

# THE POLITICAL ECONOMY OF GOVERNMENT RESPONSIVENESS: THEORY AND EVIDENCE FROM INDIA<sup>1</sup>

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The determinants of government responsiveness to its citizens is a key issue in political economy. Here, we develop a model based on the solution of political agency problems. Having a more informed and politically active electorate strengthens incentives for governments to be responsive. This suggests that there is a role for both democratic institutions and mass media in ensuring that the preferences of citizens are reflected in policy. The ideas behind the model are tested on panel data from India. We show that state governments are more responsive to falls in food production and crop flood damage via public food distribution and calamity relief expenditure where newspaper circulation is higher and electoral accountability greater. JEL 012 , D72 , H11 , H41 , I38 , P26

## I. INTRODUCTION

Understanding what makes government responsive to citizens' needs is a key issue in political economy. It is particularly poignant in low-income countries where, in the absence of market opportunities, vulnerable populations rely in large measure on state action for their survival. A key issue is what institutions – economic, social and political – can be built to enhance the effectiveness of the state in social protection.

This paper lays out a framework for thinking about the issues and explores its empirical implications in an Indian context. Among other things, the approach highlights the importance of information flows about policy actions in increasing government responsiveness, particularly the role of mass media in creating an incentive for governments to respond to citizens' needs.

There are many reasons why the poor and vulnerable may not obtain the full attention of politicians even in a democracy where they have numerical strength. These groups are typically poorly informed and are generally less inclined to vote than richer and better educated citizens. A key question then is what institutions and mechanisms enable vulnerable citizens to have their preferences represented in policy. It is important that they have enough electoral power to “swing” outcomes if politicians are to be responsive to their demands. This is more likely to be true when electoral turnout is high and political competition is intense.<sup>2</sup> Mass media can play a key role by enabling vulnerable citizens to monitor the actions of incumbents and to use this information in their voting decisions.

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<sup>2</sup>These ideas are central to Key's [1950] seminal analysis of politics in the southern United States.

We use data from the sixteen major Indian states for the period 1958–1992 to test these ideas. India is an important case study for testing the political economy of responsiveness. It is home to a large vulnerable population which is regularly buffeted by natural shocks including droughts, floods, earthquakes and cyclones.<sup>3</sup> Over time, measures including public food distribution and calamity relief programs have been developed to deal with the vulnerability of the poor population. India is a federal democracy and popularly elected state governments play a key role in relief activities. There is a relatively free and independent press with significant time-series and cross-sectional variation.<sup>4</sup> Using these data, we are able to demonstrate a robust link between the development of mass media, political factors and government responsiveness.

The paper contributes to a nascent economics literature on the role of the media in influencing government behavior.<sup>5</sup> Strömberg [2000] develops a model where politicians commit *ex ante* to a vector of transfers. These transfers translate more effectively into votes where media is more active by increasing turnout. This paper focuses on the role of the media in mitigating political agency problems by providing information to voters.<sup>6</sup> This information is important for *ex post* evaluation of actions rather than to target *ex ante* commitments more finely. However, the ideas are broadly similar.

Strömberg [2001] analyzes the theoretical connection between news firms and political outcomes in a model in which political information is endogenously provided by profit maximizing media. Besley and Prat [2001] consider the possibility that incumbents will try to bribe the media to maintain their silence. They also endogenize media entry. They identify key determinants of media activity as the degree of commercialization, transactions costs between government and media and rents to holding political office.

Empirical work on the importance of the media is also developing. Brunetti and Weder [1999] and Ahrend [2000] find that press freedom is associated with lower levels of corruption in cross-country data. Djankov et al. [2001] focuses more directly on the effect of media ownership patterns on a variety of outcomes. They develop a remarkable data set on media ownership patterns in 97 countries to do so. Their main finding is that state ownership of the media is, on the whole, negatively correlated with good government. Besley and Prat [2001] use their data to look at the impact of media ownership on political turnover, finding that societies with more press freedom (and private media ownership) tend to have shorter tenure by politicians. They also find that foreign ownership of the media is an important variable. Strömberg [2000] relates New Deal spending in county level data for the United States to radio ownership, finding a positive association between the two which is consistent with his

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<sup>3</sup>Over the period an average of about half the population fell below the poverty line.

<sup>4</sup>A number of authors including Sen [1981, 1984] and Ram [1991] have pointed to the role that newspapers and open elections may play in preventing famines.

<sup>5</sup>The idea that a key role of the press is to inform the electorate is central to the political science literature on the role of mass media – see, for example, Brians and Wattenberg [1996] and Mondak [1995].

<sup>6</sup>This is also the approach taken by Besley and Prat [2001] which considers the possibility that media will be captured by government.

model of distributive politics.

The remainder of the paper is organized as follows. The next section lays out a theoretical structure as a vehicle for interpreting the results. Section three describes the institutional context for the empirical test and describes the data that we employ. Section four describes the methodology we employ to test the main ideas behind the model and presents the results. Section five concludes.

## II. THE MODEL

Political agency models where voters are imperfectly informed about government behavior are a natural vehicle for thinking through the role of the media as an information provider.<sup>7</sup> By being explicit about the micro-foundations of behavior, the model isolates the key ingredients behind the logic of responsiveness. The simple model can also generate a number of testable implications, not only about the role of media in enhancing responsiveness, but also about the role of turnover and incumbency (dis)advantage in promoting incumbent effort. We model the retrospective voting decisions by citizens who imperfectly informed about both the type and actions of the incumbent. We then show how this creates a mapping between incumbent effort and re-election incentives in which media activism plays a role.

Consider a two period model in which at the beginning of period one, an incumbent has been voted into office. Citizens are of two kinds: vulnerable and non-vulnerable – the former comprising a fraction  $\gamma < 1/2$  of the population. In period one, a fraction  $\beta$  of the vulnerable population experiences a shock which can be mitigated by public action – we refer to this group as needy. The politician can put in effort ( $e \in [0, E]$ ), measured in units of (dis)utility, to help the needy.

Incumbents can be one of three types. *Altruistic* incumbents (type  $a$ ) always put in the maximal effort level  $E$ ; *selfish* incumbents (type  $s$ ) never put in effort, i.e., set  $e = 0$ ; and *opportunistic* incumbents (type  $o$ ) put in effort if it enhances their re-election chances. The probabilities that each type of incumbent is selected ex ante are  $\{\mu_a, \mu_s, \mu_o\}$  respectively. To capture the value of re-election, let  $\Omega$  be the utility from holding office.

Incumbents' effort is not directly observable to vulnerable citizens. However, whether non-zero effort has been put in can be learned from one of two sources. Vulnerable citizens who are not needy in the current period can learn from the media. The extent of media activity is indexed by  $m$ . Let  $q(e, m)$  be the fraction of such citizens who are informed where  $q(0, m) = 0$ ,  $q_m(e, m) > 0$ ,  $q_e(e, m) > 0$ ,  $q_{em}(e, m) > 0$  and  $q_{ee}(e, m) < 0$ . Thus, information about effort is more likely to be learned when the incumbent has put in more effort. Greater media activity is assumed to increase the *marginal* impact of effort on the fraction that is informed. The learning technology for the needy citizens,  $p(e, m)$  is different – they may observe positive effort directly as well as from the media. Thus,  $p(e, m) > q(e, m)$ . We assume that  $p(0, m) = 0$ ,  $p_m(e, m) > 0$ ,  $p_e(e, m) > 0$ ,  $p_{em}(e, m) > 0$  and  $p_{ee}(e, m) < 0$ .

