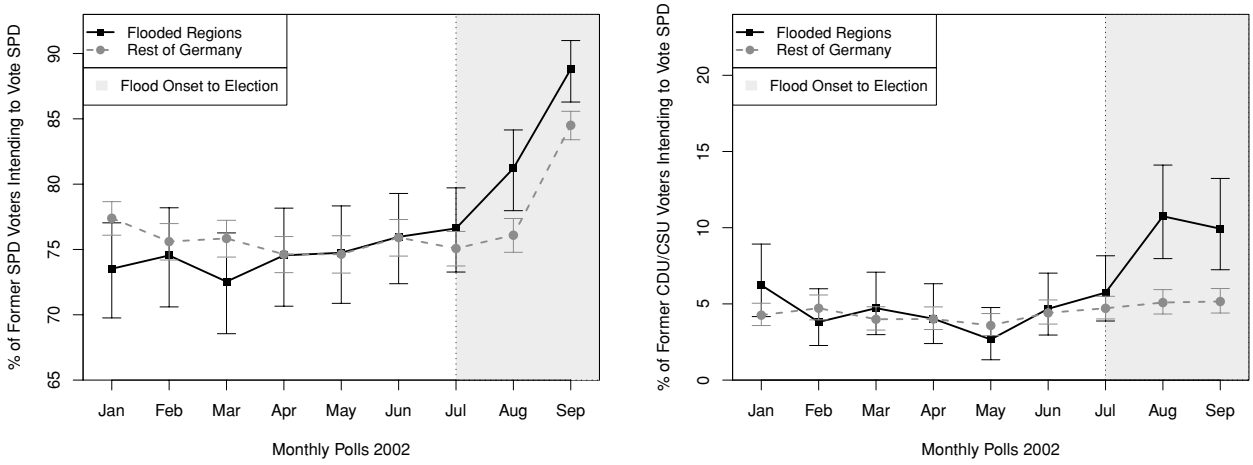
Note: Percent of eligible voters who intend to turn out with .90 confidence envelopes. Based on Forsa polling data (average monthly N = 8,753 [min N = 6,044, max N = 9,889]) available at GESIS – Leibniz Institute for the Social Sciences (dataset identification code: ZA3909).

still intend to vote for the SPD, which indicates that the party had lost grounds among its traditional voter base. Both time series again evolve similarly in affected and unaffected areas before the flood sets in. Following the flood onset, however, the SPD rapidly wins back voters, and these gains are considerably stronger in affected as compared to unaffected areas. This suggests that the swift flood response stemmed defection of former SPD voters and persuaded them to turn out for their party again (as opposed to voting for another party). Finally, the right panel in the figure plots the fraction of former CDU/CSU voters who intend to vote for the SPD. We find similar differential SPD gains amongst this group, indicating that the flood response also won over a significant number of former CDU/CSU supporters, which clearly hints at a persuasion effect.[13]

An examination of the changes in vote shares further corroborates these findings from the polling data. We regress CDU/CSU vote shares on all covariates using the benchmark model and find that the major opposition party lost about 2.2 [1.2, 3.2] percentage points on average in the flooded districts. Apart from winning over potential CDU voters, the SPD's massive flood response effort may have also swayed some PDS voters from the left of the political spectrum, since the socialist party is a fierce competitor for the SPD in many of the affected districts.

[13]Our inspection of the polling data focuses on the two major parties here, because the sample sizes of citizens who intend to vote for the minor parties (Greens, FDP, PDS) in the affected regions are too small to allow for reliable inferences.

FIGURE 7 Persuasion: Flooded Regions versus the Rest of Germany



Note: Left panel shows percent of respondents who intend to vote for SPD among voters who voted for the SPD in the 1998 election with .90 confidence envelopes. Right panel shows percent of respondents who intend to vote for SPD among voters who voted for the CDU/CSU in the 1998 election with .90 confidence envelopes. Based on Forsa polling data, average monthly N = 8,753 (min N = 6,044, max N = 9,889), available at GESIS – Leibniz Institute for the Social Sciences (dataset identification code: ZA3909).

Again using the benchmark model, we estimate that the PDS experienced even higher losses than the CDU/CSU of about 3.5 [2.7, 4.2] percentage points in the flooded districts.[14] Taken together, these results indicate that the flood response increases SPD vote shares mainly through persuasion, rather than mobilization of new voters.

The extent to which the policy response generated the electoral rewards through mobilization and/or persuasion may affect their durability. Given that nonvoters have no or at best weak long-term partisan attachments, massive policy benefits may generate more long-lasting support when they mobilize individuals who originally intended to abstain. In contrast, if the policy response induces citizens who identify with an opposition party to vote for the incumbent (persuasion), we would expect these voters to face stronger incentives to return to their original party in subsequent elections. This issue may provide an interesting starting point for further research.

