Media, Demonstrations, and Public Good Delivery: Evidence from World Bank Projects during Natural Disasters*

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Abstract

Media can affect governments and public policy by promoting anti-government demonstrations. Under media pressure, a multitasking government might reallocate effort across tasks, rather than increase the total aggregate, resulting in ambiguous welfare effects. In this paper, I test such a hypothesis using a database of World Bank project indicators, which measures government performance in implementing capital projects. Disasters offer an ideal case study because citizens and the government can differ particularly in their preferences between public capital (reconstruction) and consumption (relief). Therefore, at times of disasters, media might be especially effective in shaping public policy by promoting anti-government demonstrations. Joining capital project indicators with data on disasters, media, and demonstrations, I present the following: (1) within-state variation in floods and media activity for Indian states; (2) within-country variation in disasters and media freedom for 135 countries; (3) a case study using anecdotal and archival evidence on flood response in Ghana, Togo, and Ivory Coast in 2007/2008. In all cases, media activity during disasters is associated with lower capital project performance, higher relief/anti-poverty efforts, and more anti-government demonstrations.

Keywords: Disaster aid; government policy, media; natural disasters
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1 Introduction

Media play a crucial role in empowering modern societies, collecting and distributing news, investigating unclear affairs, and ultimately enshrining transparency and accountability as civic virtues. The economic literature has analyzed and clarified the mechanisms through which the positive effects of media and information operate (Besley and Burgess, 2002; Ferraz and Finan, 2008; Snyder and Strömberg, 2010).[1] At the same time, growing evidence also points to the limits of media in biasing voting (DellaVigna and Kaplan, 2007), delivering nationalistic propaganda (Della Vigna et al., 2014), and supporting ethnic-group intolerance (Yanagizawa-Drott, 2014), etc. However, despite this further evidence, it is still unclear whether and how media can affect governments and public policy in non-election periods.

In this paper, I investigate the influence that media can exert on public policy by promoting anti-government demonstrations. Suppose there exists a multitasking government, which chooses the optimal public policy mix between capital investment k and public consumption c based on some deep preference parameters, shared with its citizens. However, in some periods and for some reasons to be clarified later, there may occur a mismatch in the value of such parameters between the government and citizens. In a theoretical model, I show that media can be particularly effective in periods of preference mismatch, because they can observe all parameters. Therefore, an anti-government demonstration call can be issued by media whenever the benefits for the general public of rebalancing the public good mix exceeds some welfare cost of demonstrating. This keeps the government in check against providing public good mixes that are excessively distant from citizens' own preferences.

Because attaching a welfare figure to media activity during disasters would require considerable assumptions, in this paper I focus only on one margin: the reallocation of effort from one task (capital projects) to another (public consumption). I do not take a clear stance on whether the overall effect of media is positive or negative, but I highlight the fact that the reallocation margin, combined with the increased anti-government demonstrations, is enough to consider the overall effect of media in disasters to be at least ambiguous. This argument is in line with a strand of literature highlighting the possible negative effects of media and information on welfare generated by pandering to citizens.[2]

[1] The economic literature presents a strong positive result on the role of information on public policies, both theoretically and empirically. In the moral hazard interpretation of the incumbent–voter interaction, Hölmstrom (1979) shows that informative signals enhance welfare. On a similar line, Grossman and Helpman (1996) stress the positive effect of information in diminishing special interest politics. As Prat and Strömberg (2011) comprehensively report, many empirical tests have supported this hypothesis. For example, Besley and Burgess (2002) show that government relief spending in India is more responsive to floods in the presence of active media, Ferraz and Finan (2008) show that information promotes electoral punishment for corruption, and Snyder and Strömberg (2010) demonstrate the causal link between media coverage and politicians' committee work.

[2] Maskin and Tirole (2004) show that re-election incentives can encourage politicians to pander to

This research makes two novel contributions. First, I provide a theoretical and empirical test to show the effect of media activity on government effort in the implementation of capital projects, by studying specifically the public response to a disaster. Instead of promoting an improvement in policy along all dimensions, media provoke a redirection of effort away from capital projects to relief projects. This is verified first for the world's largest democracy, India, by studying its within-state changes, and then for a sample of 135 countries and a three-country archival case study. Secondly, I examine empirically a plausible mechanism through which the pressure of media affects public policy (i.e., anti-government demonstrations), as Passarelli and Tabellini (2016) have proposed. I offer a mechanism that recalls their assessment, even though in a reduced form. This is innovative because it shows that citizens, and media, enjoy a variety of tools to influence governments and public policy, with election discipline being only one among several possible.

The ideal experiment to test the main hypothesis requires the following:

1. a shock to the value of public goods, which affects heterogeneously capital investment k and public consumption c, and produces a preference mismatch between the government and citizens;

2. an assessment of governments' capital investment and public consumption actions over these events;

3. a measure of media activity and of anti-government demonstrations.

In order to address the first item, I focus on natural disasters as a shock to the valuation of public capital, as argued by Besley and Persson (2011). At the same time, I highlight the possibility that such shock affects heterogeneously the desired public policy mix of the government and citizens; the economic literature has provided some arguments explaining why governments might be particularly keen on capital investment in the aftermath of an extreme event.[3] Moreover, it is particularly convenient to study disasters, given this setting, because disasters require a rich public policy mix. In fact, after such events,

their electorate and consciously take suboptimal decisions. Prat (2005) distinguishes between the role of information on consequences versus actions: while the first unambiguously benefits voters and screening, the second increases both discipline and selection problems. This is in line with the public administration and sociological organization literature, which is very cautious regarding the role of information provision, especially during extreme events (Quarantelli and Dynes, 1977; Schneider, 1992, 2005). This literature explains such a result through the "bureaucratic versus emerging norms" channel: the media can push the government to follow "ad hoc rules", which address sensational events (emerging norms) instead of proceeding using the usual set of "socially optimal" rules (bureaucratic norms).

[3]There are two arguments that can summarize why this is the case. A benevolent argument (Rogoff, 1990) would state that a disaster, especially if away from elections, might offer a government the opportunity to signal to citizens its competence in steering the economy. The neoclassical growth model predicts that extreme events deplete the capital stock, leading to an exogenously higher return for every unit of invested capital. Therefore, after such events, the government can signal its ability by stimulating investment above what citizens believe necessary, in order to maximize its re-election probability. In a nutshell, the government would over-invest in k compared to c, and find a higher income during the election year,

the government response is generally composed of a "consumption" component, referred to as relief (e.g., supply of clean water, medical assistance, food, etc.), and a "capital" component, referred to as reconstruction (e.g., restoration of infrastructure and services).

In order to address the second item, I exploit information from the World Bank Project Evaluation dataset, which provides an assessment for the implementation effort of the government/borrower (i.e., the borrower performance rating). This is a sensible measure for capital projects effort, given that the World Bank finances primarily capital projects (infrastructure, hospitals, education projects, etc.) and never relief operations, which are funded by other international institutions such as the Food and Agriculture Organization of the United Nations (FAO), the World Food Programme (WFP), and the United Nations High Commission for Refugees (UNHCR). Therefore, I have an assessment by a third-party institution of the performance of government operations in capital projects during disasters. This is a particularly useful indicator, because it allows me to study a relatively comparable set of projects (financed by the World Bank) and to verify what happens to government efforts to implement projects when disasters hit, in the presence of particularly intense media activity. To the best of my knowledge, no previous paper has studied the effect of media on redirecting government effort away from capital projects, and these indicators have never been used to embody government performance. These can be joined with a variety of indicators measuring the extent of relief operations, of media activity, and the number of anti-government demonstrations, as required by the third item.

In this paper, I present the following empirical assessment.

1. The first is a case study on India, focusing on within-state variation for a specific type of disaster (floods) and several measures of media activity (number of newspapers, radios, newspaper circulation, etc.). Besley and Burgess (2002) showed that calamity relief increases in the presence of floods and stronger media activity, so I can focus on showing the "remaining part" of the argument – during these events, government performance in capital projects is lower and political violence is higher.

2. The second is a case study on 135 countries (World), focusing on within-country variation for different aggregate measures of disaster (number of disasters, number of disaster-related casualties, etc.) from the OFDA/CRED International Disaster Database (EM-DAT).[4] In the absence of a reliable panel of media variables, I use the

boosting its re-election probability. A malevolent argument would state that a disaster affects various areas simultaneously and in presence of scarce resources, the government might exploit this opportunity to channel resources to some areas based on special interests (Grossman and Helpman, 1996) or for ethnic reasons (Burgess et al., 2015). These might provide the government with an opportunity to extract rents from the investment decisions, either directly, through monetary payments/bribes, or indirectly, through future campaign donations or co-ethnic support. In either case, a preference mismatch between citizens and the government might be plausible during extreme events.

[4]EM-DAT is maintained by the Centre for Research on the Epidemiology of Disasters (CRED), with support from the Office of Foreign Disaster Assistance (OFDA), at the Université Catholique de Louvain, Brussels, Belgium. See `http://www.emdat.be/`.

time-varying measure of the indicator of media independence, as indicated in the Freedom of the Press data set published by Freedom House, Washington DC.[5] As before, I show that the interaction of a disaster with free media reduces government performance in reconstruction and increases political violence. However, in the absence of cross-country measures of relief spending on the government side, I proxy such a variable through one of its outcomes (i.e., poverty rates). I am able to show that poverty is reduced more quickly in countries that are hit by disasters in the presence of media freedom.

3. The third piece of evidence emerges from an event study on the floods that hit Ghana, Togo, and Ivory Coast in 2007/2008. By using archival data from the World Bank and additional documentation, I can show that the country enjoying a free media (Ghana) spent much more than Togo and Ivory Coast in relief/consumption, and conversely received lower performance ratings in World Bank projects, especially the indicators on government performance.

This paper relates to several growing bodies of literature. First, these results provide new insights into the relation between public policy and media (Besley and Burgess, 2002; Strömberg, 2004; Ferraz and Finan, 2008; Lim et al., 2015; Miner, 2015). Particularly, this paper provides evidence on the "adverse" effects of information on those tasks, such as capital projects, that might be neglected by the government in response to intense media activity. Secondly, this paper relates to the literature on the effects of media on political persuasion and social disorder (DellaVigna and Kaplan, 2007; Della Vigna et al., 2014; Yanagizawa-Drott, 2014; Adena et al., 2015). Specifically, this work shows that media activity can influence public policy through the government anti-demonstration channel. Finally, I contribute to the public administration literature on disaster management and public policy (Schneider, 1992, 2005; Donahue and Joyce, 2001; Garnett and Kouzmin, 2007), by providing an empirical assessment of a well-established theoretical framework, so far mostly documented through anecdotal and archival evidence.

The rest of the paper is organized as follows. In Section 2, I present the theoretical model. In Section 3, I derive the main empirical equations from the theoretical model and establish the basis of the project and country-level evidence. In Section 4, I present the results for India, for 135 countries, and for the case study on Ghana, Togo, and Ivory Coast during the floods of 2007/2008. Several robustness checks are offered in Section 5. I conclude in Section 6.

[5] See `http://www.freedomhouse.org/report-types/freedom-press`.

2 Theory

This model examines the government problem in implementing public projects with multitasking and the decision of a free media to respond to public policies with an anti-government demonstration call. In this context, two players interact: a government G and the media (alternatively referred to as the press) P. The government can produce two public goods, k and c, representing public capital/reconstruction and public consumption/relief, respectively. The media represent citizens and act as a safeguard, calling for an anti-government demonstration when convenient.

The key result of this model states that the observed effort of a government in implementing capital projects increases during a disaster with no media activity more than a disaster with media activity. Conversely, the provision of public consumption goods declines during a disaster with no media activity and less so when media is free/active.

2.1 *Economic Environment*

Nature assigns a state, $\omega \in \{R, D\}$, with R denoting regular and D denoting disaster. G and P value each good 1 in regular times, $\omega = R$, while during a disaster, $\omega = D$, good k is regarded as more important by the government (for simplicity, I assume twice as important). The government values k as $1 + \alpha$, with $\alpha(\omega) \in \{0, 1\}$ and $\alpha(D) = 1$ and $\alpha(R) = 0$. Therefore, in a disaster, there emerges a valuation mismatch between the government and citizens, represented by the media. Note that α enters the final effort levels as a relative parameter between consumption and investment good provision: in terms of preferences, the fact that the government prefers more investment during a disaster is observationally equivalent to citizens preferring more consumption in this event. The model essence is unaltered, as long as there remains asymmetry between the two agents in a disaster.

2.2 *Technology*

2.2.1 *Public Good Production*

The production of the capital good, k, requires $e \in [0, 1]$ units of effort by the government, through a concave technology $k = e^{\gamma}$ with $\gamma \in (0, 1)$, while the consumption good is produced linearly through $c \in [0, 1]$, which embodies the units of effort. The effort cost function expresses the multitasking problem (Dewatripont et al., 2000): it is increasing and convex in the sum of e and c and, for simplicity, takes a quadratic shape.

2.2.2 *Anti-Government Demonstration*

The media can affect government's preferences by calling for an anti-government demonstration, $\sigma \in \{0, 1\}$, where $\sigma = 1$ indicates a call and $\sigma = 0$ its absence. A demonstration forces the government to care less for good k in a disaster, and hence instead of $\alpha = 1$, the government gives to k a weight $a \in (0, 1)$. The demonstration affects government's incremental valuation for good k through the following technology

$$\alpha = 1 - (1 - a)\sigma.$$

Hence, if $\sigma = 0$, then the government keeps its incremental preference, $\alpha = 1$, whereas if there is a demonstration, $\sigma = 1$, then the government compromises its preference to $\alpha = a$ with $a \in (0, 1)$. The demonstration comes at a social cost $\chi(\sigma)$, embodying either the loss of output caused by the demonstration (missed work hours and police activity) or a probabilistic fixed cost that the demonstration might turn violent and subvert the public order, in the spirit of Passarelli and Tabellini (2016), who model demonstration as a tool for political bargaining. Note that a demonstration causes a drop in government's preference for k, from α to $a < \alpha$, which, because of multitasking, leads to more c being produced in equilibrium.

In general, the role of the media can be justified as follows. Citizens observe every event in the economy except a, which is the extent to which they are successful in affecting government's public good valuations. On the one hand, they can be thought of as holding a prior, which always discourages them from taking to the street (e.g., $a \to 1$). On the other hand, citizens are aware that because the media can observe the real a, it is always convenient to demonstrate when $\sigma = 1$. Relying on Besley and Prat (2006), I am implicitly modeling a truthful media, who do not fabricate false signals, are plural and profit-making, and therefore difficult to be captured by the government. Alternatively what is intended as the "media" in this model can be thought of as the share of informed citizens, who observe a and organize a demonstration, when it is worth affecting public policy.

2.3 *Payoff*

The payoff functions of G and P can be described as

$$U_G = (1 + \alpha)e^\gamma + c - \frac{1}{2}(e + c)^2 \tag{1}$$

and

$$U_P = e^\gamma + c - \chi(\sigma) \tag{2}$$

where $\alpha \in \{0, 1\}$ represents the incremental valuation of G for capital k.

The government decides how much k and c to produce by maximizing equation (1) with respect to e and c, while the media choose whether to call for an anti-government demonstration by maximizing equation (2) with respect to σ.

2.4 *Timing*

There are two stages in this game: in the first stage, the media decide whether to call for an anti-government demonstration; in the second stage, the government decides on the effort levels and public goods are produced.