After information about effort is realized, there is an election in which a randomly selected challenger is faced by the incumbent. In the second term a random fraction

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<sup>7</sup>Political agency models in general are reviewed in Persson and Tabellini (2000) chapter four.

of the vulnerable citizens may again turn out to be needy. Since the opportunistic incumbents have no further re-election concerns, only the altruistic incumbents will put in effort in period two. For this reason the vulnerable citizens will prefer to vote for an incumbent who has been shown to have put in effort in period one, since such an incumbent is definitely not selfish.<sup>8</sup>

The fraction of the vulnerable population who have learned that their incumbent has put in effort in period one is

$$s(e, m, \beta) = p(e, m)\beta + (1 - \beta)q(e, m).$$

All of these citizens vote for the incumbent.<sup>9</sup> We assume that uninformed vulnerable citizens do not vote.<sup>10</sup>

All non-vulnerable citizens vote for the incumbent or the challenger for ideological reasons. However, due to natural turnover in the electorate and evolving politics on other issues, the fraction that will vote for the challenger on such grounds is stochastic. Let  $v$  be the fraction of voters who end up voting for the incumbent on ideological grounds. We assume that this is distributed uniformly on interval  $[a, 2b - a]$  where  $1 > b > a \geq 2b - 1$ . The parameter  $b$  is the expected level of support for the incumbent and  $a$  measures the size of the noise in voting.<sup>11</sup> A higher value of  $b$  increases the expected (ideological) votes for the incumbent.

The incumbent wins the election if

$$\gamma\sigma [p(e, m)\beta + (1 - \beta)q(e, m)] + (1 - \gamma)v > \frac{1}{2}.$$

where  $\sigma$  is the turnout rate among vulnerable voters in the election.<sup>12</sup> For a given  $b$ , the probability that the incumbent wins if he commits effort  $e$  is easily computed to be:

$$P(e; m, t, \beta, a, b, \sigma) = \begin{cases} 1 & \text{if } \gamma\sigma s > \left(\frac{1}{2} - (1 - \gamma)a\right) \\ \frac{(2b-a) + \frac{\gamma}{(1-\gamma)}\sigma s - \frac{1}{2(1-\gamma)}}{2(b-a)} & \text{if } \gamma\sigma s \in \left[\frac{1}{2} - (1 - \gamma)(2b - a), \frac{1}{2} - (1 - \gamma)a\right] \\ 0 & \text{if } \gamma\sigma s < \left(\frac{1}{2} - (1 - \gamma)(2b - a)\right). \end{cases} \quad (1)$$

An opportunistic incumbent chooses his effort level to solve:

$$\max_e \{P(e; m, t, \beta, a, b, \sigma)\Omega - e\}. \quad (2)$$

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<sup>8</sup>Using Bayes rule, the probability that the incumbent is altruistic given that a positive effort level has been observed and that opportunistic incumbents are putting in effort is  $\frac{\mu_a}{\mu_a + \mu_o} > \mu_a$ .

<sup>9</sup>We have not specified the preferences of the vulnerable citizens precisely. However, this would follow from rational behaviour under very weak conditions – essentially there is some value to incumbent effort and that there is a positive probability of being needy in period two.

<sup>10</sup>Our results would still go through if we assumed that uninformed vulnerable citizens voted randomly.

<sup>11</sup>This formulation is equivalent to  $v = b + \varepsilon$  where  $\varepsilon$  has mean zero and is uniformly distributed on  $[-b + a, b - a]$ .

<sup>12</sup>We are assuming here that this is known. It would be straightforward to extend the model to allow for this to be stochastic.

If the incumbent wins or loses for sure, then his optimal effort level is zero.<sup>13</sup> Looking at this key equation, it is clear that it is similar to the reduced form support maximizing model of Peltzman [1976]. However, the micro-foundations that we have given it will enable us to determine which factors drive the incumbent effort decision.

The first order condition for the optimal effort level, denoted  $e^*$ , (assuming an interior solution) is:

$$\frac{\gamma\sigma}{2(b-a)(1-\gamma)} [p_e(e^*, m)\beta + (1-\beta)q_e(e^*, m)]\Omega = 1. \quad (3)$$

Putting this together, we have the following result which summarizes the predictions of the model:

PROPOSITION Effort by an opportunistic incumbent is higher if

- (a) voters have greater media access (high  $m$ );
- (b) there is higher turnout in elections (high  $\sigma$ );
- (c) there is a larger vulnerable population (high  $\gamma$ );
- (d) the incumbent has a lower advantage (low  $b$ ).

A larger needy population raises incumbent effort if  $p_e(e, m) > q_e(e, m)$ .

PROOF: Using (1) in (2) and deriving the first order condition yields (3). To derive the comparative statics, define

$$h(e, m, t, \beta, \alpha, \sigma) = \frac{\gamma\sigma}{2(b-a)(1-\gamma)} [p_e(e^*, m)\beta + (1-\beta)q_e(e^*, m)]$$

and recall that

$$\text{sign} \left\{ \frac{\partial e^*}{\partial \rho} \right\} = \text{sign} \{h_\rho\} \text{ for } \rho \in \{m, t, \beta, \alpha, \sigma\}.$$

The result now follows routinely by differentiating the function  $h(\cdot)$  after recalling that  $q_{em} > 0$  and  $p_{em} > 0$ . QED

This result relies on an interior solution. If  $b$  is small enough relative to  $a$ , then the incumbent will lose for sure and if  $a$  is large enough, then he will win for sure. Thus, the existence of an interior solution for effort for an opportunistic politician hinges on there being a sufficient political competition, i.e. not too great an advantage or disadvantage for the incumbent. Thus apart from the effect of  $b$  on equilibrium actions as described in the Proposition, the right amount of political competition is a precondition for any kind of responsiveness by opportunists.

It is these predictions of the model that we will bring to the data as it gives a mapping from institutional features into incumbent effort. Intuitively, the reasons for the results are clear. Greater media activity raises the marginal value of effort because it is more likely that the reports of such effort will find their way to voters. Greater turnout increases the effectiveness of effort by turning it into support at the ballot

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<sup>13</sup>This is guaranteed *not* to be the case if  $b = 1/2$  and  $a = 0$ . This denotes a case of a wide open election where neither the incumbent nor the challenger has an advantage.

box. The same is true when the vulnerable population is larger. Effort is higher when there is a greater density of voters at the critical value of  $v$  which flips the election in the incumbent's favor. A lower value of  $b$  raises this density – this incumbency advantage is best thought of as measuring the state of political competition, with more intensive political competition increasing the incumbent's effort incentive. Finally, if it is more likely that effort will be observed by the population who actually experience the shock, then a larger shock will increase effort incentives. Though not strictly predicted by the theory it will also be interesting to examine whether governments are more responsive nearer election times.<sup>14</sup> This would follow if there were a higher political payoff to being responsive nearer elections.

To summarise, the model creates a link between incumbent and actions and re-election incentives by supposing that voters use observations about incumbent effort as information about the incumbent's underlying type. These incentives work best for opportunistic incumbents who, while not benevolent, are willing to respond when it is in their interest to do so. By putting effort, they can distinguish themselves from “dead-beat” incumbents who do not respond at all and they are more willing to do this when their actions are visible.

The theory takes media effectiveness as exogenous to the political process. Besley and Prat [2001] develop a model which makes the presence and effectiveness of the media endogenous. Among other things, the transactions costs between the media and the government determine how freely the media operates. Following Djankov et al [2001], they suggest that media ownership may be a way to proxy for these transactions costs. For example, state owned media can be silenced more easily than privately owned media. Following this general line of argument, we will suggest below an approach to treating access to media as endogenous.

### III. BACKGROUND AND DATA

We test the model by looking at determinants of the public distribution of food and state government expenditures on calamity relief. Both the public food distribution and calamity relief systems in India were set up in part to deal with the threat posed by famine and other natural calamities.<sup>15</sup> The public food distribution system now involves large-scale government involvement in the procurement, storage, transportation and distribution of food grains and provides state governments with the ability to respond to both chronic and temporary food insecurity [Radhakrishna and Subbarao, 1997]. Calamity relief expenditures by state governments covers a range of direct relief measures including drinking water supply, medicine and health, clothing and food, housing, veterinary care and assistance for repair and restoration of damaged property [Government of India, 1990].

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<sup>14</sup>The model also predicts that an incumbent should be less responsive were he not subject to re-election incentives. While there are no term limits in India to test this with, it is interesting to note that Besley and Case [1995] find that US states where the governor faces a binding term limit are less responsive to natural disasters – a finding which is consistent with the theory presented here.