Conclusion

Dominant theories hold that voters have extremely short-lived memories when it comes to political issues and electoral choice, but we still know little about how quickly electoral rewards for beneficial policies decay over time. Generating better knowledge about this topic is important, because the shortsightedness of myopic voters can induce reelection-seeking incumbents to opportunistically skew policies towards short-term goals. Our study provides a step toward filling this gap. By exploiting the massive policy response to the 2002 Elbe flooding in Germany as a natural experiment, we estimate a temporal response curve that describes how long voters electorally rewarded the incumbent party for its concentrated relief efforts. We find that the short-term rewards to beneficial policy are considerable. Vote shares for the incumbent SPD party increased by 7 percentage points in directly affected areas. We also find that 25% of the short-term reward carried over to the 2005 election. This demonstrates that voter gratitude for large policy benefits can persist several years and perhaps longer than scholarship has acknowledged so far. These long-term electoral gains vanished in the 2009 election, suggesting that seven years after the flood response the incumbent party no longer enjoyed a significant advantage in affected areas.

These findings do not only add to our knowledge about the electoral effects of natural disasters, but also carry implications for our understanding of voter behavior, democratic accountability, and public policy. The strong short-term electoral rewards that we find are consistent with theories of myopic retrospection, which predict that voters will reward incumbents for recent performance in line with the "what have you done for me lately" principle. However, given the emphasis on shortsighted and forgetful voters, these theories also predict that electoral rewards to policy benefits should be very short-lived, and certainly not survive several years. The durability of the electoral rewards we document

[14]We considered whether the policy response affected SPD (single-member district) votes and find that SPD candidates gained about 3.1 [1.9, 4.3] percentage points in flooded districts.

therefore constrain the scope of this theory. Voter gratitude for policy benefits can last longer than we would expect from the myopic voter, at least when it comes to massive policy benefits such the ones we consider here. That said, we stress that our estimates most likely constitute an upper bound of how long-lasting performance rewards can be. The government's disaster relief effort provided large and concentrated transfers right at the end of the electoral cycle and because these policy benefits were both "peak" and "end," they presumably enjoyed an exceptionally positive place in voters' long-term memories. This resulted in exceptionally durable electoral rewards, and contrasts with the extant literature on myopia that has primarily explored how voters respond to overall economic performance, which is often neither as salient nor as attributable as the policy benefits we considered in this study.

Our results also speak to the literature on blind retrospective voting, since we find that the incumbent party experienced strong gains in flooded districts, where it provided massive aid to citizens, and substantial losses in distant, unaffected districts. This indicates that affected voters did correctly attribute responsibility for these policies to the government and rewarded the incumbent for its response instead of blindly punishing government officials for the occurrence of the flooding. Overall, this result about short-term rewards to disaster relief spending is consistent with similar findings from earlier studies in the U.S. context (Chen 2008, 2010; Gasper and Reeves 2011; Healy and Malhotra 2009) and India (Cole, Healy, and Werker forthcoming) and indicates that these findings potentially generalize to disaster events in other countries.

With respect to the implications for democratic accountability in the case of natural disasters, our findings may be interpreted as either good or bad news. On the one hand, voter gratitude for massive relief policies may last longer than myopic retrospection would lead us to expect. Thus, in an ideal case scenario, voters seem to have the potential to remember and reward policy choices that governments made several years ago. On the other hand, this implies that the incentives for policy makers to engage in inefficient disaster relief as opposed to preparedness spending are even higher than previous research suggests (Chen 2010; Healy and Malhotra 2009), because these studies do not take into account the potential long-term electoral rewards to relief spending.

More generally, our results highlight that even under favorable circumstances, policy makers and parties should not expect to earn much credit among voters for policies that date back more than a few years. Even though electoral rewards can last longer than theory and past scholarship suggest, they may still decay too quickly given the decades of constant and far less visible policy efforts required to address challenges like climate change, global poverty, or international financial instability. Against this background, one might even consider our results to tell a cautionary tale. Electoral accountability alone appears ill-suited to properly incentivize policy makers to seek appropriate long-term policy solutions to fundamental long-term economic, financial, and environmental problems. This provides an additional rationale to recent attempts that develop complementary accountability mechanisms (Gersbach and Liessem 2008; Mueller 2007) intended to alleviate some of the deficiencies arising from what Sir Winston Churchill has termed "the worst form of government except all those other forms that have been tried from time to time."

Finally, we would like to note the limitations of the analysis. Our study only considers whether retrospective voting is nonmyopic with respect to exceptionally good performance by the incumbent government. This leaves open the question of whether electoral punishment for exceptionally bad policy performance is as long-lasting. We hope that future research will shed light on this issue. Another fruitful avenue for future research would be to explicitly examine the temporal dynamics that characterize the electoral rewards for other government policies and how the time horizons that voters employ for their retrospective evaluations vary across policy domains. Lastly, while the exact reasons for the rate of decay we find remain beyond the scope of this article, we acknowledge that, apart from the degree of human forgetfulness, many political factors potentially moderate this phenomenon. Elite behavior and the incumbent government's success in persuasively communicating the beneficial consequences of their policy response via the media play a role (Besley and Burgess 2002; Eisensee and Stroemberg 2007). Voters in affected regions could have learned more about the reasons behind the government's policies or found out about adverse side effects. The durability of the electoral rewards for policy benefits may also depend on whether those politicians responsible for past government transfers are no longer in power. Future research may start to analyze how these and other factors moderate the longevity of electoral rewards for government transfers and policy benefits more generally.

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