In the first stage, nature determines ω, which affects the government valuation for capital α. This affects the effort levels e and c exerted by the government in its two tasks – which are derived by choosing e and c to maximize equation (1). The media know α and anticipate the government's choice for e and c, and when $\omega = D$, are dissatisfied with the public good mix: given the citizens' and its own preferences during a disaster, there is too much capital and too little consumption. Therefore, the media decide whether to call for an anti-government demonstration, $\sigma \in \{0, 1\}$, where $\sigma = 1$ implies the presence of such a call and $\sigma = 0$ its absence. The media choose whether to call for an anti-government demonstration by maximizing equation (2) with respect to σ, and in doing so, encounter a trade-off. On the one hand, a demonstration narrows the valuation mismatch between G and P, leading to a public good mix that is closer to the optimal for the citizens/media, and yet, on the other hand, it imposes a welfare loss. In terms of exerted effort levels, because of multitasking, the demonstration leads to a drop in the valuation of k, which leads to a lower optimal value of k and simultaneously leads the government to care more for good c.

2.5 *Equilibrium*

Given the two-stage nature of this game, I apply the equilibrium notion of subgame perfection[6].

Proposition 1 *The government optimally chooses the effort levels to exert in each project*

[6]This can be reported for completeness. For each player $i = G, P$, define Z_i as the set of strategies, z_P as the strategy for player P as a mapping from states $\omega \in \{R, D\}$ into its action $\sigma \in \{0, 1\}$, and z_G as the strategy of player G as a mapping from states $\omega \in \{R, D\}$ and the strategy of z_P into actions $\{e, c\}$. Denote z as a profile of strategies

$$z = (z_G, z_P), \qquad z_i \in Z_i, \qquad i = G, P,$$

where z_{-i} indicates the strategy of the other player, and $U_i(z_i, z_{-i}, \omega, v)$ is the payoff of player $i = G, P$ in state $\omega \in \{R, D\}$, given parameters $v = \{a, \gamma\}$. Here, U_i is the payoff specified in equations (1) and (2), conditional on the state assigned by nature, ω, which can be regular R or disaster D. Finally, the vector of parameters v, comprises the post-demonstration government valuation for capital a, and the concavity of the capital good production technology γ. The best-reply correspondence of player i is defined as

$$B_i(z_{-i}) = \{z_i \in Z_i : U_i(z_{-i}, z_i) \geq U_i(z_{-i}, z_i^{'}), \forall z_i^{'} \in Z_i\},$$

depending on the states of nature ω and the parameters a and γ. The effort exerted in capital projects is higher during disasters than regular times, but is lower if a disaster occurs and media calls for a public demonstration. Conversely, the government effort exerted in public consumption goods declines during a disaster, but less if media calls for an anti-government demonstration.

The following inequalities express the previous statement:

$$e^{DN} > e^{DD} > e^{R}; \qquad c^{R} > c^{DD} > c^{DN}.$$

Therefore, the effort e exerted in a capital project increases during a disaster with no demonstration DN, and is larger than a disaster with a demonstration DD, and larger than regular times R. Conversely, the consumption effort c is higher in regular times than in a disaster with a demonstration, and higher in a disaster with a demonstration than a disaster with no demonstration.

The intuition is straightforward: when the government cares more for capital and is free to allocate its effort, DN, then it does so; the demonstration pushes down its valuation on the capital good and hence its effort, DD, and these are above the regular case. Because multitasking is in place, then public consumption behaves in the opposite direction. The full proof is given in Appendix A.

Proposition 2 *The media optimally choose whether to call for an anti-government demonstration, σ, depending on whether the post-demonstration government valuation for capital, a, lies below a threshold τ:*

$$\sigma = \begin{cases} 1 & \text{if } a < \tau \\ 0 & \text{if } a \geq \tau \end{cases} \text{with} \quad \tau = \frac{(1-2^{\gamma})(2\gamma)^{1/(1-\gamma)}}{1-\gamma} - 1.$$

If, after a demonstration, the government lowers its incremental valuation for k from 1 to a and a is low enough, then it is worth demonstrating. The intuition is essential: if the marginal benefits of a demonstration, as measured by the movement of the government away from a more balanced public good provision, exceed the marginal costs of a demonstration, as measured by welfare, then it is worth demonstrating. The full proof is given in Appendix B.

describing $B(z) = B_G(z_P) \times B_P(z_G)$. Then, a profile of strategies $z^* = z(\omega, v)$ is a Nash equilibrium if and only if $z^* \in B(z^*)$, and is subgame perfect if and only if it is a Nash equilibrium in every subgame. Given that all functions are well-behaved, there is an equilibrium in this game and the following two propositions characterize it.

3 Empirical Model

In this section, I present the databases used in this analysis, highlighting in Section 3.1 how these variables map my theoretical model and lead through the empirical section. Subsequently, in Sections 3.2 and 3.3, I derive the empirical equations from Propositions 1 and 2, and I present, respectively, how I test whether effort levels and anti-government demonstrations react to disasters and media.

Because my database rates two agents working on the capital project (i.e., the government and the World Bank), I extend the model presented in Section 2, with a slight modification regarding the production function of good k – instead of just G, now two players are involved, the government G and the World Bank W, with the production function becoming super-modular in their effort levels, $k = e_W^{1-\gamma} e_G^{\gamma}$. Such complementarity leads to the same results as in Proposition 1, with an expected insight: the World Bank's effort choice follows exactly the same pattern as the government's. This update of Proposition 1 is shown in Appendix C.

3.1 Data and Identification

The World Bank Project Rating database ("IEG historical project evaluations") is a collection of project ratings that have been assigned by World Bank managers to almost all financed projects since the early 1970s. It is important to recall that the World Bank does not finance relief or food aid; it provides over 90% of its budget for capital projects (transportation, energy, hospitals, etc.) and the remaining 10% goes to government budget support. Among several indicators, I focus on the three that permit me to test my predictions – project outcome, borrower/government performance, and bank performance – which I use as measures of k, e_G, and e_W, respectively. The evaluation body of the World Bank (i.e., the Independent Evaluation Group[7]) defines such ratings as follows.

Project outcome is "the extent to which the operation's major relevant objectives were achieved" – a synthetic measure of project success, k.

Borrower performance is "the extent to which the borrower [...] ensured quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development outcomes" – a synthetic measure of government implementation performance, e_G.

Bank performance is "the extent to which services provided by the Bank ensured quality at entry [...] and supported effective implementation through appropriate supervision, [...] toward the achievement of development outcomes" – a synthetic measure of bank supervision performance, e_W.

[7]See `http://ieg.worldbank.org/Data/HarmonizeEvalCriteria.pdf`.

These evaluations are carried over by World Bank project managers and moderated within teams; each indicator is the result of different subratings, which are separately scored for every individual project and collected in the Implementation Completion Report".[8] Overall, these ratings result in a six-scale measure ranging from highly unsatisfactory (1) to highly satisfactory (6). In the analysis presented in this paper, I do not dichotomize the variables, following Denizer et al. (2013); however, as a robustness check, I proceed with an above/below median dichotomization, which does not affect my results.

Because my explanation relies on a multitasking story, I capture a measure of relief/public consumption in the available data, to test my mechanism. In the following two subsections, I describe the specific data for each case study, with special reference to data on the additional task.

India Case Study

In this case, I study the effect of floods and media activity within Indian states. The work by Besley and Burgess (2002) contains evidence that relief increases in states where media are more active, while I focus on the other side of my explanation and study the effect of floods and media on World Bank project performance – especially borrower/government performance – and on political violence. This is possible by combining World Bank data, with the Economic Organization and Public Policy Program (EOPP) on Indian States, media, calamity, and socioeconomic indicators used by Besley and Burgess (2002), and with data on political violence in Indian States used by Urdal (2008). The measure of disaster that I use in the Indian case study is very sharp: the area (in million hectares) involved in a flood (called the flood area). Overall, my database presents 261 projects; however, my sample is composed of roughly 130 projects for 15 states[9] that present the required government performance rating and flood/media variables.

World Case Study

In this case, I study the effect of disasters and media freedom within countries. Instead of relying on flood data, which are not very detailed across countries, I measure the number of disasters and disaster-related casualties, available through the EM-DAT database. Instead of media activity variables, I use a binary indicator for media independence, as published by Freedom House, taking unit value if a country is classified as free, and zero if partially free or not free. Cross-country political violence variables are available from Banks and Wilson (2015). Because there is a lack of relief-spending variables operated by

[8] Just for reference, project outcome accounts for relevance, efficiency, and efficacy, borrower performance accounts for compliance and implementation, and bank performance accounts for quality at entry and supervision.

[9] The states used in this work are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh, and West Bengal.

the government (not by aid agencies), I do not have access to a measure of "relief input". For this reason, I proxy this with a "relief output" (i.e., poverty rates, which are available from the World Development Indicators[10]). In addition to these datasets, I also use macro controls (such as population, GDP per capita, etc.) from the Penn World Tables (Heston et al., 2012). Overall, my database presents 8,567 projects; however, my sample is composed of only 4,351 projects for 135 countries that present the government performance rating and observations recorded in the EM-DAT database and Freedom House indicators. In my analysis, I focus simply on three measures of disaster, as follows.

"Number of disasters" is the sum of natural disasters occurring in a country in a given year.

"Number of casualties" is the sum of disaster-related casualties occurring in a country in a given year.

"Disaster 90 (or 80, 70)" is a country/time-varying dummy variable, taking unit value if a country in a given year exceeds the 90th (or 80th, 70th) percentile in both the number of disasters and number of casualties – this is a proxy for extreme events.

3.2 Project-Level Evidence

I estimate three equations for project implementation: project outcome, borrower performance, and bank performance. I define the government effort gap in a disaster with no demonstration, $\triangle e_G^{DN}$, as the difference in the government effort level for good k during a disaster without demonstration minus the outcome of a project in the regular case. Analogously, $\triangle e_G^{DD}$ represents the same gap, with reference to a disaster with a demonstration. Appendix C reports the simple computations of e_G^{DN}, e_G^{DD}, and e_G^{R}, presented here:

$$e_G^{DD} = \left[\frac{2\gamma(1+a)}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)};$$

$$e_G^{DN} = \left[\frac{4\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)};$$

$$e_G^{R} = \left[\frac{2\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)}.$$

Therefore, it follows that

$$\triangle e_G^{DN} = e_G^{DN} - e_G^{R} = \left[\frac{2\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)} 2^{(1+\gamma)/(1-\gamma)} \quad (3)$$

[10] See `http://data.worldbank.org/data-catalog/world-development-indicators` for 2013.

and

$$\triangle e_G^{DD} = e_G^{DD} - e_G^R = \left[\frac{2\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)} \left[(1+a)^{(1+\gamma)/(1-\gamma)} - 1\right], \quad (4)$$

recalling that $a \in (0,1)$. Then, this implies that $\triangle e_G^{DN} > \triangle e_G^{DD}$, and the following difference-in-difference model describes an encompassing effort gap model:

$$e_{Gjist} = b_i + b_s + b_t + b_1 D_{it} + b_2 D_{it} \cdot F_{it} + b_3 F_{it} + X_{it}^{'} b_4 + u_{Gjist}. \quad (5)$$

Here, D_{it} and F_{it} describe a measure of disaster and a measure of media activity, respectively, in country/state i at time t. The left-hand side variable, e_{Gjist}, reports the effort level of the government in project j, country/state i, sector s at year t. This depends positively on whether there was a disaster in country/state i at year t, $b_1 > 0$, and negatively on the interaction between the disaster and media activity, $b_2 < 0$. In this expression, I am implicitly assuming that through country, sector, and year fixed effects I am expressing the effort of regular times, so that my fixed effect estimator indeed catches the effort gap equations (3) and (4).

Analogously, I present a similar model for project success k and bank effort e_W:

$$k_{jist} = a_i + a_s + a_t + a_1 D_{it} + a_2 D_{it} \cdot F_{it} + a_3 F_{it} + X_{it}^{'} a_4 + u_{Yjist}; \quad (6)$$

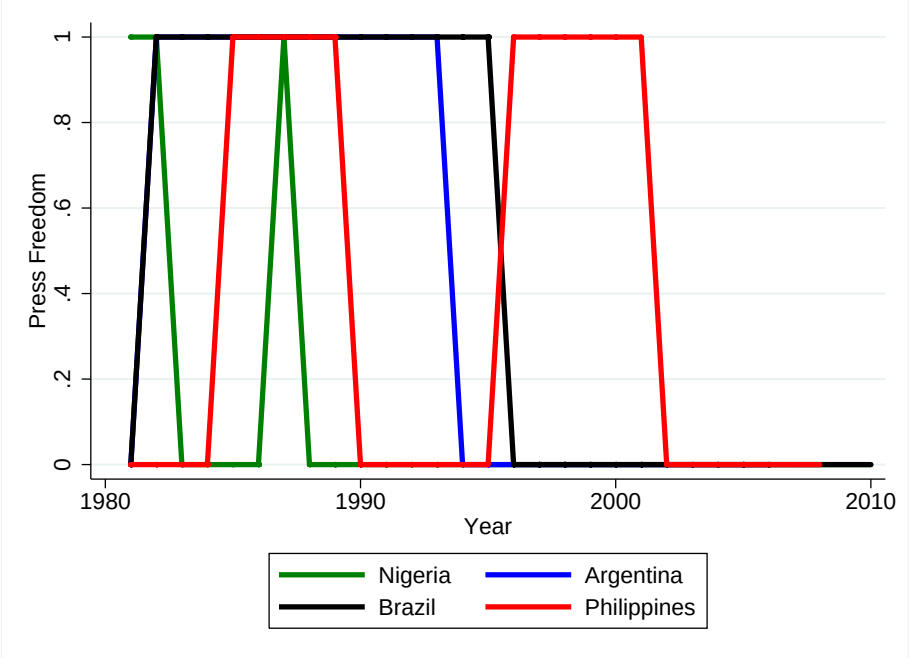
$$e_{Wjist} = c_i + c_s + c_t + c_1 D_{it} + c_2 D_{it} \cdot F_{it} + c_3 F_{it} + X_{it}^{'} c_4 + u_{Wjist}. \quad (7)$$

The previous theoretical model predicts that shocks to α for the government also map the success of capital project k_{jist} and bank performance e_{Wjist}. Therefore, Proposition 1 predicts that a_1 and c_1 are positive and that a_2 and c_2 are negative. In general, no prediction is expressed for a_3, b_3, and c_3.

My identification relies on shocks for India and within-country variation for the second 135 country-panel. Specifically, I exploit the effect of disasters on project performance within a country, when a state increases its media activity in India or switches between free and not free/partially free media. Several of these changes are in place, as Figure 1 shows for Nigeria, Argentina, Brazil, and the Philippines. A careful description of the disaster variables reported by the EM-DAT was reported by Strömberg (2007).