<sup>15</sup>For a large part of its history the state in India had limited success in dealing with natural disasters, leading to the death of millions [see Sen, 1981; Dreze 1991; Dreze and Sen, 1989].

The codes that govern public distribution of food and calamity relief in India stem from the Famine Relief Codes put in place after 1880.<sup>16</sup> They emphasize the need for local administrators to look for signs, such as large drops in food production and increases in food prices, which signal an impending crisis. The aim is to respond by increasing the public distribution of food and through the setting up of public works programs and relief centres to prevent hardship. Before Independence in 1947, it is clear that the existence of these guidelines did not guarantee their early and energetic implementation.<sup>17</sup> Following Independence in 1947, the introduction of representative democracy and the rise of mass media, it is argued, has helped to strengthen accountability and ensure effective implementation of public food distribution and calamity relief programs [see Sen, 1984; Dreze and Sen, 1989].<sup>18</sup> Elected state governments assumed responsibility for relief operations and there was large increase in regional papers published in languages other than English or Hindi which are more likely to report on government responses to local shocks [see Jeffrey, 2000]. Readership of regional newspapers will also tend to comprise local vulnerable populations who rely on action by state governments for protection.

The newspaper industry that developed was distinguished from the bulk of other low income countries by being relatively free and independent.<sup>19</sup> The press in India has been ascribed a major role in monitoring the actions of politicians and in ensuring their responsiveness to droughts and floods which occur at frequent intervals.<sup>20</sup> Using panel data from 1958-1992 we are able to provide a robust test of whether mass media and political institutions play a role in ensuring that state governments are responsive to the social protection needs of their citizens.

Table I gives means and standard deviations of the main variables that we use averaged for the 1958-1992 period and arrayed by state.<sup>21</sup> This illustrates the significant variation across the states in terms of government responses, indicators of need, newspaper circulation and political outcomes. The first and second columns of Table I consider our two measures of government responsiveness to citizens' needs.

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<sup>16</sup>Frequent and severe famines during both the 18th and 19th centuries were a major source of concern to the British Administration which came to power in 1858. This led to the setting up of Famine Commissions, most notably that of 1880, which produced a set of Famine Codes – detailed guidelines for local administrators about the anticipation, recognition and relief of famines and other natural calamities.

<sup>17</sup>There were major famines in 1896-1897, 1899-1900 and 1943.

<sup>18</sup>The lack of democracy and of freedom of information have been pointed to as reasons behind why China experienced a major famine between 1958 and 1961 with excess mortality figures ranging between 16.5 and 29.5 million whereas India has not experienced a major famine in the post-Independence era [see Dreze and Sen, 1989].

<sup>19</sup>For example, Ram [1991, page 188] observes that “the Indian press is widely regarded as the most pluralistic, the least inhibited and the most assertive or independent in all the Third World”. Only 2% of newspapers in India are owned by central and state governments. This is in strict contrast to TV and radio which were mainly under state control during the 1958-1992 period.

<sup>20</sup>Ram [1991, page 186] describes it's role in averting crisis as follows: “Over time, it has tended to bring out the facts in the field with elements of vivid descriptive and human interest detail; and to expose the failure of government authorities to recognize the problem, its causes and early symptoms, and to respond quickly and adequately in terms of crisis prevention, management, and relief.”

<sup>21</sup>Detail on the construction and sources of these variables are contained in a Data Appendix.

Public food distribution per capita varies seven fold between Madhya Pradesh (low) and Kerala (high). Calamity relief expenditure also exhibits pronounced variation across states.

The need for government intervention will be proxied by food grain production per capita in a state and real per capita flood damage to crops. The third and fourth columns of Table I show that there is pronounced cross-sectional and time-series variation in both of these variables. To illustrate this, we have graphed these variables against time (for each state) in Figures I and II. Below, we show that these measures of need are significantly related to rainfall variation.

Media development will be proxied by newspaper circulation both in aggregate and broken down by language of circulation. While crude, we believe that it is likely to capture well the flow of information about policy to citizens. Figure III makes clear that the level of newspaper penetration varies markedly across space and time – variation that we exploit in the econometric analysis. Figure III illustrates that circulation in Kerala is highest and has grown most quickly during the period. Circulation levels tend to be higher in Tamil Nadu, Maharashtra, Karnataka, Punjab and West Bengal and lower in Bihar, Uttar Pradesh, Orissa, Madhya Pradesh and Rajasthan. Table I also shows that there is pronounced cross-state variation in newspaper circulation broken down by language of circulation. This combined with time series variation can be used to identify the impact of circulation on responsiveness.

India is a federal democracy. As is apparent from Table I there is also pronounced variation across states in terms of the functioning of state level political systems. Electoral turnout in elections to state level assemblies (*Vidhan Sabha*) over the period is high (60.9 percent) indicating that the Indian population has been politically active as a whole. There is, however, considerable variation across states. Orissa for example registered a turnout of 44.9 percent over the period whereas the corresponding figure for Kerala was 77.6 percent. Political competition has been intense over the period. Congress has been the dominant party over the period though in each and every state there have been numerous switches between Congress and various competitors (see Data Appendix and the Appendix Table). Over the period minus the absolute difference between proportion of seats occupied by Congress and its main competitor(s) has been largest for Kerala ( $-0.15$ ) indicating the most intense political competition and smallest for Maharashtra ( $-0.67$ ) denoting the least political competition. Variation along these different dimensions will be exploited to examine how politics affects government responsiveness.

## IV. EMPIRICAL ANALYSIS

### A. Method

Our basic method is to run panel data regressions for states  $i$  and years  $t$  of the following form:

$$g_{it} = \alpha_i + \beta_t + \delta s_{it} + \gamma(s_{it})(z_{it}) + \phi z_{it} + u_{it} \quad (4)$$

where  $\alpha_i$  and  $\beta_t$  are state and year fixed effects and  $z_{it}$  is a vector of economic, political and media variables that we might expect to affect government responsiveness ( $g_{it}$ ). This specification allows the right hand side variables  $z_{it}$  to enter both as level terms and interacted with variables which capture the need for state intervention ( $s_{it}$ ).

In terms of the theory, we think of the variable  $s_{it}$  proxying for  $\beta$  – the fraction of the needy population. We will introduce the other variables that Proposition 1 suggests should affect responsiveness as elements of the vector  $z_{it}$ .

Our first task is to define policy response systems to test the predictions. We begin by considering how extreme rainfall conditions affect food grain production and flood damage variables ( $s_{it}$ ). This underlines our use of these variables as exogenous shocks to needs for state intervention. We then examine whether these variables ( $s_{it}$ ) affect two different measures of government protection ( $g_{it}$ ) – public food distribution and calamity relief expenditure.

Proxies of economic development, that might capture the technological capacity of state governments to respond, are then incorporated as elements of  $z_{it}$ . The vector  $z_{it}$  is then extended to include media and political variables – specifically newspaper circulation, electoral turnout, political competition and the timing of elections. We look at both aggregate newspaper circulation as well as circulation disaggregated by language. In all cases, we consider an array of interactions between the media and political elements of  $z_{it}$  and the food production and flood damage variables ( $s_{it}$ ) which capture the need for state intervention. We also consider whether the results on the importance of newspapers hold up when these are instrumented using media ownership data.

In what follows we first present results that concentrate on the level effects,  $\phi$ , in equation (4). In the case of public food distribution, these effects represent determinants of efforts by state governments to address chronic food insecurity of households. They may also measure responses to shocks not captured by the food grain production measure. In the case of calamity relief expenditure, they are most likely picking up shocks other than floods to which such expenditures are targeted.<sup>22</sup> We refer to these level effects as government *activism*. While interesting, the connection of general activism to the theory is less direct than for *responsiveness* which is better captured by the coefficient ( $\gamma$ ) on the interaction with the shock ( $s_{it}$ )( $z_{it}$ ).<sup>23</sup> These coefficients pick up whether having greater newspaper circulation, higher turnout or more intense political competition makes state governments more responsive to the need for state intervention.