The assumption that a shock to the valuation of public goods affects projects only through performance would be misleading if some projects were approved because of a disaster. Hence, a selection bias would be present: special projects are approved in extreme events and are non-comparable to regular times. Thus, I would be measuring a difference between different types of projects overall. However, this claim might not apply for two reasons. (1) There exists a specific classification of projects designed in the

Figure 1: Switches in Media Freedom: Selected Countries



Note: This figure reports the time series variation for switches in media freedom for Nigeria, Argentina, Brazil, and the Philippines. The x-axis is time and the y-axis is the indicator of media independence published by Freedom House for the selected countries. The identification strategy used in the panel for 135 countries relies on the interaction between these changes and the disasters that occur in a given country. For Nigeria, it can be clearly seen that there is a period of media freedom in the early 1980s, with a definitive drop in the 1990s, since when the country has been classified as partly free. Argentina and Brazil have been free since the mid-1990s, after which it has been consistently classified as partly free. The Philippines enjoyed some moments of media freedom in two periods 1985–1991 and 1995–2002, but excluding these it is classified as partly free.

presence of natural disasters, so-called "emergency projects",[11] which are few (118) and can be controlled for, mainly because the World Bank does not follow disaster assistance, but rather post-disaster reconstruction. (2) Project preparation is generally long, requiring on average between two and three years, and is strongly responsive to political economy determinants (UN security council, UN voting pattern, US foreign policy) rather than project-specific variables, as Kilby (2013) describes.

3.3 Country-Level Evidence

Using Proposition 2, I describe the variables taken into consideration by the media when calling for an anti-government demonstration. The threshold strategy leads smoothly to the empirical model. Suppose that, similarly to the previous section, a signal $\sigma_{it} = 1$ i

[11] These are clearly recognizable because they are labeled "emergency projects". In order to be classified as such, they must comply with the World Bank Manual "OP 8.00 – Rapid Response to Crises and Emergencies", which describes these projects as those that "address major adverse economic and/or social impacts resulting from an actual or imminent natural or man-made crisis or disaster".

sent by the media in country/state i at year t

$$\sigma_{it} = \begin{cases} 1 & \text{if } a_{it} < \tau + u_{it} \\ 0 & \text{if } a_{it} \geq \tau + u_{it} \end{cases},$$

following the same structure as before, plus an additive error term u_{it} distributed with CDF $L(u_{it})$. Then, it follows that

$$Prob(\sigma_{it} = 1) = 1 - L(u_{it} \leq a_{it} - \tau).$$

The extent to which media can reduce the government's valuation for capital projects in a disaster, a_{it}, can be larger when media presence is stronger (and hence positive if media is free, and zero otherwise). Therefore, the larger the disaster in the presence of an active media, the larger the probability of conflict. The theoretical content expressed in Proposition 2 can be described through the following equation

$$Prob(\sigma_{it} = 1) = d_i + d_t + d_1 D_{it} + d_2 D_{it} \cdot F_{it} + d_3 F_{it} + X_{it}^{'} d_4 + u_{Dit}, \tag{8}$$

where the theory predicts that d_2 is positive and significant, because in the presence of a disaster (valuation mismatch) and free media, an anti-government demonstration is called. However, Proposition 2 delivers no predictions on d_1 and d_3, which might include other channels.

4 Results

4.1 Results Within States for India

Tables 1 and 2 provide an empirical assessment of the theory previously presented. Table 1 reports the regressions of project outcome, borrower performance, and bank performance on flood area, and a measure of the number of newspapers, weighted by population density. Comparing Columns (1)–(3) with Columns (4)–(6), clearly there emerges an important role for the interaction between flood and media: the point estimate of the flood variable increases five to seven times, and the interaction term between flood and media is always negative and significant for borrower and bank performances. These two results confirm an assumption and a proposition of the underlying theoretical framework: first, disasters represent a shock to the valuation of capital goods, as assumed, and this is the reason for the positive and significant sign of the flood variable; second, the role of the media on government effort choice is central, as highlighted by Proposition 1, and, in fact, omitting this interaction affects importantly the main estimates (i.e., for the case of capital projects, the impact of this interaction is negative and strong). Table 2 presents some evidence

Table 1: India: Floods and Media – OLS (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Flood	−0.0626	0.125	0.0629	0.124	0.778**	0.582*
	(0.0775)	(0.208)	(0.179)	(0.378)	(0.275)	(0.325)
Flood × No. of Newsp.				−3.84e-05	−0.0001**	−0.0001*
				(6.35e-05)	(5.83e-05)	(5.68e-05)
No. of Newsp.	−0.000649	0.000231	0.000343	−0.000593	0.000431	0.000498*
	(0.000413)	(0.000299)	(0.000256)	(0.000477)	(0.000385)	(0.000280)
Mean Dep. Var.	4.312	4.060	4.286	4.312	4.060	4.286
Observations	132	132	132	132	132	132
R^2	0.473	0.391	0.470	0.474	0.408	0.484

Note: The unit of observation is project level, and there are state, sector, and year fixed effects. Standard errors clustered at state level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank). These are interpreted as measures of effort levels and project success. All are measured in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. Project performance is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

on a channel through which media can affect government decision-making (i.e., anti-government demonstrations). A variable of political violence for Indian states is regressed over floods, media, and the interaction between these two. As predicted by Proposition 2, the interaction between these two variables is positive and significant.

In Section 5, I employ different measures of media for Table 1 (i.e., the number of newspapers, unweighted; newspaper circulation, etc.), and I provide some placebo checks on Table 2, showing that only political violence increases and not other variables (such as violent conflict, Hindu–Muslim fights, political violence in neighboring states). In all of these checks, the main message is unaffected.

These results, coupled with the work by Besley and Burgess (2002), which shows that relief increases in the presence of floods and media activity, are in line with the theoretical results of Propositions 1 and 2.

4.2 Results within-country for the World

In Tables 3–5, I extend the previous analysis to a sample of 135 countries and study the within-country variation. In Table 3, I study the effect of disasters and media freedom on project outcome, borrower performance, and bank performance. Analogously to Tables 1 and 2, two findings emerge: (1) once introduced, the interaction between disaster

Table 2: India: Floods and Media – OLS (No Controls)

Variables	Political Violence				
	(1)	(2)	(3)	(4)	(5)
Flood	−0.0841**	−0.156**	0.0256	−0.0506	−0.0437
	(0.0364)	(0.0637)	(0.118)	(0.0342)	(0.0350)
Flood × Media	0.08***	0.0363***	0.717	0.03***	0.0002***
	(0.01)	(0.00735)	(0.648)	(0.009)	(5.69e-05)
Media	−0.217	−0.0640	−2.730	−0.006***	−0.0003*
	(0.129)	(0.0746)	(1.630)	(0.003)	(0.0001)
Media	No. of Newsp.	AIRs	No. of Daily Newsp.	Newsp. Circ.	No. of Newsp. Adj. Pop. Dens.
Observations	491	197	148	519	491
R^2	0.311	0.431	0.419	0.301	0.309

Note: The unit of observation is at state level, and there are state and year fixed effects. Standard errors clustered at state level are shown in parentheses. Political Violence reports an annual count measure of "political violent events", and Urdal (2008) states that these "encompass forms of political violence that are less organized (than Armed Conflicts) like inter-communal violence, political assassinations, and rioting". Political violence is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Beyond the number of newspapers, I also use alternative media variables: number of newspapers not adjusted by population density, the number of all-India Radio (AIR) stations, the number of daily newspapers, and a measure of newspaper circulation in the population. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

and media, the impact of disasters on government performance (and project and bank performances, to a lesser extent) becomes positive and significant; (2) the interaction between disaster and media is negative and significant as Proposition 1 states and, once again, the omission of this variable affects centrally the point estimate of a disaster per se. In Table 4, I verify whether anti-government demonstrations can represent a plausible channel through which media affect government public good provision. Therefore, I regress a measure of anti-government demonstrations on disasters, media, and their interaction. Consistently with Proposition 2, I observe that anti-government demonstrations do increase in the presence of disasters and a free media.

For India, I relied on the literature to show that in the presence of a disaster and an active media, one government task is performed more (consumption) and another consequentially less (capital). Now, for the World, I lack access to reliable input measures of food aid distribution at government level, and therefore I proxy an input (food aid) with an output (poverty rates). In Table 5, I regress poverty rates over disasters, media, and their interaction. Despite the small number of observations, the interaction between media and disasters is negative and, for some indicators, significant. This is not a direct test of my empirical implication, but still it is puzzling to imagine the reason why poverty rates should decline faster in countries hit by a disaster and having a free media, excluding

Table 3: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0123	0.0262***	0.00955	0.0129	0.0287***	0.0116*
	(0.00897)	(0.00671)	(0.00704)	(0.00892)	(0.00622)	(0.00625)
No. of Disasters × Free Media				−0.00780	−0.0316**	−0.0253*
				(0.0131)	(0.0158)	(0.0146)
Free Media	−0.0630	0.0558	−0.0286	−0.0294	0.192*	0.0802
	(0.101)	(0.0899)	(0.0879)	(0.129)	(0.114)	(0.105)
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.117	0.108	0.083	0.117	0.109	0.084
Panel B						
Disaster Type	0.0147	0.0132	−0.0132	0.428***	0.357**	0.257*
	(0.0129)	(0.0142)	(0.0111)	(0.138)	(0.141)	(0.149)
Disaster Type × Free Media	−0.0441**	−0.0473*	−0.0364*	−0.532*	−0.790***	−0.644
	(0.0208)	(0.0270)	(0.0194)	(0.288)	(0.254)	(0.465)
Free Media	0.101	0.241*	0.122	−0.0841	0.0490	−0.0267
	(0.112)	(0.142)	(0.116)	(0.104)	(0.0894)	(0.0868)
Disaster Type	No. Casualties	No. Casualties	No. Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.120	0.107	0.085	0.120	0.107	0.084

Note: The unit of observation is project level, and there are country, sector, and year fixed effects. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called "Disaster 90" (80/70), which is defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed, as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 4: World: Disasters and Media – OLS (No Controls)

Variables	Anti-Government Demonstrations				
	(1)	(2)	(3)	(4)	(5)
Disaster Type	0.023	−0.032	−0.421	−0.151	−0.236*
	(0.051)	(0.022)	(0.313)	(0.167)	(0.139)
Disaster Type × Free Media	0.227	0.176	1.129*	0.681	0.578*
	(0.150)	(0.123)	(0.645)	(0.508)	(0.323)
Free Media	−0.383	−0.456	−0.0260	−0.0749	−0.112
	(0.369)	(0.298)	(0.321)	(0.316)	(0.314)
Disaster Type	No. of Disasters	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	0.714	0.714	0.714	0.714	0.714
Observations	1,774	1,774	1,774	1,774	1,774
R^2	0.295	0.287	0.282	0.283	0.283

Note: The unit of observation is at country level, and there are country and year fixed effects. Standard errors clustered at country level are shown in parentheses. The table reports anti-government demonstrations, described by Banks and Wilson (2015) as "any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature". The left-hand side variables are regressed over a measure of disaster and media freedom. Number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. Number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events I also define a dummy variable called "Disaster 90" (80/70) defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of killed people as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

the channel of more public food provision. Therefore, this provides further support for Proposition 1, even though in a weaker fashion.

4.3 Floods in Ghana, Togo, and Ivory Coast during 2007/2008

In order to provide some further evidence regarding the previous results, I present a short anecdotal and archival case study joining sources from media, newspapers, and World Bank project documentation on a particular disaster (floods) in three neighboring countries in West Africa.

Ghana, Togo, and Ivory Coast are neighbors, all with a very low income per capita (500, 400, and 900 US dollars, respectively, in 2005), that were hit by a series of destructive floods in 2007/2008,[12] as Figure 2 shows with a satellite picture. The common cause for such an extensive natural disaster was abundant rainfall and the release of massive water flows from Burkina Faso's dams upstream, which intensified the disaster in the

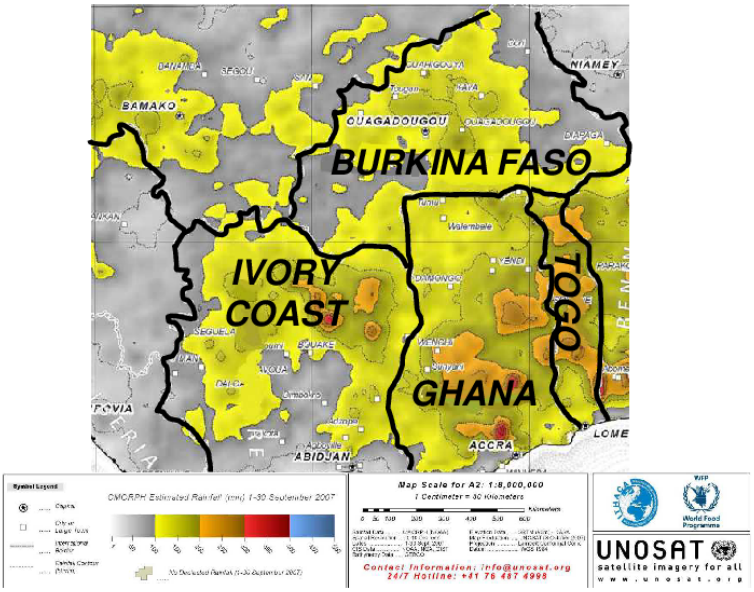
[12]Refer to BBC News articles: "Floods devastate northern Ghana", 15 September 2007 (`http://news.bbc.co.uk/1/hi/6996584.stm`) and "African floods prompt aid appeal", 21 September 2007 (`http://news.bbc.co.uk/1/hi/world/africa/7005969.stm`).

Table 5: World: Disasters and Media – OLS (No Controls)

Variables	Poverty Headcount			Poverty Gap		
	National	Urban	Rural	National	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty Rates						
No. of Disasters	−0.314	−0.211	−0.341**	−0.151	−0.117	−0.151
	(0.196)	(0.207)	(0.169)	(0.128)	(0.0987)	(0.151)
No. of Disasters × Free Media	−1.085	−1.967	−1.443	−0.0865	−0.508***	−1.149***
	(1.234)	(1.444)	(1.704)	(1.167)	(0.0987)	(0.151)
Free Media	−5.859	4.435	−5.749	−3.038	−2.800***	−6.527***
	(4.951)	(9.731)	(6.313)	(4.646)	(0.148)	(0.226)
Observations	227	205	191	90	79	79
R^2	0.878	0.855	0.910	0.919	0.901	0.889
Poverty Rates, Casualties						
No. Casualties	0.383	0.883	0.0821	0.00900	0.103	0.0600
	(0.547)	(0.571)	(0.630)	(0.351)	(0.248)	(0.497)
No. Casualties × Free Media	−0.994	0.126	−1.341	−5.641***	−2.574***	−5.200***
	(0.611)	(1.058)	(1.857)	(1.318)	(0.248)	(0.497)
Free Media	−6.338	−0.695	−5.756	15.25***	6.264***	11.69***
	(5.434)	(12.14)	(10.81)	(4.580)	(0.813)	(1.627)
Observations	211	190	176	77	65	65
R^2	0.872	0.844	0.906	0.919	0.912	0.913
Poverty Rates, Extreme Events						
Disaster 70	−0.518	0.430	−0.210	0.297	−0.118	1.173
	(2.811)	(2.439)	(3.147)	(1.595)	(1.209)	(1.931)
Disasters 70 × Free Media	1.896	1.474	4.917	−0.324	−2.382*	−6.373***
	(4.381)	(4.401)	(5.613)	(5.176)	(1.209)	(1.931)
Free Media	−10.06**	−0.873	−10.98*	−3.245	−3.250***	−7.600***
	(4.633)	(8.953)	(5.917)	(4.206)	(0)	(0)
Observations	207	187	173	76	65	65
R^2	0.873	0.851	0.908	0.914	0.911	0.915

Note: The unit of observation is at country level, and there are country fixed effects. Standard errors clustered at country level are shown in parentheses. Here, I use poverty measures as proxy for relief spending. The National Poverty Headcount measures the poverty rate as the percentage of the population living below the national poverty line; national estimates are based on population-weighted subgroup estimates from household surveys. The Urban and Rural Poverty Headcount replicate the same measure but with the urban and rural poverty lines, respectively. The National Poverty Gap measures the mean shortfall from the poverty line (counting the non-poor as having zero shortfall) as a percentage of the national poverty line; this measure reflects both the depth of poverty and its incidence. The Urban and Rural Poverty Gap replicate the same measure but with the urban and rural poverty lines, respectively. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events I also define a dummy variable called "Disaster 90" (80/70) defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of killed people as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. In the bottom panel, for extreme events, I use Disaster 70, instead of 90, because given the small number of observations there are no Disaster 90 events included. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Figure 2: Floods in Ghana, Togo, and Ivory Coast during 2007/2008



Note: This figure reports the extent of the floods that hit West Africa, particularly Ghana, Ivory Coast, and Togo in 2007/2008; the source is the United Nations Operational Satellite Applications Program (UNOSAT). The areas in yellow and orange are those most hit by floods, and within these areas the dark red dots show those with the hardest floods (mainly northern Ghana, Togo, and Ivory Coast). For most cases, severe floods emerge in the proximity of rivers, lakes, natural reservoirs, and artificial dams.

three downstream countries. As Freedom House reports for Ghana, the "situation deteriorated further when neighboring Burkina Faso opened a dam to relieve pressure from the floodwaters".[13]

These countries share many cultural features, belong to the Economic Community of West African States (ECOWAS) and, until 2007, they presented young democratic institutions – Ghana subsequently continued to exhibit democratic institution and confirmed itself as a distinct success story. One important difference between these countries lies in the status of the media at the time of the disaster: Ghana enjoys a fully free media, while Togo and Ivory Coast only partially free (as classified by Freedom House).