### B. Policy Responses

Table II shows that food grain production and flood damage are significantly driven by extreme rainfall conditions controlling for state and year fixed effects. The latter are measured by two variables – drought and flood – which are set equal to one if the annual average rainfall is more than two standard deviations below (drought) or above (flood) the state specific rainfall mean for the period 1958-1992. Column (1) of Table II shows that droughts are associated with a significant fall in food grain production per capita whereas the flood variable has no discernible impact. Column (4) shows that flood damage is positively related to extremely high rainfall

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<sup>22</sup>The calamity relief system is designed to deal with a range a of natural disasters including floods, droughts, earthquakes and cyclones.

<sup>23</sup>Note, however, that if there is a permanent fraction of needy in each state, then the level effects in equation (4) are quite consistent with predictions of the model.

and negatively related to droughts. This increases our faith that the variables that we using to capture the need for public action are both meaningful and contain a significant exogenous component.

Turning now to government reactions, we use data on public food distribution and calamity relief expenditure. Reactions to variations in food production and flood damage are in columns (2), (3), (5), and (6). Column (2) displays a negative association between public food distribution and food grain production. However, public food distribution appears to be unrelated to flood damage (column (3)). Columns (5) and (6) suggest that calamity relief expenditure responds positively to flood damage, while being largely independent of food grain production. This gives us two well-defined policy response systems on which to base our analysis. Results are thus presented in separate panels in the tables that follow.

### *C. Determinants of Government Activism*

We next consider the economic, media and political determinants of government activism. The results in Table III include state income per capita, urbanization, the log of total population, population density and revenue from the center as proxies for the *capacity* of governments to respond. We might expect richer states to have more developed response mechanisms. Population density, urbanization and log population should also reflect the ease of reaching target populations. States receiving greater per capita revenue transfers from the center may also be more capable of responding to shocks. Surprisingly we find no impact of state income on either public food distribution or calamity relief expenditures. The same follows for revenue from the center and population density. Column (1) suggests that more urbanized states have higher levels of public food distribution. This effect, however, disappears when we control for media and political variables (columns (2) and (3)). Having a larger population does appear to be correlated with lower per capita public food distribution. In column (4) we observe that none of these factors appear to affect calamity relief expenditures.<sup>24</sup> Overall, these results suggest that economic factors have a limited influence on government responsiveness.<sup>25</sup>

Columns (2) and (5) look at whether newspaper circulation explains responsiveness. They reveal a positive correlation between newspaper circulation levels and our two measures of government responses.<sup>26</sup> The effects are large and significant – a 1

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<sup>24</sup>Columns (5) and (6) suggest that, when we control for media and political variables, calamity relief expenditures are negatively correlated with urbanisation and population density. This may reflect a greater need for this type of spending in less urbanised and less densely populated states.

<sup>25</sup>Of course, the fixed effects may be proxying for long-run economic differences between states. We also find that, controlling for state and year effects, public food distribution and calamity relief are uncorrelated with poverty as measured by the headcount ratio. This suggests that these are policies that equip citizens with some degree of protection against adverse events as opposed to being highly redistributive in nature. This is in line with the widely held view that though the size of recurrent transfers in the public distribution system are not large enough to influence chronic poverty the system has an important role to play in protecting citizens from short term food crises [see Dreze 1991; Radhakrishna and Subbarao, 1997].

<sup>26</sup>We get similar results if we use average newspaper circulation 1958-1992 as a regressor and do not include year effects. This helps to reduce the concern that newspaper circulation is being driven by the frequency of shocks in different states.

percent increase in newspaper circulation is associated with a 2.4 percent increase in public food distribution and a 5.5 percent increase in calamity relief expenditures. Moreover, the result is robust to controlling for the political variables introduced in columns (3) and (6). States with higher levels of media development are thus more active in protecting vulnerable citizens. This is consistent with the theoretical idea that this is due to improvements in political accountability.

We next consider a number of political factors that might encourage politicians to increase their effort in protecting vulnerable citizens. Greater electoral turnout can serve as a proxy for the general level of political activism and hence the likelihood that voters will reward incumbents who perform well. We thus include turnout in state elections lagged one period as an explanatory variable. The theory showed why effort may be enhanced where political competition is more intense and incumbents are less secure. We measure this by the absolute difference between the number of seats held by Congress, the dominant party over the 1958-1992 period, and its main competitor (see the Appendix Table). Finally we consider whether, given that voters may have better memories about recent events, state governments are more active near elections. To look at this we create a dummy for whether it is an election or pre-election year.

Columns (3) and (6) of Table III report the specification that includes these political variables. Turnout in the previous election does not affect responsiveness of state governments. Greater political competition is associated with higher levels of public food distribution.<sup>27</sup> However, this is not the case for calamity relief. Public food distribution, but not calamity relief, is higher during election and pre-election years. (The coefficient corresponds to a 15 percent increase in public food distribution in election and pre-election years.) Levels of public food distribution respond to political competition and the timing of elections whereas calamity relief does not. This is consistent with public food distribution being a highly visible, and hence politicized, means of dealing with food insecurity [see Radhakrishna and Subbarao, 1997].

Overall, the results point to the centrality of mechanisms for improving accountability beyond the role of economic development as a means of encouraging government activism. This resonates with recent calls to improve “governance” in low income countries as a means of enhancing the well-being of the poor [see World Bank, 2000].

#### *D. Newspapers and Responsiveness*

We now look at the role of media in greater detail. The basic results are those in columns (1) and (5) of Table IV. Newspaper circulation now enters both as a level term and interacted with the food production and flood damage variables which capture the need for state intervention. We maintain the full set of controls from columns (3) and (6) in Table III.

The interaction terms are significant for both policy response systems. Thus, a given fall in food production yields more public action in situations where newspaper

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<sup>27</sup>This idea is consistent with the empirical evidence from the U.S. by Holbrook and van Dunk [1993].

circulation is higher. Similarly, a given level of crop damage due to floods yields more calamity relief expenditures when newspaper circulation is higher. Thus, higher newspaper circulation is associated with government being more responsive to falls in food production and flood damage.

To give some idea of the magnitudes involved, a 10 percent drop in food production is associated with a 1 percent increase in public food distribution in states which are at the median in terms of newspaper circulation per capita. However, for states that are in the 75 percent percentile in terms of newspaper circulation per capita we find that a 10 percent drop in food production is associated with a 2.28 percent increase in public food distribution.

These results are consistent with the theory – a given shock will be responded to more by an incumbent when media is more highly developed. The interaction terms are also less likely to be due to an omitted “social development” or “social capital” factor that is correlated with newspaper circulation.

To further underline our interpretation of the data, recall that food grain production is significantly affected by droughts (Table II, column (1)). We used this fact to look purely at the “shock” component in food grain production by running a regression of food grain production on state and year fixed effects, and the drought and flood variables. We then took this predicted value and used it in place of the food grain production variable to explain the level of public food distribution. Interestingly, as shown in Table IV column (2), the level of this variable does not explain public food distribution. However, there is a significant interaction term between this variable and newspaper circulation. Moreover, the size of the coefficient estimated is very similar to those in the regressions that have actual food grain production per capita in the interaction terms. This supports our interpretation of the interaction terms as responsiveness to shocks and the level terms as representing redistribution to deal with long-run food imbalances (activism).<sup>28</sup>

We now consider results where newspaper circulation is disaggregated by language. India is a linguistically diverse country and the large array of languages in which newspapers are published is symptomatic of this. In our data set we have annual circulation broken down into nineteen different languages.<sup>29</sup> Hindi and English are the two languages that have greater national coverage, the others tending to be concentrated in particular states. With growing literacy following Independence there has been a dramatic rise in circulation of newspapers published in these regional languages (Jeffrey, 2000). It is more likely that newspapers published in languages that are state specific will report localized events. Readership of regional newspapers will also tend to comprise local vulnerable populations who rely on action by state governments for protection. Taken together these two factors suggest that local language newspapers may play a greater role in making state politicians more responsive

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<sup>28</sup>This interpretation is further underlined by omitting the states that have a significant time trend in food production from the analysis. In this case, the interaction term with newspapers remains significant while the level of food production per capita is not significant. We are grateful to a referee for suggesting exploring this.

<sup>29</sup>These are: Assamese, Bengali, English, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Marathi, Manipuri, Nepali, Oriya, Punjabi, Sanskrit, Sindhi, Tamil, Telugu and Urdu.

to local crises than newspapers published in English in Hindi.

Patterns of the evolution of newspaper readership broken down by language vary considerably by state. For example, the state of Kerala that has had rapid increase in newspaper circulation has mainly done so by increasing circulation of titles in local languages. Overall, circulation of English newspapers has not increased over the period while Hindi newspapers have increased their circulation by 5.8 percent per annum. However, this varies from a 24 percent annual growth rate in Assam to a 17 percent annual reduction in Karnataka. Overall, non-English, non-Hindi newspaper circulation grows at 1.7 percent with a 7 percent growth rate in Bihar and small declines in three states. This time series variation combined with differences in the characteristics of newspapers published as regards scope and audience can be exploited to more robustly identify media effects.

Results in Table IV permit three categories of newspaper circulation to enter into the analysis. Columns (3) and (6) of Table IV enter these variables as levels where we find that “other” newspaper circulation drives government activism – neither English or Hindi circulation are associated with higher levels of public distribution or calamity relief at the state level. Columns (4) and (7) permit interaction terms with the food production and flood damage terms confirming the idea that it is “other” newspaper circulation that drives the results. Interaction terms for both Hindi and English newspapers are both insignificant.

These findings make sense as we are studying responses by *state* governments where the role of more localized press would likely be more important. Moreover, it also seems reasonable to suppose, in line with our theory, that, due to language barriers, the vulnerable citizens are less likely to have access to publications in Hindi and English in most states where local languages are the *lingua franca*. Hence, regional presses, which also have a greater incentive to cover local issues, are at the heart of why media development encourages government responsiveness.

The results are also persuasive as the particular category of newspapers driving the results is much less likely to be driven by a monolithic omitted “social development” variable which is correlated both with government responsiveness and newspaper circulation. It is difficult to identify omitted variables (demand, social development, education) that would be correlated with “other” circulation but not with English or Hindi circulation.

All of this notwithstanding, a concern may remain that what we are finding is really not due to newspapers increasing political accountability, but due to some correlation between newspaper circulation and the error. We now consider an instrumental variables approach which tackles this head on. This draws on theory by Besley and Prat [2001] which develops an approach where press freedom is determined endogenously depending on how easily governments can capture the media. They argue that ownership of the media can affect press freedom since it will affect the cost of government suppressing the press.<sup>30</sup> Besley and Prat [2001] find some supporting evidence for this idea in cross-country data.

In an Indian context, we also find that the ownership structure of the media is correlated with newspaper circulation. If media owned by the state or by political

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<sup>30</sup>These ideas square also with recent results in Djankov et al [2001].

parties are more susceptible to political influence, then the news that they carry will be regarded as less credible, leading to a lower level of newspaper circulation. We therefore use newspaper ownership as an instrument for newspaper circulation. This will work provided that the forces that shape ownership differences are not a direct determinant of government responsiveness.

To implement this, we collected detailed annual data on who owns newspapers in Indian states for the period 1958-1992.<sup>31</sup> Most newspapers in India are owned by individuals or registered societies and associations. State ownership is uncommon comprising less than 2 percent of all titles. In columns (3) and (6) of Table V we regress newspaper circulation on different ownership shares as well as political controls, economic controls and state and year effects. State ownership along with an amalgam of minor ownership forms is the omitted category. We observe effects that are consistent with the Besley-Prat [2001] theory – greater ownership by registered societies and associations, a widely held form of private ownership tends to enhance circulation as does individual ownership to a lesser extent. In contrast greater ownership by political parties tends to depress circulation. The  $F$  tests in Table V indicate that these instruments are jointly significant indicating that they do a decent job in explaining differences in newspaper circulation. The results in columns (3) and (6) also confirm that neither food grain production and nor flood crop damage drives newspaper circulation. Thus we are not picking up an effect due to both needs and newspaper circulation both rising together in times of need.

Columns (1) and (4) of Table V report results where ownership variables instrument for newspaper circulation. These instruments comfortably pass overidentification tests suggesting that it may be reasonable to suppose that ownership drives circulation without explaining variations in responsiveness. In both columns (1) and (4) we continue to observe that higher newspaper circulation is associated with greater government activism in both public food distribution and calamity relief. Columns (2) and (5) also include the predicted circulation level interacted with the variables which capture the need for state intervention. These show that, for a given fall in food production or level of flood damage, having greater newspaper circulation is associated with greater government responsiveness. Comparing Tables IV and V it is notable that coefficients on media are actually much larger when we instrument. This is more consistent with an attenuation bias (measurement error) story than an endogeneity story.

Overall, these results suggest a rather persuasive role for newspapers in driving greater government responsiveness in a way that the theory suggests should be the case.

### *E. Politics and Responsiveness*

We now delve deeper into the role of the political variables in driving responsiveness, by interacting the political variables from Table III with the food production and flood damage variables. The results are in Table VI.

Columns (1) and (4) suggests that greater electoral turnout is associated with

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<sup>31</sup>The data that we have obtained is for the fraction of titles in each ownership category – circulation data at this level of disaggregation is not available.

greater responsiveness – as food production falls or as flood damage increases, having higher turnout in the previous election tends to increase the responsiveness of governments to these events. This is consistent with the idea that electoral threats will tend to be greater where states have a greater tradition of turning out to vote.

Columns (2) and (5) include interactions between our political competition variable (which is defined as minus the absolute difference between seats occupied by the ruling party and its main competitor) and the food production and flood damage variables. We find here that, for a given fall in food production or level of flood damage, having greater political competition leads to greater public food distribution and calamity relief.<sup>32</sup> Consistent with the theory, greater political competition is associated with increased government responsiveness. Columns (3) and (6) introduce an interaction term for the election and pre-election year effects. These do not appear to influence responsiveness.<sup>33</sup>

Together these results confirm the importance of politics to the relief process. Overall, political effects are more pronounced for food distribution than for calamity relief. This is understandable given that the public food distribution system is a larger, more politicized operation. Ration shops which operate during both shock and non-shock periods are viewed as key source of social protection for the poor and vulnerable against both chronic and transitory food insecurity and are a subject of intense political debate and scrutiny. In contrast, calamity relief expenditure being both limited to shock periods and benefiting a smaller fraction of the electorate are likely to attract relatively less political attention.

## V. CONCLUSIONS

An effectively functioning democracy has many facets. Among them is the possibility of creating incentives for elected officials to respond to citizens' needs. In this paper we have argued that mass media and open political institutions can affect government activism and responsiveness. This contrasts with economic development which appears to be relatively unimportant in our data. Elections provide an incentive for politicians to perform which can be enhanced by development of the media. Through this mechanism we would expect responsiveness of the government to salient issues such as crisis management to be greater where the media is more developed.

India is a key place to test these ideas – combining an active press with a large vulnerable population which is regularly buffeted by natural shocks. Moreover, the sheer size of the Indian population make the welfare consequences public action or inaction of high order.

Our results relate to an earlier literature which examines the importance of the media in famine relief policy [see Ram, 1991]. Perhaps the most famous pronouncement on this subject was in Amartya Sen's 1981 Coromandel lecture published as Sen [1984]. He observes that:

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<sup>32</sup>The latter effect is only significant at the 10% level.

<sup>33</sup>Inclusion of the various interaction terms does not lead to significant changes in the other included regressors. In particular, the coefficient on newspaper circulation per capita remains robustly positive and significant.

“India has not had a famine since independence, and given the nature of Indian politics and society, it is not likely that India can have a famine even in years of great food problems. The government cannot afford to fail to take prompt action when large-scale starvation threatens. Newspapers play an important part in this, in making the facts known and forcing the challenge to be faced.” page 84.