First, I describe the flood response efforts of these governments, as characterized by media accounts, and then I show evidence that, consistent with the theoretical model presented in Section 2, the only country with a free media (Ghana) performed much worse than usual during this disaster. From World Bank project documentation, there is evidence that resources from a World Bank project (conditional cash transfer to vulnerable people) were redirected to flood-hit areas in the form of relief. This provides a tangible recognition of the theoretical channel described above.

As several local and international newspapers reported, Ghana's government pledged and effectively spent considerable resources in post-flood relief. The UN Office for the

[13]Refer to `http://www.freedomhouse.org/report/freedom-world/2008/ghana#.U6f59BB5HTo`.

Coordination of Humanitarian Affairs states that around seven million US dollars were spent on urgent relief operations, and almost 60 million US dollars in the following years.[14] Bussel (2013) points out that media supported the relief effort: "Ghanaian public perceives the national disaster management body to be a source of relief and supplies in the wake of natural disasters and has responded positively to these actions".

However, Bussel also shows that little has been done on the other side of the border so far: "in Togo [...] the quality of the bureaucracy seems to be less of an issue than the lack of funding for disaster-related programs in general. As one interviewee noted, there is little corruption in the disaster management arena at least in part because there is no funding from which administrators could skim".

Similarly, Ivory Coast invested little, if anything, and indeed there is ample evidence that most relief activities were left in the hands of local non-governmental organizations (NGOs) and international authorities.[15]

Both panels of Figure 3 describe the other side of the medal: Ghana, plausibly because of the floods and the strong relief effort related to its free media, underperformed in World Bank projects for the 2007/2008 year; while Togo and Ivory Coast seem to be unaffected by this. My narrative explains this gap by the role of media freedom, which diverted effort from capital projects to relief operations in Ghana, but not in Togo and Ivory Coast. Specifically Figure 3 reports two pictures: in the left one an average measure of performance by the governments of Ghana (solid line), Togo (dashed) and Ivory Coast (dotted) in all World Bank projects implemented in those countries between 1998 and 2008; in the right one a measure of average success of World Bank projects. In both cases it is clear that, while Ghana's government performance and projects success drops in the aftermath of such disasters, those of Togo and Ivory Coast remain largely unaffected.

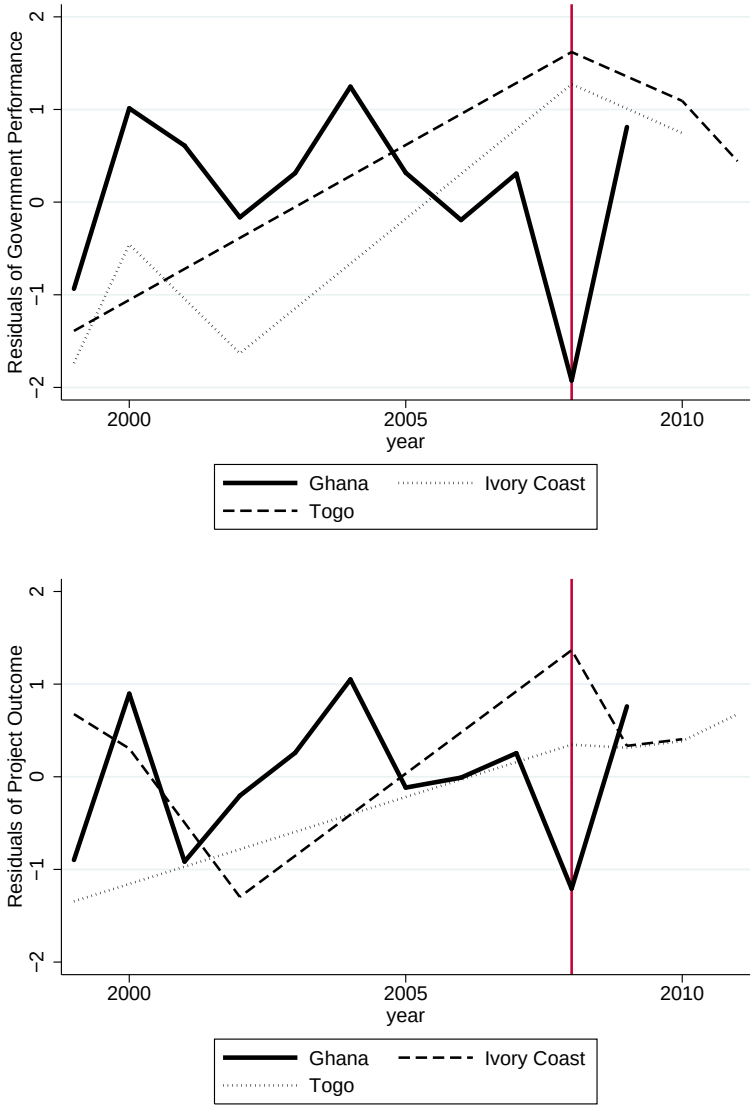
The "effort reallocation" effect of floods on Ghana's capital project performance can be sensed by analyzing the World Bank documentation of a project implemented in this country in 2007/2008.[16] This intervention aimed at financing an integrated plan to address several human capital/poverty initiatives, among which a conditional cash transfer called LEAP (Livelihood Empowerment Against Poverty) aimed at "supporting the vulnerable and the excluded (e.g., the homeless, orphans, street children)". The report highlights that

[14]Refer to the following article by IRIN, the humanitarian news service of the UN Office for the Coordination of Humanitarian Affairs, http://www.irinnews.org/report/74278/ghana-nearly-275-000-affected-by-floods-in-little-known-disaster, and to the Environmental Protection Agency (EPA) of Ghana and United Nations Development Program Policy Advice Series No:3, "Disaster Risks are an Increasing Concern for All", available at https://www.undp-aap.org/sites/undp-aap.org/files/PAS%203%20Disaster%20Risk%20Reduction.pdf.

[15]Refer to the IRIN article, "Flood damage could slow identification process in north", 17 September 2007 (http://www.irinnews.org/report/74326/cote-d-ivoire-flood-damage-could-slow-identification-process-in-north).

[16]Refer to the Implementation and Completion report for project P103631, available at http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/06/09/000333037_20100609031507/Rendered/PDF/ICR14990P095731IC0disclosed06181101.pdf.

Figure 3: Floods, Capital Projects, and Free Media



Note: This figure shows the evolution of the residual of government performance (top panel) and project outcome (bottom panel) of World Bank projects for three countries Ghana (solid line), Ivory Coast (dashed), and Togo (dotted) between 1998 and 2010. Such residuals come from a regression where country and year fixed effects are removed. The vertical line indicates the year in which the three countries experienced an intense flood. The solid line is for Ghana, which enjoyed a free media during that time, as classified by Freedom House; Ivory Coast and Togo, shown by dashed and dotted lines, respectively, are classified as having either partially free or not free media. Government Performance and Project Outcome report the average country-year rating assigned by World Bank project managers to the performance of a government in implementing a certain project and to the overall success of the project itself, respectively; these are interpreted as measures of government capital project effort and project success. Both are measured in continuous units (between one and six, because these are country-year means). It is possible to see that the residual of government performance and project outcome for Ghana (solid line) lies generally above Ivory Coast (dashed) and Togo (dotted) until 2008, when all countries (neighboring) are hit by a series of disastrous floods. While Ghana's performance drops sharply, that of Ivory Coast and Togo seems unaffected, which might be connected with media freedom, which is the case in Ghana but not in Ivory Coast or Togo.

"the number of households receiving grants under the Livelihood Empowerment Against Poverty (LEAP) conditional cash transfer program targeted to the extreme poor reached more than 8,000 households in 2008, up from 2,000 in the regular program in 2007". It also acknowledges that "it is difficult to determine whether these additional transfers were made to regular LEAP program beneficiaries (or) emergency, sometimes poorly targeted, transfers, however". Only in a footnote is it explicitly stated that project funds were redirected from their official scope (a vulnerable-specific CCT) to finance post-flood relief: "6,000 households were benefiting from the LEAP on an emergency basis in response to the 2007–08 floods in northern Ghana".[17]

In conclusion, all the additional households included in the LEAP program between 2007 and 2008 were "poorly targeted" and went to residents in the flooded areas, showing that the poor performance of Ghana's government in World Bank project performance is indeed associated with redirecting resources away from a human capital project to relief.

5 Robustness Checks

The nature of the empirical model, the data (evaluation ratings), and the organization of the analysis may spark some questions regarding the robustness of this work and whether the previous results depend on some unstated assumptions. The following robustness checks are performed.

- Robustness to Controls. The analysis presented in Tables 1–5 is conducted in the absence of controls for macroeconomic and country–time varying indicators. This can generate a classic omitted variable bias (OVB) if the interaction between the disaster and media variables correlate with the missing variable. For this reason, in Appendix D, I report the previous analysis including a series of macroeconomic and country–time varying controls.

- Robustness to Alternative Media Indicators. In Tables 1–5, the main results were obtained by using two measures of media activity: the number of newspapers adjusted by population density for India, and a free media dummy for the World. In Appendix E, I check the robustness of the previous results using alternative media indicators.

- Robustness to the Alternative Clustering of Standard Errors. In Appendix F, I present the results of Tables 1–5 by introducing two alternative ways of clustering the standard errors. Because the number of clusters in India is low (15), I propose two ways to address this: (1) cluster at state–year level, which raises this to 100

[17] Refer to page 61 of the document linked in the previous footnote, the paragraph on "Social Development", and footnote 46 of that page.

clusters; (2) adapt the biased-reduced linearization (BRL) following Bell and McCaffrey (2002), Angrist and Pischke (2009), and Imbens and Kolesar (2012). For the World sample, I adopt a jackknife estimation, which is a procedure analogous to the bootstrap method, in which I replicate each regression n times (where n is the number of observations), leaving out one observation at every iteration. In both cases, my results are in line with the main tables.

- Placebos and Alternative Scenarios for Political Violence. A key piece of evidence in the text is given by the result on the increase in anti-government demonstrations during a disaster in the presence of a strong/free media. However, it could be thought that during extreme events all indicators of political violence show an increase and that, by cherry picking one indicator (i.e., anti-government demonstrations) I am selecting one of several growing variables. For this reason, in Appendix G, I replicate the same analysis using alternative indicators of violence and crime (i.e., guerrilla, Hindu–Muslim conflict, revolutions) and find no evidence of an increase in any of these during a disaster in the presence of a free/strong media.

- Robustness to Alternative Institutional Measures. Because the cross-country analysis described in Tables 3–5 describes the interaction of changes in disasters with changes in media freedom, it might be plausible that changes in such an indicator simply pick up changes in other institutional variables. For this reason, in Appendix H, I repeat the cross-country analysis performed in Tables 3–5, and replace the Free Media dummy with two "institutional measures": in Table D1, a dummy for parliamentary democracy, and in Table D2, a dummy for countries with high constraints on the executive, in the spirit of Besley and Persson (2011). I do not find any evidence of the same effects as shown in Tables 3–5.

- Within-Capital Effort Reallocation. As a further check on my theory, I test whether an effect similar to the between-task reallocation also occurs within tasks. From the sector data, I can reclassify whether a project belongs to the infrastructure sector, economic policy, or human capital (health and education mainly). If within-task reallocation also occurs, I would expect effort to be redirected from infrastructure and economic projects, to human capital projects (analogous to reallocation from k to c). This is what I test in Appendix I, where I run the same regressions presented in Table 3, but I test the triple interaction of disaster with free media and human capital sector. I find that while the interaction of disaster and free media and infrastructure/economic projects is negative and significant, the estimate for the same interaction for human capital is not.

- Robustness to the Evaluation Measure. In Appendix J, I check the robustness of the evaluation measure given by the World Bank, by introducing two alternative

checks. In Table J1, instead of using an indicator of project success ranging between 1 (measuring a highly unsatisfactory rating) and 6 (a highly satisfactory rating), I dichotomize this to a dummy variable and consider a project successful if it achieves a rating above the median. In Table J2, I account for the possible bias introduced by the person in charge of the project, and among its possible final evaluators, by introducing a fixed effect for the evaluators of projects. In both cases, the results are not challenged by this.

- Robustness to the Method. Given the multinomial nature of the World Bank ratings used, the adoption of ordinary least-squares as a statistical device gives rise to some advantages as well as problems. The advantages are mostly in the ease of computation and interpretation. The most important disadvantage lies in the conceptual assumption that all changes in ratings are given the same weight. Hence, a change from a highly unsatisfactory rating (1) to an unsatisfactory rating (2) is weighted as a change from a satisfactory rating (5) to a highly satisfactory rating (6). To counter this, in Appendix K, I also replicate the main tables by using the ordered probit, and the results are robust to this.

6 Concluding Remarks

In this paper, I show that media can affect government actions, in particular the public policy mix, by promoting anti-government demonstrations. I focus on natural disasters because these offer some desirable features in terms of preference mismatch for public policy between the government and citizens. During these extreme events, I show that media activity is associated with lower reconstruction efforts, higher relief/anti-poverty policies, and more anti-government demonstrations. I am unable to show that the reconstruction losses exceed the relief gains, and hence this information might have a welfare-decreasing effect; however, I can provide evidence toward an ambiguity of the effect of media. This provides some evidence that the impact of information on public policy may present a "caveat on multitasking" (Prat and Strömberg, 2011).

In the within-state case study for India, this is shown through the negative interaction between the severity of the floods and measures of media intensity on project performance. In the cross-country study, I verify the negative sign of the interaction between the number of disasters and a media freedom indicator.

My explanation emphasizes the role of the media in urging the government to reallocate its effort from certain objectives (e.g., capital expenditure or reconstruction) to others (e.g., relief or public consumption), by encouraging anti-government demonstrations. The presence of this bargaining tool used by citizens should signal the non-trivial welfare implications related to these decisions. Overall, this paper adds to a recent strand of the

literature, showing that elections are only one of the tools through which citizens can punish an incumbent government: demonstrations seem to be a common and powerful alternative.