Our results are consistent with this assessment. However, they highlight how a number of other factors, including turnout, political competition and the timing of elections affect how governments respond. In addition, the results highlight the importance of local language newspapers in transmitting information. Thus representative democracy and the development of free and independent regional presses appear as key factors in ensuring protection for vulnerable citizens.

The empirical results can be accounted for by a simple theoretical model where governments with an eye on their re-election chances. The role of the media enhances their incentives to do so by more closely tying their actions to voting outcomes.<sup>34</sup> Moreover, a number of other implications of the model are corroborated in the data.

There is scope for further work that tries to link government policy to media development, especially in developing countries. In an Indian context, there may be other policies that respond to media development. Our results also underline the potential role of civil society, media being a key branch, to an effectively functioning democracy. The formal institutions of political competition (such as open elections) are not sufficient to deliver a responsive government unless voters have the real authority to discipline poorly functioning incumbents. This requires effective institutions for information transmission to voters.

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<sup>34</sup>This is similar to the conclusion of Stromberg [2000] although he emphasises a model with ex ante commitments rather than a more backward looking process of evaluation by voters.

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## DATA APPENDIX

The data used in the paper come from a wide variety of sources.<sup>35</sup> They cover the sixteen main Indian states listed in Table I and span the period 1958-1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. Magnitudes are deflated using the **Consumer Price Index for Agricultural Laborers** (CPIAL) and **Consumer Price Index for Industrial Workers** (CPIIW). These are drawn from a number of Government of India publications which include Indian Labour Handbook, the Indian Labour Journal, the Indian Labour Gazette and the Reserve Bank of India Report on Currency and Finance. Ozler, Datt and Ravallion [1996] have further corrected CPIAL and CPIIW to take account of inter-state cost of living differentials and have also adjusted CPIAL to take account of rising firewood prices. The reference period for the deflator is October 1973- March 1974. **Population** data used to express magnitudes in per capita terms comes from the 1951, 1961, 1971, 1981 and 1991 censuses [Census of India, Registrar General and Census Commissioner, Government of India] and has been interpolated between census years. Separate series are available for urban and rural areas.

**Food Grain Production** is total food grain production measured in tonnes from the Bulletin on Food Statistics, Ministry of Food and Agriculture, Directorate of Economics and Statistics, Government of India. This is expressed in per capita terms.

**Flood Damage** is from state-wise data on the value of crops affected by floods measured in rupees from the Central Water Commission, Government of India. This is expressed in real per capita terms.

**Public food distribution** is food grains measured in tonnes distributed via the Public Food Distribution system and comes from the Bulletin on Food Statistics, Ministry of Food and Agriculture, Directorate of Economics and Statistics, Government of India. This is expressed in per capita terms.

**Calamity relief expenditure** comes from the social expenditure series in state expenditure accounts is published on an annual basis in the Reserve Bank of India Bulletin, Reserve Bank of India, Bombay, India. This is expressed in real per capita terms.

**Drought and flood** are dummy variables for when annual average rainfall is two standard deviations below or above or below the state specific rainfall mean 1958-1992. Rainfall data are from the Statistical Abstract of India, Government of India.

**Newspaper circulation** is the average number of copies of newspapers/periodicals sold or distributed free per publishing day and from Press in India, Annual Report of the Registrar of Newspapers for India, Ministry of Information and Broadcasting, Government of India. This information is also available from the same source broken down by language and we have constructed three groupings: English, Hindi and

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<sup>35</sup>Our analysis has been aided by Ozler, Datt and Ravallion [1996] which collects published data on poverty, output, wages, price indices and population to construct a consistent panel data set on Indian states for the period 1958 to 1992. We are grateful to Martin Ravallion for providing us with this data. To these data, we have added information on newspapers, political representation and public policies pursued by states.

“other” which includes newspapers/periodicals published in Assamese, Bengali, Gujarati, Kannada, Kashmiri, Konkani, Malayalam, Marathi, Manipuri, Nepali, Oriya, Punjabi, Sanskrit, Sindhi, Tamil, Telugu and Urdu. From the same source we also have data on **ownership of newspapers**. Newspapers are classified as belonging to one of twelve ownership types (central government, state government, individual, public joint stock company, private joint stock company, firm or partnership, trust, society or association, educational institution, international organization, political party or foreign mission). Individual and society or association are the dominant forms of ownership accounting for 84 percent of newspaper titles in India. Newspaper ownership is expressed as a share of total newspaper titles.

**Turnout** is turnout in state elections, which take place on average every four years, from Butler, Lahiri and Roy [1991]. This variable is held constant between elections. The regressions use turnout lagged one period.

**Political competition** is defined as minus the absolute difference between the proportion of seats occupied by the Congress party (which has been the dominant party over the period) and the proportion occupied by its main competitor(s). A larger value thus indicates greater political competition. The Appendix Table gives the party cleavages used. The Congress Party has been the dominant political force over the period. The main political threat over the period has come from the Janata grouping of parties. In six states, Andhra Pradesh, Assam, Jammu & Kashmir, Orissa, Punjab and Tamil Nadu, Congress has also been competing with state-specific Regional parties. In three states, Madhya Pradesh, Rajasthan and Uttar Pradesh, Congress is in competition with the Bharatiya Janata Party which has a non-secular Hindu orientation and has been growing in importance over time. In two states, Kerala and West Bengal, Congress has been competing for political power over the period with Hard Left parties. The data on seats held by different political parties is from Butler, Lahiri and Roy [1991].

**Election dummy** is a variable that is equal to one in years in which there is a state legislative election and the year before. This is from Butler, Lahiri and Roy [1991].

**State income** comes from Estimates of State Domestic Product published by Department of Statistics, Department of Statistics, Ministry of Planning, Government of India. This is deflated and expressed in per capita terms. The regressions use the logged value of real state income per capita.

**Ratio of urban to total population** is a measure of how urbanized a state is and is constructed using data which is interpolated between the 1951, 1961, 1971, 1981 and 1991 censuses [Census of India, Registrar General and Census Commissioner, Government of India]

**Population density** takes interpolated total population data from the Census and divides this by total land area of each state using data from Census Atlas of India, Registrar General & Census Commissioner, Office of the Registrar General, Government of India.

**Log population** is the log of total population.

**Revenue from centre** is the share of state revenue obtained from the centre. This revenue comes from three central taxes: (i) union excises, (ii) corporate and individual income taxes and (iii) estate taxes – the former two being the major taxes which are

shared with the states. Together revenue from these taxes accounts for 33 percent of state total taxes in the states across the 1958-1992 period. The source of this data is Public Finance Statistics (Ministry of Finance, Government of India). This information is also collated in the Reserve Bank of India's annual publication Report on Currency and Finance.