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Appendix A

In this appendix, I solve the government's problem:

in regular Times, R, when there is no mismatch between the government and media public good valuations (i.e., both value k and c as $\alpha = 0$);

in a disaster with no demonstration, DN, where there is a valuation mismatch but the media have not called for an anti-government demonstration (i.e., only k is produced);

in a disaster with a demonstration, DD, where there is a valuation mismatch and the media have called for an anti-government demonstration (i.e., both k and c are produced).

Before solving the problem I recall the payoff functions of both players:

$$U_G = (1+\alpha)e^\gamma + s - \frac{1}{2}(e+s)^2;$$

$$U_P = e^\gamma + s.$$

The valuation mismatch arises from the fact that G values both public goods 1 in regular times (like the media), but cares twice as much for k in a disaster (while the media still value k and c equally). This is embedded through the assumption $\alpha \in \{0, 1\}$.

Regular Case *R*

In this case, there is a valuation match, because $\alpha = 0$, and hence the government solves

$$\max_{e,c} U_G = e^\gamma + c - \frac{1}{2}(e+c)^2,$$

which leads to

$$\gamma e^{\gamma-1} = e + c,$$

and

$$1 = e + c.$$

Therefore, $e^R = \gamma^{1/(1-\gamma)}$ and $c^R = 1 - \gamma^{1/(1-\gamma)}$.

Disaster with No Demonstration *DN*

In this case, a valuation mismatch arises because $\alpha = 1$, and the problem is

$$\max_{e,c} U_G = 2e^\gamma + c - \frac{1}{2}(e+c)^2.$$

Then

$$2\gamma e^{\gamma-1} = e + c$$

and

$$1 = e + c,$$

leading to $e^{DN} = (2\gamma)^{1/(1-\gamma)}$ and $c^{DN} = 1 - (2\gamma)^{1/(1-\gamma)}$.

Disaster with Demonstration *DD*

In this case, the media have called for a demonstration, $\sigma = 1$. This forces the government to compromise on its valuation for good k, which declines from 1 to a, with $a \in (0, 1)$, and thus we have

$$\max_{e,c} U_G = (1 + a)e^{\gamma} + c + -\frac{1}{2}(e + c)^2.$$

Then,

$$(1 + a)\gamma e^{\gamma-1} = e + c$$

and

$$1 = e + c,$$

leading to $e^{DD} = [(1 + a)\gamma]^{1/(1-\gamma)}$ and $c^{DD} = 1 - [(1 + a)\gamma]^{1/(1-\gamma)}$.

Proof of Proposition 1

As Proposition 1 states

$$e^{DN} > e^{DD} > e^{R}$$

and

$$c^{R} > c^{DD} > c^{DN},$$

recalling that $e^{DN} = (2\gamma)^{1/(1-\gamma)}$, $e^{DD} = [(1 + a)\gamma]^{1/(1-\gamma)}$, $e^{R} = \gamma^{1/(1-\gamma)}$ while $c^{DN} = 1 - (2\gamma)^{1/(1-\gamma)}$, $c^{DD} = 1 - [(1 + a)\gamma]^{1/(1-\gamma)}$ and $c^{R} = 1 - \gamma^{1/(1-\gamma)}$. Therefore, it is obvious to note that

$$e^{DN} > e^{DD} > e^{R}$$

means

$$(2\gamma)^{1/(1-\gamma)} > [(1 + a)\gamma]^{1/(1-\gamma)} > \gamma^{1/(1-\gamma)},$$

which is clearly true as $a \in (0, 1)$ and indeed

$$2 > (1 + a) > 1.$$

Also, the second inequality follows similarly because

$$c^R > c^{DD} > c^{DN}$$

$$1 - \gamma^{1/(1-\gamma)} > 1 - [(1+a)\gamma]^{1/(1-\gamma)} > 1 - (2\gamma)^{1/(1-\gamma)}$$

$$-1 > -(1+a) > -2.$$

Appendix B

The media can call for a demonstration $\sigma \in \{0, 1\}$, where $\sigma = 1$ implies a call and $\sigma = 0$ does not. The problem can be solved by maximizing the media value function. Recall that I can rewrite the relation between σ and α as

$$\alpha = 1 - (1-a)\sigma,$$

given that when there is a disaster with no demonstration, $\sigma = 0$ and $\alpha = 1$, while in the presence of a demonstration, $\sigma = 1$ and $\alpha = a$. Therefore, the media maximizes its value function, recalling that a demonstration generates a social cost $\chi(\sigma)$

$$\max_{\sigma} U_P = k^{DD}(\sigma) + c^{DD}(\sigma) - \chi(\sigma),$$

which results in the following first-order condition,

$$\left[\frac{\partial k^{DD}(\sigma)}{\partial \sigma} + \frac{\partial c^{DD}(\sigma)}{\partial \sigma}\right] - \frac{\partial \chi(\sigma)}{\partial \sigma} = 0.$$

Recall that $k^{DD}(\sigma) = [(1+\alpha)\gamma]^{\gamma/(1-\gamma)}$ and $c^{DD}(\sigma) = 1 - [(1+\alpha)\gamma]^{1/(1-\gamma)}$, then

$$\frac{\partial k^{DD}(\sigma)}{\partial \sigma} = \frac{\gamma}{1-\gamma}(1+\alpha)^{[\gamma/(1-\gamma)]-1}\gamma^{\gamma/(1-\gamma)}[-(1-a)] = \frac{\gamma}{1-\gamma}\frac{k^{DD}}{1+\alpha}[-(1-a)],$$

and

$$\frac{\partial c^{DD}(\sigma)}{\partial \sigma} = -\frac{1}{1-\gamma}(1+\alpha)^{[1/(1-\gamma)]-1}\gamma^{1/(1-\gamma)}[-(1-a)] = \frac{1}{1-\gamma}\frac{1-c^{DD}}{1+\alpha}(1-a).$$

For simplicity, I model the demonstration cost as increasing in the divergence between the government's original incremental valuation in a disaster, 1, and the after-demonstration valuation, a; hence $\chi = (1-a)\sigma$. Therefore, a demonstration is called if

$$\left[\frac{\partial k^{DD}(\sigma)}{\partial \sigma} + \frac{\partial c^{DD}(\sigma)}{\partial \sigma}\right] - \frac{\partial \chi(\sigma)}{\partial \sigma} > 0,$$

$$\left\{\frac{\gamma}{1-\gamma}\frac{k^{DD}}{1+a}[-(1-a)]+\frac{1}{1-\gamma}\frac{1-c^{DD}}{1+a}(1-a)\right\}-(1-a)>0,$$

$$(1-\gamma)(1+a)<-\gamma k^{DD}+1-c^{DD},$$

$$a<\frac{1-\gamma k^{DD}-c^{DD}}{1-\gamma}-1.$$

If we replace k^{DD} and c^{DD} with their analytical counterparts, given that $\alpha=1$, then

$$a<\frac{(1-2^{\gamma})2^{1/(1-\gamma)}\gamma^{1/(1-\gamma)}}{1-\gamma}-1.$$

Therefore, defining τ as the right-hand side of this expression, there emerges the threshold strategy of the media reported in Proposition 2:

$$\sigma=\begin{cases}1 & \text{if } a<\tau\\ 0 & \text{if } a\geq\tau\end{cases}.$$

Appendix C

In this appendix, I solve the government's problem in the presence of a bank, W, which participates only in the production of good k. Now, the capital technology requires two effort levels $e_G\in[0,1]$ from the government and $e_W\in[0,1]$ from the bank. Always, the bank cares only for k and values it at unit level. The effort choice game between the government and the bank is modeled through a sequential Nash equilibrium. The government moves first and chooses e_G, and then in the second stage the bank, given e_G, chooses e_W. This simplifies the problem because the government decides how much effort it exerts in k, accounting for the best response of W.

Before solving the problem, I recall the payoff functions of the government and the bank:

$$U_G=(1+\alpha)e_W^{1-\gamma}e_G^{\gamma}+c-\frac{1}{2}(e+c)^2;$$

$$U_W=e_W^{1-\gamma}e_G^{\gamma}-\frac{1}{2}e_W^2.$$

Because of the timing of effort choices, the government accounts for the best response of W and internalizes it. This emerges from

$$\max_{e_W}U_W=e_W^{1-\gamma}e_G^{\gamma}-\frac{1}{2}e_W^2,$$

which implies $e_W=(1-\gamma)^{1/(1+\gamma)}e_G^{\gamma/(1+\gamma)}$. Therefore, the government problem accounts

for such a best response

$$\max_{e,c} U_G = (1+\alpha)(1-\gamma)^{(1-\gamma)/(1+\gamma)} e_G^{(2\gamma)/(1+\gamma)} + c - \frac{1}{2}(e+c)^2.$$

As before, the valuation mismatch arises from the fact that G values both public goods 1 in regular times (like the media), but cares for k twice as much as c in a disaster (while the media still values k and c equally). This is embedded through the assumption $\alpha \in \{0, 1\}$.

1. In regular times, R, there is no mismatch between the government and media public good valuations (i.e., both value k and c as $\alpha = 0$).

2. In a disaster with no demonstration, DN, there is a valuation mismatch but the media have not called for an anti-government demonstration (i.e., only k is produced).

3. In a disaster with a demonstration, DD, there is a valuation mismatch and the media have called for an anti-government demonstration (i.e., both k and c are produced).

Regular Case *R*

In this case, there is a valuation match, because $\alpha = 0$, and hence the government solves

$$\max_{e,c} (1-\gamma)^{(1-\gamma)/(1+\gamma)} e_G^{(2\gamma)/(1+\gamma)} + c - \frac{1}{2}(e+c)^2,$$

which leads to

$$\frac{2\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)} e_G^{-[(1-\gamma)/(1+\gamma)]} = e + c$$

$$1 = e + c.$$

Therefore,

$$e_G^R = \left[\frac{2\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)},$$

$$c^R = 1 - \left[\frac{2\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)},$$

and

$$e_W^R = (1-\gamma)\left[\frac{2\gamma}{1+\gamma}\right]^{\gamma/(1-\gamma)}.$$

Disaster with No Demonstration *DN*

In this case, a valuation mismatch arises because $\alpha = 1$, and the problem is

$$\max_{e,c} U_G = 2(1-\gamma)^{(1-\gamma)/(1+\gamma)} e_G^{(2\gamma)/(1+\gamma)} + c - \frac{1}{2}(e+c)^2.$$

Then

$$\frac{4\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}e_G^{-[(1-\gamma)/(1+\gamma)]} = e + c$$

$$1 = e + c,$$

leading to

$$e_G^{DN} = \left[\frac{4\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)},$$

$$c^{DN} = 1 - \left[\frac{4\gamma}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)},$$

and

$$e_W^{DN} = (1-\gamma)\left[\frac{4\gamma}{1+\gamma}\right]^{\gamma/(1-\gamma)}.$$

Disaster with Demonstration *DD*

In this case, the media call for a demonstration, $\sigma = 1$. This forces the government to compromise on its valuation for good k, which declines from 1 to a, with $a \in (0, 1)$. Hence,

$$\max_{e,c} U_G = (1+a)(1-\gamma)^{(1-\gamma)/(1+\gamma)}e_G^{(2\gamma)/(1+\gamma)} + c + -\frac{1}{2}(e+c)^2$$

and

$$\frac{2\gamma(1+a)}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}e_G^{-[(1-\gamma)/(1+\gamma)]} = e + c,$$

$$1 = e + c,$$

which implies

$$e_G^{DD} = \left[\frac{2\gamma(1+a)}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)},$$

$$c^{DD} = 1 - \left[\frac{2\gamma(1+a)}{1+\gamma}(1-\gamma)^{(1-\gamma)/(1+\gamma)}\right]^{(1+\gamma)/(1-\gamma)},$$

and

$$e_W^{DD} = (1-\gamma)\left[\frac{2\gamma(1+a)}{1+\gamma}\right]^{\gamma/(1-\gamma)}.$$

Update of Proposition 1

Proposition 1 can be updated with the last inequality:

$$e_G^{DN} > e_G^{DD} > e_G^R;$$

$$c^R > c^{DD} > c^{DN};$$

$$e_W^{DN} > e_W^{DD} > e_W^R.$$

All of these are clearly true as $a \in (0,1)$. I just show this result for the last inequality as the first two do not change at all:

$$(1-\gamma)\left[\frac{4\gamma}{1+\gamma}\right]^{\gamma/(1-\gamma)} > (1-\gamma)\left[\frac{2\gamma(1+a)}{1+\gamma}\right]^{\gamma/(1-\gamma)} > (1-\gamma)\left[\frac{2\gamma}{1+\gamma}\right]^{\gamma/(1-\gamma)};$$

$$2 > (1+a) > 1.$$

Appendix D: Robustness to Controls

Tables 1–5 report OLS estimates with no controls included. The whole analysis including controls for macroeconomic indicators is reported in Tables D1 and D2 for India, and in Tables D3–D5 for the World. In Tables D1 and D2, I introduce controls for the logarithm of population, the ratio of urban to rural populations, agricultural GDP per capita, and population density. In Tables D3–D5, I introduce controls for the logarithm of population, GDP per capita, population density, exchange rate, a dummy for parliamentary democracy, and the GDP shares of government expenditure, consumption, and investment. Results on the interaction between disasters and media on government performance and political violence are generally stronger and significant at the 1% level, and hence controls seem to bring down the standard errors. Concerning the interaction of disasters and media on the poverty measures, the inclusion of controls does not affect the negative sign, but leads to a loss of significance at 10% (the p-value of the estimate lies around 13–15%).