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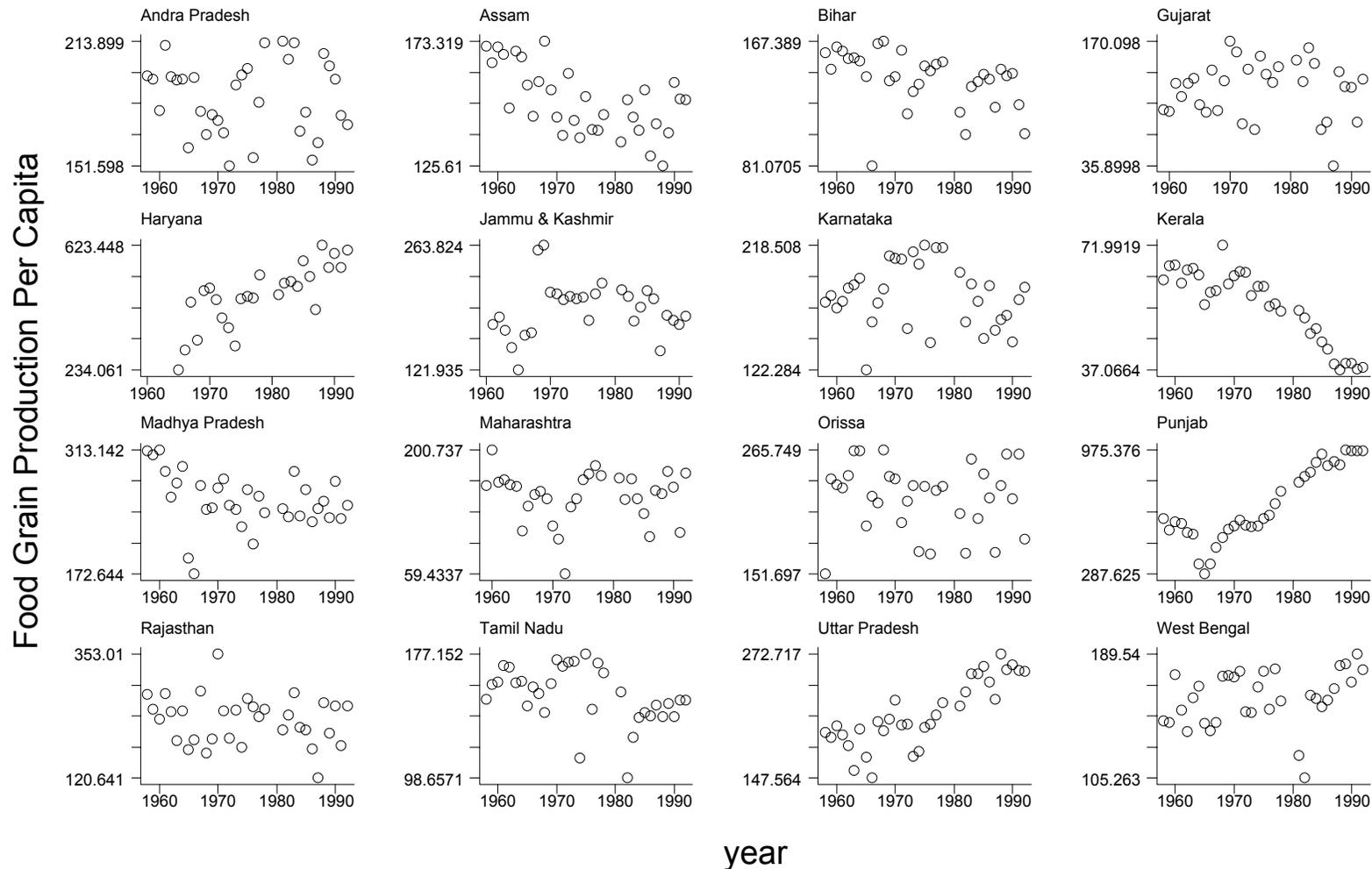