Table D1: India: Floods and Media – OLS (With Controls)

Variables	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
Flood	−0.0626	0.125	0.0629	0.124	0.778**	0.582*
	(0.0775)	(0.208)	(0.179)	(0.378)	(0.275)	(0.325)
Flood × No. of Newsp				−3.84e-05	−0.0001**	−0.0001*
				(6.35e-05)	(5.83e-05)	(5.68e-05)
No. of Newsp.	−0.0006	0.0002	0.0003	−0.0005	0.0004	0.0005*
	(0.000413)	(0.000299)	(0.000256)	(0.000477)	(0.000385)	(0.000280)
Mean Dep. Var.	4.312	4.060	4.286	4.312	4.060	4.286
Observations	132	132	132	132	132	132
R^2	0.473	0.391	0.470	0.474	0.408	0.484

Note: The unit of observation is project level, and there are state, sector, and year fixed effects. Standard errors clustered at state level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank). These are interpreted as measures of effort levels and project success. All are measured in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. Project performance is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Both flood and media variables are measured in continuous units. The controls included here are population (ln), ratio of urban to rural populations, agricultural GDP per capita, and population density. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Table D2: India: Floods and Media – OLS (With Controls)

Variables	Political Violence				
	(1)	(2)	(3)	(4)	(5)
Flood	−0.0841**	−0.156**	0.0256	−0.0506	−0.0437
	(0.0364)	(0.0637)	(0.118)	(0.0342)	(0.0350)
Flood × Media	8.64e-05***	0.0363***	0.0007	3.44e-05***	0.0001***
	(1.66e-05)	(0.00735)	(0.0006)	(9.58e-06)	(5.69e-05)
Media	−0.217	−0.0640	−2.730	−0.006***	−0.0003*
	(0.129)	(0.0746)	(1.630)	(0.003)	(0.0001)
Media	No. of Newsp.	AIRs	No. of Daily Newsp.	Newsp. Circ.	No. of Newsp. Adj. Pop. Dens.
Observations	491	197	148	519	491
R^2	0.311	0.431	0.419	0.301	0.309

Note: The unit of observation is at state level, and there are state and year fixed effects. Standard errors clustered at state level are shown in parentheses. Political Violence reports an annual count measure of "political violent events", and Urdal (2008) states that these "encompass forms of political violence that are less organized (than Armed Conflicts) like inter-communal violence, political assassinations, and rioting". Political violence is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Beyond the number of newspapers, I also use alternative media variables: number of newspapers not adjusted by population density, the number of all-India Radio (AIR) stations, the number of daily newspapers, and a measure of newspaper circulation in the population. Both flood and media variables are measured in continuous units. The controls included are population (ln), ratio of urban to rural populations, agricultural GDP per capita, and population density. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively

Table D3: World: Disasters and Media – OLS (With Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0155*	0.0260***	0.0111	0.0167*	0.0294***	0.0144**
	(0.00925)	(0.00772)	(0.00735)	(0.00900)	(0.00727)	(0.00661)
No. of Disasters × Free Media				−0.0107	−0.0304*	−0.0287*
				(0.0146)	(0.0163)	(0.0157)
Free Media	−0.0290	0.0797	0.00490	0.0164	0.208**	0.127
	(0.0964)	(0.0791)	(0.0831)	(0.124)	(0.100)	(0.0932)
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,185	4,185	4,185	4,185	4,185	4,185
R^2	0.126	0.115	0.090	0.126	0.115	0.091
Panel B						
Disaster Type	0.0174	0.0173	−0.00840	0.446***	0.396**	0.317*
	(0.0130)	(0.0143)	(0.0111)	(0.154)	(0.154)	(0.164)
Disaster Type × Free Media	−0.0392*	−0.0394	−0.0362*	−0.442	−0.678***	−0.613
	(0.0203)	(0.0275)	(0.0202)	(0.347)	(0.257)	(0.520)
Free Media	0.126	0.232*	0.151	−0.0351	0.0745	0.00510
	(0.104)	(0.130)	(0.108)	(0.0937)	(0.0773)	(0.0810)
Disaster Type	No. of Casualties	No. of Casualties	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Observations	4,185	4,185	4,185	4,185	4,185	4,185
R^2	0.126	0.114	0.091	0.127	0.114	0.091

Note: The unit of observation is project level, and there are country, sector, and year fixed effects. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called "Disaster 90" (80/70), which is defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed, as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table D4: World: Disasters and Media – OLS (With Controls)

Variables	Anti-Government Demonstrations				
	(1)	(2)	(3)	(4)	(5)
Disaster	−0.00341	−0.0324	−0.429	−0.116	−0.207
	(0.0506)	(0.026)	(0.342)	(0.172)	(0.137)
Disaster × Free Media	0.205	0.181	1.386*	0.891	0.783**
	(0.142)	(0.110)	(0.712)	(0.586)	(0.375)
Free Media	−0.481	−0.499	0.0760	0.0283	−0.0116
	(0.401)	(0.302)	(0.403)	(0.402)	(0.391)
Disaster Type	No. of Disasters	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	0.714	0.714	0.714	0.714	0.714
Observations	1,660	1,660	1,660	1,660	1,660
R^2	0.318	0.314	0.309	0.310	0.310

Note: The unit of observation is at country level, and there are country and year fixed effects. Standard errors clustered at country level are shown in parentheses. The table reports anti-government demonstrations, described by Banks and Wilson (2015) as "any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature". The left-hand side variables are regressed over a measure of disaster and media freedom. Number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. Number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events I also define a dummy variable called "Disaster 90" (80/70) defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of killed people as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. The following controls are included: population (ln), GDP per capita, population density, share of GDP in government spending, share of GDP in investment, share of GDP in consumption, and a dummy for parliamentary democracy. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table D5: World: Disasters and Media – OLS (With Controls)

Variables	Poverty Headcount			Poverty Gap		
	National	Urban	Rural	National	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty Rates						
No. of Disasters	0.0868	0.118	0.184	−0.121	−0.290	−0.267
	(0.415)	(0.431)	(0.336)	(0.252)	(0.301)	(0.417)
No. of Disasters × Free Media	−0.306	−0.844	0.0981	−1.028	−0.210	−1.029
	(0.723)	(1.104)	(0.818)	(1.006)	(0.945)	(1.068)
Free Media	−6.519	0.927	−6.456	−3.672	−1.149	−3.920
	(4.823)	(7.547)	(5.452)	(4.869)	(4.384)	(6.238)
Observations	190	173	159	73	66	66
R^2	0.947	0.913	0.951	0.953	0.890	0.919
Poverty Rates, Casualties						
No. of Casualties	0.261	0.589*	0.254	0.418	0.305	0.501
	(0.310)	(0.329)	(0.410)	(0.309)	(0.356)	(0.452)
No. of Casualties × Free Media	−1.692**	−0.739	−1.997*	−7.903*	−5.640	−8.811
	(0.745)	(0.757)	(0.996)	(3.933)	(4.478)	(5.175)
Free Media	−0.992	1.320	1.553	29.29**	23.43	32.67*
	(4.815)	(7.501)	(4.985)	(14.04)	(17.63)	(17.27)
Observations	176	160	146	61	53	53
R^2	0.954	0.932	0.958	0.969	0.912	0.964
Poverty Rates, Extreme Events						
Disaster 70	0.970	0.512	0.294	0.921	−0.280	1.404
	(2.362)	(2.246)	(2.204)	(1.740)	(1.334)	(2.188)
Disasters 70 × Free Media	−1.960	−1.636	−1.009	−7.485	−4.388	−8.041
	(2.606)	(3.444)	(4.443)	(4.559)	(4.460)	(5.390)
Free Media	−6.604	−1.035	−5.138	0.233	1.968	0.752
	(4.299)	(5.246)	(4.185)	(4.398)	(6.439)	(6.249)
Observations	172	157	143	60	53	53
R^2	0.952	0.930	0.957	0.965	0.906	0.962

Note: The unit of observation is at country level, and there are country fixed effects. Standard errors clustered at country level are shown in parentheses. Here, I use poverty measures as proxy for relief spending. The National Poverty Headcount measures the poverty rate as the percentage of the population living below the national poverty line; national estimates are based on population-weighted subgroup estimates from household surveys. The Urban and Rural Poverty Headcount replicate the same measure but with the urban and rural poverty lines, respectively. The National Poverty Gap measures the mean shortfall from the poverty line (counting the non-poor as having zero shortfall) as a percentage of the national poverty line; this measure reflects both the depth of poverty and its incidence. The Urban and Rural Poverty Gap replicate the same measure but with the urban and rural poverty lines, respectively. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events I also define a dummy variable called "Disaster 90" (80/70) defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of killed people as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. In the bottom panel, for extreme events, I use Disaster 70, instead of 90, because given the small number of observations there are no Disaster 90 events included. The following controls are included: population (ln), GDP per capita, population density, share of GDP in government spending, share of GDP in investment, share of GDP in consumption, and a dummy for parliamentary democracy. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix E: Robustness to Alternative Media Indicators

In Tables 1–5, the main results were obtained by using two measures of media activity: the number of newspapers adjusted by population density for India and a free media dummy for the World. Here, I check the robustness of the previous results using two alternative media indicators for India: the number of newspapers with no population density weight and the newspaper circulation. As Table E1 shows, the interaction between the alternative media indicators and floods for India is unaffected in its sign and significance by changes of media indicator. Unfortunately, without other reliable cross-country and time-varying media indicators, I cannot repeat the same exercise for my World sample.

Table E1: India: Floods and Media – OLS (No Controls)

Variables	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Flood Area	−0.0902	0.137	0.0765	−0.0169	0.662*	0.540
	(0.0841)	(0.199)	(0.174)	(0.511)	(0.334)	(0.365)
Flood Area× No. of Newsp.				−3.68e-05	−0.0002*	−0.0002
				(0.000226)	(0.000131)	(0.000138)
No. of Newsp.	−0.0006	0.0003	0.0003	−0.0006	0.0008	0.0007
	(0.000656)	(0.000571)	(0.000660)	(0.000967)	(0.000746)	(0.000818)
Mean Dep. Var.	4.312	4.060	4.286	4.312	4.060	4.286
Observations	131	131	131	131	131	131
R^2	0.452	0.390	0.463	0.453	0.400	0.473
Panel B						
Flood Area	−0.0792	0.131	0.0715	−0.0340	0.946*	0.546
	(0.0952)	(0.199)	(0.166)	(0.578)	(0.504)	(0.390)
Flood Area × Newsp. Circulation				−1.10e-05	−0.000198*	−0.000115
				(0.000123)	(9.64e-05)	(6.86e-05)
Newsp. Circulation	−9.40e-05	0.0002	−3.94e-05	−8.22e-05	0.0004*	8.47e-05
	(0.000138)	(0.000159)	(0.000118)	(0.000199)	(0.000232)	(0.000126)
Mean Dep. Var.	4.312	4.060	4.286	4.312	4.060	4.286
Observations	131	131	131	131	131	131
R^2	0.445	0.387	0.460	0.445	0.406	0.468

Note: In the top panel, the unit of observation is at project level, and there are state, sector, and year fixed effects. In the bottom panel, the unit of observation is at state level, and there are state and year fixed effects. Standard errors clustered at state level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix F: Robustness to the Alternative Clustering of Standard Errors

Alternative Clustering of Standard Errors

In Tables 1–5, I used standard errors clustered at state level (Tables 1 and 2) and country level (Table 3–5), which might give rise to a variety of concerns. In the first case, because of the small number of clusters for India (15 states are included in the sample), my standard error estimates might be biased down. To counter this claim, I can offer three arguments.

1. Roger (1993) argues that the severity of this bias is small ($\simeq 0.2\%$) if clusters are equally sized (each holds around 5% of observations). My sample is not perfect because two states (Maharashtra and West Bengal) hold 30% of observations, whereas the remaining 13 states hold around 5% of observations each. Therefore, this might offer some comfort that the standard error bias is not excessive.

2. I provide alternative estimates clustered at state–year level, so that now the number of clusters exceeds 100.

Table F1: India: Floods and Media – OLS and BRL (No Controls)

Variables	OLS			BRL		
	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
Flood Area	0.124	0.778**	0.582*	0.0989	0.229	0.155
	(0.378)	(0.275)	(0.325)	(10.37)	(0.167)	(1.724)
Flood Area× No. of Newsp.	−3.84e-05	−0.0001**	−0.0001*	−2.62e-05	−3.55e-05	−2.52e-05
	(6.35e-05)	(5.83e-05)	(5.68e-05)	(0.00138)	(2.57e-05)	(0.000323)
No. of Newsp.	−0.000593	0.000431	0.000498*	2.56e-09	1.35e-05	1.06e-05
	(0.000477)	(0.000385)	(0.000280)	(0.000173)	(9.16e-05)	(0.000314)
Observations	132	132	132	132	132	132
R^2	0.474	0.408	0.484			

Note: The unit of observation is project level, and there are state, sector, and year fixed effects. Standard errors clustered at state level are shown in parentheses. Columns (1)–(3) report OLS estimates, while Columns (4)–(6) use a three-step BRL estimator, as described in the text. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank). These are interpreted as measures of effort levels and project success. All are measured in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). Project performance is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

3. Following Bell and McCaffrey (2002), Angrist and Pischke (2009), and Imbens and Kolesar (2012), I apply the method of biased-reduced linearization (BRL), which provides a standard error correction to account for the small number of clusters (it modifies the degrees of freedom of the t distribution). This method is made available by Angrist and Pischke.[18]

Table F2: India: Floods and Media – OLS (No Controls)

Variables	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
Flood	−0.0626	0.125	0.0629	0.124	0.778	0.582
	(0.174)	(0.216)	(0.183)	(0.432)	(0.475)	(0.372)
Flood × No. of Newsp.				−3.84e-05	−0.0001*	−0.0001*
				(7.96e-05)	(8.41e-05)	(6.34e-05)
No. of Newsp.	−0.000649	0.000231	0.000343	−0.000593	0.000431	0.000498*
	(0.000399)	(0.000328)	(0.000231)	(0.000420)	(0.000344)	(0.000244)
Mean Dep. Var.	4.312	4.060	4.286	4.312	4.060	4.286
Observations	132	132	132	132	132	132
R^2	0.473	0.391	0.470	0.474	0.408	0.484

Note: The unit of observation is project level, and there are state, sector, and year fixed effects. Standard errors clustered at state level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank). These are interpreted as measures of effort levels and project success. All are measured in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. Project performance is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Unfortunately, because my estimation relies on the use of three sets of fixed effects (state, sector, and year), it is not possible to implement the BRL correction. For this reason, I try to adapt this to my case through a three-step estimation. In the first step, I regress each left-hand side variable (project outcome, borrower performance, and bank performance) over the set of fixed effects (state, sector, and year). In the second step, I store the residuals of these regressions, which have partialled out all of these means. In the third step, I apply the BRL correction and regress these residuals over my right-hand side variables (floods, media, and their interaction).

In order to make this estimation comparable across the two different methods in this section, I provide tables with this three-step estimation, using both the simple clustering procedure and the BRL technique. For India, the standard errors increase, but my core

[18]Refer to `http://economics.mit.edu/faculty/angrist/data1/mhe/brl`.

result (the significance for borrower performance) remains, and this might reinforce the defense made in (1) and (2) above. Both methods (2) and (3) deliver results in line with Tables 1 and 2, and this might address some of the concerns about this procedure. Regarding the three-step BRL estimation, it is not the most suitable for a variety of reasons; however, it provides an alternative benchmark to understand the severity of this problem.

Regarding the World case study, it can be argued that shocks might be correlated across country–time beyond country. For this reason, here I provide the same estimation as in Tables 3–5, but proposing two levels of clustering: one with respect to country and the other with respect to country–year. The results are in line with Tables 3–5.

Table F3: India: Floods and Media – OLS and BRL (No Controls)

Variables	Political Violence				
	(1)	(2)	(3)	(4)	(5)
BRL					
Flood Area	−0.0303	−0.0994	−0.000610	−0.0102	−0.00887
	(0.0627)	(0.978)	(0.0346)	(0.161)	(0.195)
Flood Area × Media	4.26e-05**	0.0281	0.0007*	1.29e-05	8.95e-05
	(1.73e-05)	(0.129)	(0.0004)	(5.71e-05)	(0.0003)
Media	−4.62e-05*	−0.0495	−0.00167	−4.80e-06	−0.0003*
	(2.71e-05)	(0.112)	(0.00143)	(5.59e-06)	(0.0001)
Media	No. of Newsp.	AIRs	No. of Daily Newsp.	Newsp. Circ.	No. of Newsp. Adj. Pop. Dens.
Observations	491	197	148	519	491
OLS					
Flood	−0.0841	−0.156	0.0256	−0.0506	−0.0437
	(0.0627)	(0.121)	(0.118)	(0.0577)	(0.0543)
Flood × Media	0.08*	0.0363*	0.717	0.03*	0.0002***
	(0.03)	(0.021)	(0.808)	(0.012)	(7.69e-05)
Media	−0.217	−0.0640	−2.730	−0.006***	−0.0003*
	(0.239)	(0.0956)	(1.930)	(0.065)	(0.0025)
Media	No. of Newsp.	AIRs	No. of Daily Newsp.	Newsp. Circ.	No. of Newsp. Adj. Pop. Dens.
Observations	491	197	148	519	491
R^2	0.311	0.431	0.419	0.301	0.309

Note: The unit of observation is at state level, and there are state and year fixed effects. Standard errors clustered at state level are shown in parentheses. Political Violence reports an annual count measure of "political violent events", and Urdal (2008) states that these "encompass forms of political violence that are less organized (than Armed Conflicts) like inter-communal violence, political assassinations, and rioting". Political violence is regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting; this is divided by population density to account for the impact of the news. Beyond the number of newspapers, I also use alternative media variables: number of newspapers not adjusted by population density, the number of all-India Radio (AIR) stations, the number of daily newspapers, and a measure of newspaper circulation in the population. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Table F4: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
No. of Casualties	0.0151*	0.0268***	0.00960	0.0162*	0.0297***	0.0119*
	(0.00859)	(0.00668)	(0.00707)	(0.00847)	(0.00607)	(0.00619)
No. of Casualties × Free Media				−0.0126	−0.0331**	−0.0257*
				(0.0142)	(0.0163)	(0.0147)
Free Media	−0.0781	0.0523	−0.0289	−0.0242	0.193*	0.0806
	(0.103)	(0.0878)	(0.0860)	(0.127)	(0.114)	(0.103)
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.117	0.108	0.083	0.117	0.109	0.084
Panel B						
Disaster Type	0.0147	0.0132	−0.0132	0.428***	0.357***	0.257*
	(0.0125)	(0.0138)	(0.0108)	(0.135)	(0.138)	(0.146)
Disaster Type × Free Media	−0.0441**	−0.0473*	−0.0364*	−0.532*	−0.790***	−0.644
	(0.0203)	(0.0263)	(0.0189)	(0.281)	(0.247)	(0.454)
Free Media	0.101	0.241*	0.122	−0.0841	0.0490	−0.0267
	(0.109)	(0.138)	(0.113)	(0.101)	(0.0871)	(0.0846)
Disaster Type	No. of Casualties	No. of Casualties	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.120	0.107	0.085	0.120	0.107	0.084

Note: The unit of observation is project level, and there are country, sector, and year fixed effects. Standard errors that are two-way clustered at country and country-year level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called "Disaster 90" (80/70), which is defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed, as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F5: World: Disasters and Media – OLS (No Controls)

Variables	Anti-Government Demonstrations				
	(1)	(2)	(3)	(4)	(5)
Disaster	−0.0250	−0.032	−0.418	−0.149	−0.232*
	(0.0413)	(0.022)	(0.325)	(0.165)	(0.136)
Disaster × Free Media	0.219	0.170	1.163*	0.693	0.575*
	(0.150)	(0.137)	(0.658)	(0.501)	(0.327)
Free Media	−0.590	−0.523	0.0185	−0.0115	−0.0377
	(0.389)	(0.326)	(0.403)	(0.414)	(0.408)
Disaster Type	No. of Disasters	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	0.714	0.714	0.714	0.714	0.714
Observations	1,774	1,774	1,774	1,774	1,774
R^2	0.295	0.287	0.282	0.283	0.283

Note: The unit of observation is at country level, and there are country and year fixed effects. Standard errors clustered at country level are shown in parentheses. The table reports anti-government demonstrations, described by Banks and Wilson (2015) as "any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature". The left-hand side variables are regressed over a measure of disaster and media freedom. Number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. Number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events I also define a dummy variable called "Disaster 90" (80/70) defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of killed people as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F6: World: Disasters and Media – OLS (No Controls)

Variables	Poverty Headcount			Poverty Gap		
	National	Urban	Rural	National	Urban	Rural
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty Rates						
No. of Disasters	0.301*	0.348*	0.285*	−0.00147	−0.0434	0.0129
	(0.170)	(0.179)	(0.166)	(0.0576)	(0.0650)	(0.0865)
No. of Disasters × Free Media	−0.570	−1.212	−0.757	−0.412	−0.397**	−0.901***
	(0.735)	(0.929)	(0.988)	(0.377)	(0.189)	(0.341)
Free Media	−4.488*	1.711	−3.767	−0.826	−0.849	−2.159
	(2.665)	(5.127)	(2.920)	(2.059)	(2.398)	(4.189)
Observations	227	205	191	90	79	79
R^2	0.878	0.855	0.910	0.919	0.901	0.889
Poverty Rates, Extreme Events						
Disaster 70	1.442	2.146	1.783	0.848	0.0254	1.708
	(1.790)	(1.621)	(1.919)	(0.998)	(0.682)	(1.098)
Disasters 70 × Free Media	−1.297	−2.746	0.0196	−1.914	−2.204*	−5.711**
	(1.935)	(2.908)	(1.905)	(1.813)	(1.331)	(2.483)
Free Media	−6.218***	−0.985	−6.048**	−1.487	−2.366	−4.309
	(2.399)	(4.162)	(2.814)	(2.114)	(2.324)	(4.428)
Observations	207	187	173	76	65	65
R^2	0.911	0.898	0.935	0.925	0.913	0.922

Note: The unit of observation is at country level, and there are country and year fixed effects. Standard errors clustered at country level are shown in parentheses. Here, I use poverty measures as proxy for relief spending. The National Poverty Headcount measures the poverty rate as the percentage of the population living below the national poverty line; national estimates are based on population-weighted subgroup estimates from household surveys. The Urban and Rural Poverty Headcount replicate the same measure but with the urban and rural poverty lines, respectively. The National Poverty Gap measures the mean shortfall from the poverty line (counting the non-poor as having zero shortfall) as a percentage of the national poverty line; this measure reflects both the depth of poverty and its incidence. The Urban and Rural Poverty Gap replicate the same measure but with the urban and rural poverty lines, respectively. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events I also define a dummy variable called "Disaster 90" (80/70) defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of killed people as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. In the bottom panel, for extreme events, I use Disaster 70, instead of 90, because given the small number of observations there are no Disaster 90 events included. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Jackknife

In order to test for the robustness of my results, I replicate the results of Tables 3–5 using a jackknife estimation. This is a procedure analogous to the bootstrap method, in which I replicate each regression n times (where n is the number of observations), leaving out one observation at every iteration. The results are robust to this.

Table F7: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0151**	0.0268***	0.00960	0.0162**	0.0297***	0.0119
	(0.00721)	(0.00755)	(0.00730)	(0.00723)	(0.00749)	(0.00729)
No. of Disasters × Free Media				−0.0126	−0.0331**	−0.0257*
				(0.0147)	(0.0159)	(0.0143)
Free Media	−0.0781	0.0523	−0.0289	−0.0242	0.193*	0.0806
	(0.0682)	(0.0742)	(0.0688)	(0.0924)	(0.102)	(0.0927)
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.119	0.108	0.083	0.120	0.109	0.084
Panel B						
Disaster Type	0.0147	0.0132	−0.0132	0.428***	0.357**	0.257*
	(0.0117)	(0.0128)	(0.0119)	(0.137)	(0.154)	(0.141)
Disaster Type × Free Media	−0.0441**	−0.0473**	−0.0364*	−0.532	−0.790**	−0.644
	(0.0213)	(0.0236)	(0.0209)	(0.329)	(0.379)	(0.403)
Free Media	0.101	0.241*	0.122	−0.0841	0.0490	−0.0267
	(0.108)	(0.124)	(0.110)	(0.0684)	(0.0745)	(0.0689)
Disaster Type	No. of Casualties	No. of Casualties	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.120	0.107	0.085	0.120	0.107	0.084

Note: This table reports OLS estimates. In Panels A and B, the unit of observation is project level, and there are country, sector, and year fixed effects. Standard errors are shown in parentheses and are calculated using a jackknife procedure. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). Their respective mean is reported in the Mean Dep. Var. row. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called Disaster 90 (80/70) defined as a binary variable standing for disaster at the 90th (80th/70th) percentile; it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix G: Placebos and Alternative Scenarios for Political Violence

In Tables 2 and 4, I show that there is a positive correlation between political violence in India and anti-government demonstrations for the World. However, this result supports my theory only if these events are indeed demonstrations and not related to other conflict stories. For example, a disaster might be a moment in which the military is mobilized during the response to a disaster, and therefore a guerrilla attack might be more successful in securing a portion of territory. To exclude these plausible alternative scenarios, here I propose the same regressions as in Tables 2 and 4 but with different indicators. For India, I can show that during floods and media activity, there is no effect on the "Incidence of Armed Conflict" and also that there is no increase in "Political Violence in Neighboring States". For the World, I can show that disasters in the presence of free media are not associated with more guerrilla warfare or revolutions.

Table G1: India: Floods and Media – OLS (No Controls)

Variable	Killed (ln)	Injured (ln)	Arrested (ln)	Duration (ln)	Number (ln)
	(1)	(2)	(3)	(4)	(5)
Flood Area	−0.403	0.644	−0.380	−0.0903	−0.258**
	(0.337)	(0.487)	(0.620)	(0.221)	(0.0881)
Flood Area × No. of Newsp.	−0.000462	−0.00109***	−0.00114	−0.000405*	−0.000142
	(0.000300)	(0.000313)	(0.000644)	(0.000201)	(0.000109)
No. of Newsp.	6.20e-05	−0.000377	0.000333	−0.000174	−0.000130
	(0.000502)	(0.000754)	(0.000767)	(0.000353)	(0.000247)
Observations	128	128	128	128	128
R^2	0.501	0.491	0.590	0.576	0.631

Note: This table reports OLS estimates with state and year fixed effects; standard errors are clustered at state level. The unit of observation is state–year. This table reports evidence of Hindu–Muslim violence, from the database "Indian Subnational Problem Set" (Marshall et al., 2005), where all variables are reported as the natural logarithm of one plus the number of killed, injured, or arrested, and the duration and number of these Hindu–Muslim conflicts. The regression is over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Table G2: India: Floods and Media – OLS (No Controls)

Variable	(1)	(2)	(3)	(4)	(5)
Panel A: Political Violence in Neighboring States					
Flood Area	0.00869	−0.0352	−0.0120	0.0123	0.00450
	(0.0165)	(0.0446)	(0.0474)	(0.0143)	(0.0130)
Flood Area × Media	−1.02e-05	0.00413	−0.000131	−7.67e-06	−2.61e-05
	(1.02e-05)	(0.00567)	(0.000326)	(5.83e-06)	(2.55e-05)
Media	−3.73e-05	−0.00429	−0.000413	−1.18e-05	−9.82e-05**
	(2.56e-05)	(0.0234)	(0.000576)	(1.21e-05)	(4.33e-05)
Media	No. of Newsp.	AIRs	No. of Daily Newsp.	Newsp. Circ.	No. of Newsp. Adj. Pop. Dens.
Observations	491	197	148	519	491
R^2	0.244	0.367	0.308	0.235	0.251
Panel B: Incidence of Armed Conflict					
Flood Area	0.0154	0.0621	−0.0128	0.0377	0.0219
	(0.0267)	(0.0521)	(0.0332)	(0.0258)	(0.0255)
Flood Area × Media	9.48e-06	−0.00829	7.61e-05	−4.22e-06	1.23e-05
	(1.24e-05)	(0.00702)	(0.000209)	(5.55e-06)	(3.18e-05)
Media	−8.68e-05	−0.0264	−0.00158	−1.53e-05	−0.0001
	(6.14e-05)	(0.0287)	(0.00116)	(1.78e-05)	(8.76e-05)
Media	No. of Newsp.	AIRs	No. of Daily Newsp.	Newsp. Circ.	No. of Newsp. Adj. Pop. Dens.
Observations	539	197	148	531	539
R^2	0.341	0.501	0.431	0.328	0.338

Note: This table reports OLS estimates with state and year fixed effects; standard errors are clustered at state level. The unit of observation is state–year. Panel A reports Political Violence in Neighboring States as left-hand side variable, defined by Urdal (2008) as high-level violence in a neighboring state defined by a shared land border. Panel B reports the dependent variable, Incidence of Armed Conflict, defined by Urdal (2008) as the incidence of armed conflict with at least 25 battle-related deaths (PRIO/Uppsala conflict data; see Gleditsch et al., 2002). These are regressed over flood and number of newspapers adjusted by population density, and their interaction. Flood describes the area (in million hectares) of a state under floods in a given year. Number of newspapers stands for the number of available newspapers and periodicals, as recorded in the official records of the Ministry of Information and Broadcasting. In Panel B, beyond the number of newspapers, I also use alternative media variables: number of newspapers not adjusted by population density, the number of all-India Radio (AIR) stations, the number of daily newspapers, and a measure of newspaper circulation in the population. Both flood and media variables are measured in continuous units. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Table G3: World: Disasters and Media – OLS (no controls)

Variable	(1)	(2)	(3)	(4)	(5)
Panel A: Guerrilla Warfare					
Disaster Type	0.00519	−0.00237	−0.0543	0.0663	0.0470
	(0.151)	(0.00491)	(0.313)	(0.059)	(0.0520)
Disaster Type × Free Media	0.021	0.0168	0.0647	−0.0135	−0.0213
	(0.021)	(0.123)	(0.0645)	(0.0124)	(0.0714)
Free Media	−0.110	−0.107*	−0.0546	−0.0564	−0.0537
	(0.0710)	(0.0578)	(0.0569)	(0.0582)	(0.0591)
Disaster Type	No. of Disasters	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Observations	1,660	1,660	1,660	1,660	1,660
R^2	0.456	0.454	0.453	0.454	0.454
Panel B: Revolutions					
Disaster	0.0256	0.0162	−0.00706	0.0005	0.0723
	(0.017)	(0.0150)	(0.097)	(0.005)	(0.0835)
Disaster × Free Media	−0.0389**	−0.0293*	0.165*	0.0813	−0.0406
	(0.015)	(0.017)	(0.160)	(0.0920)	(0.102)
Free Media	−0.0388	−0.0444	−0.140*	−0.143*	−0.133*
	(0.0832)	(0.0733)	(0.0763)	(0.0765)	(0.0795)
Disaster Type	No. of Disasters	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Observations	1,660	1,660	1,660	1,660	1,660
R^2	0.272	0.269	0.267	0.267	0.268

Note: This table reports OLS estimates. In both panels, the unit of observation is country–year. In Panel A, I explore guerrilla warfare, which is described by Banks and Wilson (2015) as any armed activity, sabotage, or bombings carried on by independent bands of citizens or irregular forces and aimed at the overthrow of the present regime. In Panel B, I focus on revolutions, defined by Banks and Wilson (2015) as any illegal or forced change in the top government elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government. The left-hand side variables in both panels are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called "Disaster 90 (80/70)" defined as a binary variable standing for "disaster at the 90th (80th/70th) percentile": it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed, as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix H: Alternative Institutional Measures

Because the cross-country analysis described in Tables 3–5 describes the interaction of changes in disasters with changes in media freedom, it might be plausible that changes in such an indicator simply pick up changes in other institutional variables. For this reason, here I repeat the cross-country analysis performed in Table 3–5, and replace the Free Media dummy with two "institutional measures": in Table H1, a dummy for Parliamentary Democracy, and in Table H2, a dummy for countries with high constraints on the executive, in the spirit of Besley and Persson (2011). The results are very different for the interaction between a disaster and the alternative institutional dummy: it is positive and sometimes significant for parliamentary democracy, and mostly insignificant for constraints on the executive. Hence, the interaction between media and disasters is not led by changes in democracy or other institutional features.

Table H1: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0149	0.0267***	0.0115	0.0152*	0.0275***	0.0115*
	(0.00918)	(0.00744)	(0.00715)	(0.00891)	(0.00719)	(0.00687)
No. of Disasters × Parl. Dem.				−0.00916	−0.0190	0.000686
				(0.0154)	(0.0147)	(0.0154)
Parl. Dem.	−0.0830	0.0209	0.0256	−0.0420	0.106	0.0226
	(0.0925)	(0.0993)	(0.105)	(0.137)	(0.106)	(0.103)
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,227	4,227	4,227	4,227	4,227	4,227
R^2	0.121	0.110	0.085	0.121	0.110	0.085
Panel B						
No. of Casualties	0.00618	0.00441	−0.0210*	0.00222	0.00697	−0.0225**
	(0.0130)	(0.0135)	(0.0106)	(0.0133)	(0.0140)	(0.0108)
No. of Casualties × Parl. Dem.				0.0393*	−0.0254	0.0153
				(0.0207)	(0.0232)	(0.0257)
Parl. Dem.	−0.0873	0.0137	0.0243	−0.264	0.128	−0.0445
	(0.0953)	(0.115)	(0.108)	(0.160)	(0.140)	(0.123)
Observations	4,227	4,227	4,227	4,227	4,227	4,227
R^2	0.120	0.108	0.085	0.121	0.108	0.086
Panel C						
Disaster 90	0.260*	0.193	0.0997	0.242*	0.169	0.101
	(0.142)	(0.165)	(0.200)	(0.144)	(0.171)	(0.196)
Disaster 90 × Parl. Dem.				0.326**	0.439*	−0.0195
				(0.134)	(0.244)	(0.333)
Parl. Dem.	−0.0839	0.0162	0.0238	−0.0889	0.00942	0.0241
	(0.0934)	(0.115)	(0.109)	(0.0939)	(0.119)	(0.110)
Observations	4,227	4,227	4,227	4,227	4,227	4,227
R^2	0.121	0.108	0.085	0.121	0.109	0.085

Note: This table reports OLS estimates. In Panel A, the unit of observation is at project level, and there are country, sector, and year fixed effects. In Panels B and C, because the unit of observation is at country level, I only include country and year fixed effects. Standard errors clustered at country level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory), and their respective mean is reported in the Mean Dep. Var. row. In all panels, left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called "Disaster 90" defined as a binary variable standing for "disaster at the 90th percentile": it takes unit value if a country in a given year exceeds the 90th percentile of its distribution in both the number of disasters and the number of people killed as recorded in EM-DAT. The Parl. Dem. dummy takes unit value if a country is classified as a parliamentary democracy in a given year, as described in Besley and Persson (2011). No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table H2: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0139	0.0295*	0.0161	0.0149	0.0260	0.0113
	(0.0180)	(0.0155)	(0.0133)	(0.0204)	(0.0172)	(0.0157)
No. of Disasters				−0.00419	0.0144	0.0193
× High Exec. Constr.				(0.0382)	(0.0322)	(0.0248)
High Exec. Constr.	0.0581	0.141	0.0179	0.0730	0.0897	−0.0508
	(0.156)	(0.180)	(0.163)	(0.188)	(0.208)	(0.181)
Observations	3,166	3,166	3,166	3,166	3,166	3,166
R^2	0.138	0.119	0.088	0.138	0.119	0.089
Panel B						
No. of Casualties	0.0151	0.0127	−0.0242*	0.00700	0.00385	−0.0301**
	(0.0151)	(0.0170)	(0.0136)	(0.0163)	(0.0178)	(0.0147)
No. of Casualties				0.0480*	0.0526*	0.0350
× High Exec. Constr.				(0.0269)	(0.0289)	(0.0279)
High Exec. Constr.	0.0617	0.154	0.0337	−0.136	−0.0632	−0.110
	(0.153)	(0.179)	(0.161)	(0.200)	(0.188)	(0.166)
Observations	3,166	3,166	3,166	3,166	3,166	3,166
R^2	0.138	0.118	0.089	0.139	0.119	0.089
Panel C						
Disaster 90	0.344	0.102	−0.352	0.340	0.121	−0.374
	(0.285)	(0.308)	(0.411)	(0.309)	(0.331)	(0.446)
Disaster 90				0.0473	−0.240	0.267
× High Exec. Constr.				(0.398)	(0.576)	(0.606)
High Exec. Constr.	0.0646	0.157	0.0282	0.0645	0.158	0.0275
	(0.153)	(0.178)	(0.163)	(0.153)	(0.178)	(0.163)
Observations	3,166	3,166	3,166	3,166	3,166	3,166
R^2	0.139	0.118	0.089	0.139	0.118	0.089

Note: This table reports OLS estimates. In Panel A, the unit of observation is at project level, and there are country, sector, and year fixed effects. In Panels B and C, the unit of observation is at country level, and there are country and year fixed effects in Panel B and only country year in Panel C. Standard errors clustered at country level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). In all panels, left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called "Disaster 90" defined as a binary variable standing for "disaster at the 90th percentile": it takes unit value if a country in a given year exceeds the 90th percentile of its distribution in both the number of disasters and the number of people killed as recorded in EM-DAT. The High Exec. Constr. dummy takes unit value if a country is classified as presenting high constraints on the executive in a given year, as described in Besley and Persson (2011). No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix I: Within-Capital Effort Reallocation

As a further check, I test whether an effect similar to the between-task reallocation also occurs within tasks. From the sector data, I can reclassify whether a project belongs to the infrastructure sector, economic policy or human capital (health and education mainly). If within-task reallocation also occurs, I would expect effort to be redirected from infrastructure and economic projects, to human capital projects (analogous to reallocation from k to c). This is what I test now, where I run the same regressions presented in Table 3, but I test the triple interaction of disaster with free media and human capital sector. I find that while the interaction of disaster and free media and infrastructure/economic projects is negative and significant, the estimate for the same interaction for human capital is not. Therefore, this provides some weak evidence on the existence of within-task effort reallocation.

Table I1: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
Disaster Type × Human	0.0151	0.0342***	0.0273***	0.0282	0.0423**	0.0301**
	(0.0120)	(0.00902)	(0.00950)	(0.0173)	(0.0178)	(0.0151)
Disaster Type × Economic	0.0240**	0.0357***	0.00712	0.0298**	0.0183	−0.0263**
	(0.00943)	(0.00678)	(0.00747)	(0.0141)	(0.0155)	(0.0121)
Disaster Type × Infrastructure	0.0146*	0.0253***	0.0102*	−0.0111	−0.0101	−0.0164
	(0.00782)	(0.00511)	(0.00558)	(0.0177)	(0.0197)	(0.0167)
Disaster Type × Human	0.00428	−0.0360	−0.0247	−0.0296	−0.0417	−0.0409
× Free Media	(0.0200)	(0.0349)	(0.0180)	(0.0390)	(0.0416)	(0.0265)
Disaster Type × Economic	−0.00997	−0.0392*	−0.0163	−0.0445**	−0.0593**	−0.0356*
× Free Media	(0.0212)	(0.0210)	(0.0171)	(0.0224)	(0.0279)	(0.0198)
Disaster Type × Infrastructure	−0.0257**	−0.0296**	−0.0343**	−0.0519**	−0.0354	−0.0346
× Free Media	(0.0129)	(0.0147)	(0.0144)	(0.0221)	(0.0305)	(0.0273)
Free Media	−0.0250	0.200*	0.0771	0.105	0.246*	0.122
	(0.132)	(0.120)	(0.104)	(0.114)	(0.144)	(0.114)
Disaster Type	No. of Disast.	No. of Disast.	No. of Disast.	No. of Dis. Casualt.	No. of Dis. Casualt.	No. of Dis. Casualt.
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.930	0.925	0.936	0.930	0.925	0.936

Note: Standard errors clustered at country level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. I regroup World Bank sector classification into three: human capital, economic, and infrastructure. Human capital includes education, health, nutrition, population, poverty reduction, social development, and social protection. Economic groups economic policy, environment, finance, private sector, global information, and public sector governance. Infrastructure includes energy, mining, transport, urban development, water, and agriculture. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix J: Robustness to the Evaluation Measure

Dichotomization

In Table 3–5, I used the raw indicators of project performance in a 1-to-6 fashion. Here I replicate those regressions by defining a new binary measure of project success, which takes unit value if a project or a borrower or the bank receives a rating above median (around 4.3 for all projects). The results are in line with the previous finding and provide some intuitive reading of the main effects.

Table J1: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome	Borrower performance	Bank performance	Project outcome	Borrower performance	Bank performance
	(1)	(2)	(3)	(4)	(5)	(6)
No. of Disasters	0.00737**	0.0116***	0.00412	0.00767**	0.0125***	0.00470
	(0.00347)	(0.00267)	(0.00362)	(0.00342)	(0.00230)	(0.00326)
No. of Disasters × Free Media				−0.00340	−0.0101	−0.00663
				(0.00438)	(0.00622)	(0.00492)
Free Media	−0.0233	0.0243	−0.00930	−0.00875	0.0672*	0.0190
	(0.0385)	(0.0317)	(0.0284)	(0.0494)	(0.0388)	(0.0343)
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.112	0.131	0.128	0.112	0.132	0.128
Disaster Type	0.00226	0.00328	−0.00778*	0.170**	0.147**	0.124*
	(0.00533)	(0.00514)	(0.00431)	(0.0773)	(0.0607)	(0.0745)
Disaster Type × Free Media	−0.00966	−0.0167*	−0.00862	−0.215	−0.342***	−0.338**
	(0.00774)	(0.00870)	(0.00616)	(0.152)	(0.102)	(0.135)
Free Media	0.0146	0.0901*	0.0264	−0.0260	0.0231	−0.00756
	(0.0433)	(0.0461)	(0.0397)	(0.0378)	(0.0329)	(0.0290)
Disaster Type	No. of Casualties	No. of Casualties	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Observations	4,351	4,351	4,351	4,351	4,351	4,351
R^2	0.111	0.129	0.129	0.112	0.130	0.129

Note: Standard errors clustered at country level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Evaluator Bias

The World Bank might select better managers when there are disasters or emergencies. For this reason, in this section, I control for a manager fixed effect, though I lose many observations (around 500), because such information is not always available. Most results remain significant, even though the large increase in standard errors provoked by adding more than 2,000 variables reduces the strength of the significance, for example in the top panel of Table K1.

Table J2: World: Disasters and Media – OLS (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0107	0.0351**	0.00926	0.0104	0.0362***	0.0103
	(0.0115)	(0.0138)	(0.0182)	(0.0108)	(0.0124)	(0.0162)
No. of Disasters × Free Media				0.00324	−0.0133	−0.0122
				(0.0397)	(0.0411)	(0.0475)
Free Media	−0.144	−0.0338	−0.123	−0.156	0.0159	−0.0772
	(0.148)	(0.168)	(0.129)	(0.208)	(0.215)	(0.172)
Observations	3,886	3,886	3,886	3,886	3,886	3,886
R^2	0.619	0.600	0.597	0.619	0.600	0.597
Panel B						
Disaster Type	−0.0145	0.000465	−0.0178	0.571***	0.643***	0.530***
	(0.0201)	(0.0230)	(0.0225)	(0.192)	(0.220)	(0.191)
Disaster Type × Free Media	−0.0283	−0.0253	−0.00104	−0.703**	−1.241***	−1.260***
	(0.0414)	(0.0551)	(0.0451)	(0.355)	(0.473)	(0.345)
Free Media	−0.0405	0.0439	−0.125	−0.143	−0.0385	−0.111
	(0.238)	(0.252)	(0.183)	(0.147)	(0.174)	(0.125)
Disaster Type	No. of Casualties	No. of Casualties	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Observations	3,886	3,886	3,886	3,886	3,886	3,886
R^2	0.620	0.598	0.597	0.620	0.600	0.599

Note: This table reports OLS estimates. In both panels, the unit of observation is project level, and there are country, sector, year, and manager fixed effects. In Panel A, I focus on the number of disasters as the main regressor, while in Panel B, I focus on the number of casualties and disaster 90. Standard errors clustered at state level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called Disaster 90 (80/70) defined as a binary variable standing for disaster at the 90th (80th/70th) percentile; it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix K: Robustness to the Method

In Tables 3–5, I employed a simple OLS to analyze a variable that is typically ordinal. Here, I use an ordered probit estimator to account for the nonlinearity of each rating point; the results are in line with Tables 3–5 in terms of sign, magnitude, and significance.

Table K1: World: Disasters and Media – Ordered Probit (No Controls)

Variables	Project outcome (1)	Borrower performance (2)	Bank performance (3)	Project outcome (4)	Borrower performance (5)	Bank performance (6)
Panel A						
No. of Disasters	0.0156*	0.0279***	0.00515	0.0166**	0.0308***	0.007
	(0.00811)	(0.00648)	(0.00695)	(0.00804)	(0.00549)	(0.00609)
No. of Disasters × Free Media				−0.0118	−0.0336**	−0.0261**
				(0.0129)	(0.0139)	(0.0128)
Free Media	−0.0641	0.104	0.0125	−0.0132	0.248**	0.125
	(0.0992)	(0.0803)	(0.0800)	(0.128)	(0.103)	(0.0980)
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351
Panel B						
Disaster Type	0.00936	0.0118	−0.0144	0.397***	0.386**	0.211
	(0.0118)	(0.0092)	(0.010)	(0.146)	(0.150)	(0.140)
Disaster Type × Free Media	−0.0346*	−0.0437*	−0.0308	−0.455	−0.906***	−0.689*
	(0.0202)	(0.0247)	(0.0195)	(0.301)	(0.208)	(0.353)
Free Media	0.0755	0.276**	0.143	−0.0708	0.101	0.0188
	(0.117)	(0.130)	(0.108)	(0.0974)	(0.080)	(0.0793)
Disaster Type	No. of Casualties	No. of Casualties	No. of Casualties	Disaster 90	Disaster 80	Disaster 70
Mean Dep. Var.	4.139	4.236	4.358	4.139	4.236	4.358
Observations	4,351	4,351	4,351	4,351	4,351	4,351

Note: This table reports ordered probit estimates. In Panels A and B, the unit of observation is project level, and there are country, sector, and year fixed effects. Standard errors clustered at country level are shown in parentheses. Project outcome, borrower performance, and bank performance report a rating assigned by the World Bank project manager to the outcome of the project (outcome), the performance of the government (borrower), and the performance of the World Bank (bank); these are interpreted as measures of effort levels and project success. All are in ordinal units, ranging from 1 (highly unsatisfactory) to 6 (highly satisfactory). Their respective mean is reported in the Mean Dep. Var. row. The left-hand side variables are regressed over a measure of disaster and media freedom. The number of disasters is defined as the sum of disasters occurring in a country in a given year, as recorded in EM-DAT. The number of casualties is defined as the natural logarithm of one plus the sum of all disaster-related casualties occurring in a country in a given year, as recorded in EM-DAT. To account for extreme events, I also define a dummy variable called Disaster 90 (80/70) defined as a binary variable standing for disaster at the 90th (80th/70th) percentile; it takes unit value if a country in a given year exceeds the 90th (80th/70th) percentile of its distribution in both the number of disasters and the number of people killed as recorded in EM-DAT. The Free Media dummy takes unit value whenever a country in a given year is classified as free by Freedom House, and zero whenever it is classified as partially free or not free. No controls are included in this estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.