Figure I: Food Grain Production Per Capita: 1958-1992

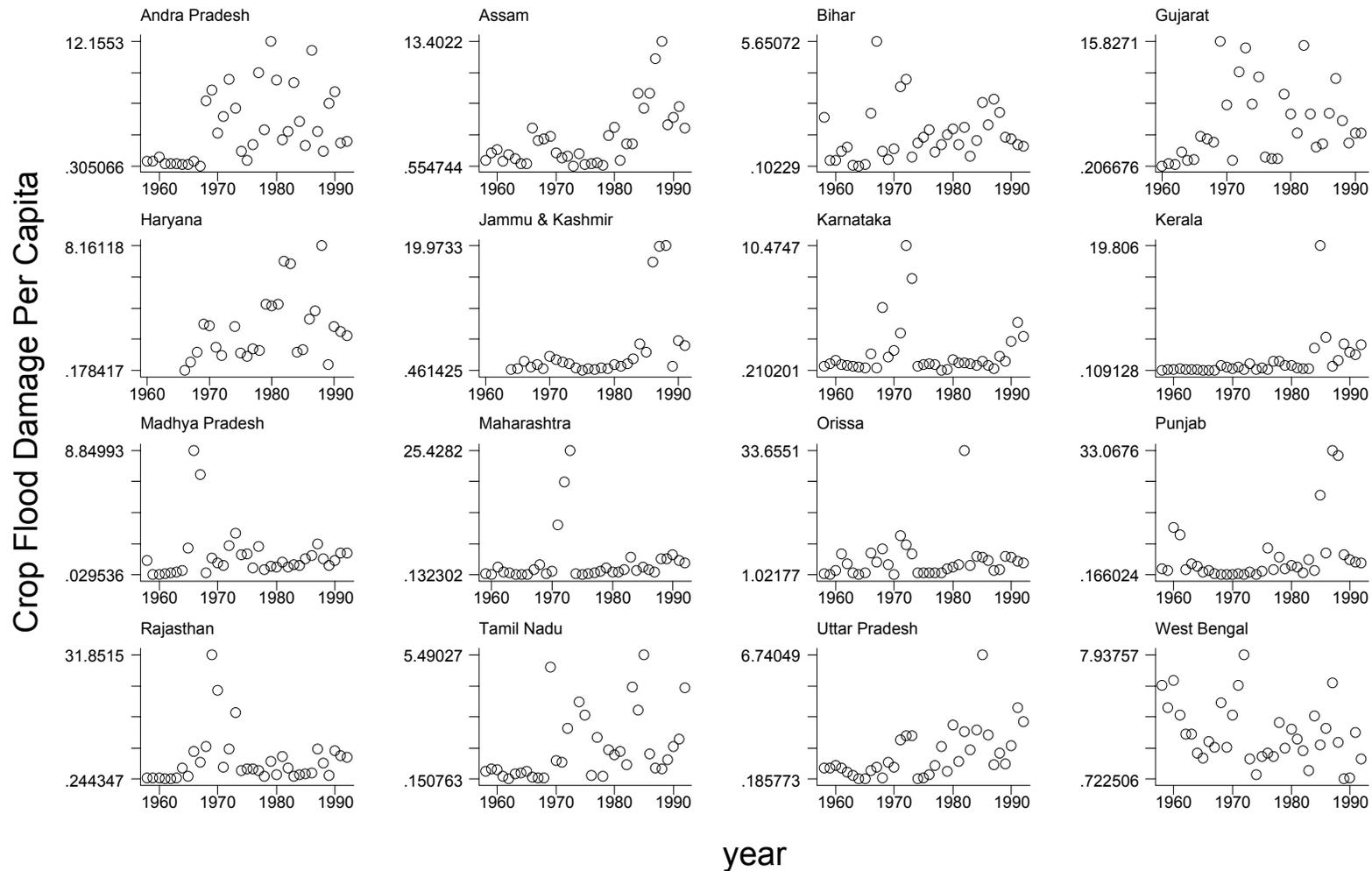


Figure II: Crop Flood Damage Per Capita: 1958-1992

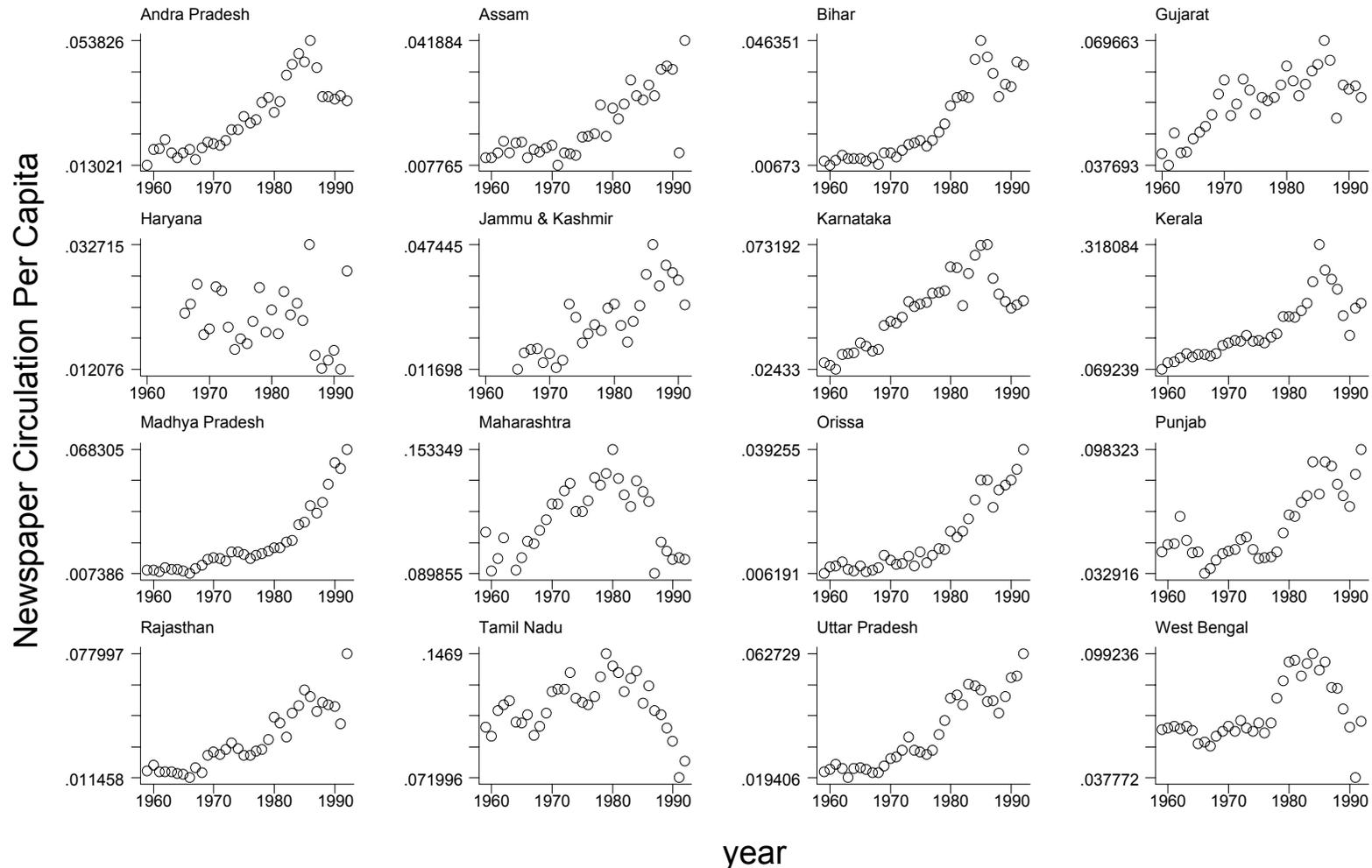


Figure III: Newspaper Circulation Per Capita: 1958-1992

TABLE I  
SUMMARY OF MAIN VARIABLES

State	Public food distribution	Calamity relief expenditure	Food grain production	Flood damage	Newspaper circulation	Other newspaper circulation	English newspaper circulation	Hindi newspaper circulation	Electoral turnout	Political competitiveness	State income
Andhra Pradesh	11.615 (9.012)	3.941 (3.399)	185.851 (18.448)	8.252 (14.937)	0.029 (0.011)	0.0299 (0.012)	0.003 (0.001)	0.001 (0.001)	68.719 (3.515)	-0.558 (0.113)	1004 (260)
Assam	24.681 (7.632)	3.419 (3.124)	150.402 (12.973)	10.802 (11.729)	0.0186 (0.009)	0.0135 (0.007)	0.003 (0.002)	0.001 (0.001)	62.978 (11.530)	-0.552 (0.241)	903 (196)
Bihar	11.110 (6.001)	1.491 (1.216)	141.008 (19.695)	6.724 (9.177)	0.020 (0.012)	0.003 (0.002)	0.002 (0.001)	0.014 (0.011)	51.764 (5.903)	-0.454 (0.136)	633 (110)
Gujarat	18.576 (10.512)	5.414 (4.677)	118.376 (30.598)	3.599 (6.285)	0.054 (0.008)	0.053 (0.009)	0.002 (0.001)	0.0005 (0.0004)	55.906 (5.678)	-0.568 (0.253)	1176 (272)
Haryana	9.813 (4.081)	2.840 (2.102)	467.687 (99.335)	8.799 (15.280)	0.020 (0.005)	0.004 (0.002)	0.004 (0.004)	0.013 (0.005)	67.431 (5.108)	-0.541 (0.237)	1444 (357)
Jammu & Kashmir	42.690 (11.219)	3.585 (5.629)	191.525 (30.503)	3.871 (12.672)	0.026 (0.010)	0.022 (0.006)	0.004 (0.003)	0.001 (0.001)	68.964 (5.533)	-0.547 (0.280)	1021 (228)
Karnataka	15.368 (7.774)	1.663 (2.212)	180.081 (24.588)	0.485 (1.844)	0.047 (0.014)	0.045 (0.012)	0.008 (0.002)	0.001 (0.001)	63.372 (5.825)	-0.587 (0.216)	1037 (216)
Kerala	45.979 (19.337)	1.662 (3.441)	54.886 (10.324)	3.607 (7.715)	0.151 (0.060)	0.162 (0.064)	0.004 (0.003)	0.001 (0.001)	77.572 (3.772)	-0.152 (0.123)	864 (182)
Madhya Pradesh	7.564 (5.333)	1.383 (1.802)	255.743 (31.733)	0.552 (2.300)	0.0225 (0.017)	0.0004 (0.002)	0.001 (0.002)	0.020 (0.017)	49.089 (6.056)	-0.531 (0.145)	843 (190)
Maharashtra	28.271 (8.617)	2.752 (5.352)	147.700 (29.260)	0.339 (0.695)	0.117 (0.017)	0.055 (0.007)	0.0480 (0.015)	0.016 (0.008)	59.347 (4.384)	-0.674 (0.183)	1288 (331)
Orissa	10.944 (5.082)	4.673 (5.625)	222.052 (31.243)	5.604 (8.093)	0.016 (0.010)	0.018 (0.011)	0.001 (0.0005)	0.0004 (0.0005)	44.939 (7.490)	-0.413 (0.255)	873 (186)
Punjab	15.952 (12.328)	4.978 (8.058)	668.551 (206.580)	9.946 (19.041)	0.058 (0.019)	0.045 (0.014)	0.004 (0.003)	0.012 (0.007)	66.139 (4.077)	-0.384 (0.223)	1732 (384)
Rajasthan	10.209 (8.765)	5.000 (6.651)	229.405 (45.251)	2.188 (4.649)	0.032 (0.016)	0.003 (0.001)	0.001 (0.003)	0.027 (0.018)	52.991 (6.219)	-0.454 (0.197)	785 (136)
Tamil Nadu	21.243 (11.344)	1.480 (1.470)	150.917 (17.887)	1.007 (2.407)	0.116 (0.016)	0.095 (0.015)	0.018 (0.005)	0.004 (0.004)	69.700 (4.160)	-0.554 (0.141)	1015 (272)
Uttar Pradesh	8.106 (3.368)	1.505 (1.360)	213.085 (33.443)	9.727 (10.255)	0.035 (0.013)	0.005 (0.001)	0.003 (0.001)	0.028 (0.012)	52.075 (6.033)	-0.477 (0.165)	874 (140)
West Bengal	34.504 (10.718)	3.344 (1.754)	159.934 (18.859)	7.972 (11.168)	0.070 (0.015)	0.042 (0.012)	0.019 (0.004)	0.008 (0.003)	66.506 (8.728)	-0.452 (0.127)	1173 (191)
<b>TOTAL</b>	19.774 (15.191)	3.058 (4.340)	218.182 (154.980)	5.245 (10.526)	0.053 (0.045)	0.034 (0.041)	0.008 (0.013)	0.011 (0.013)	60.955 (10.793)	-0.492 (0.224)	1030 (346)
Number of observations	544	539	515	527	528	524	525	524	550	552	510

Standard deviations are in parentheses. See the Data Appendix for detail on construction and sources of variables. The data are for the sixteen main states and for the period 1958 - 1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. We therefore have a total of 552 possible observations. The final row gives the total no of observations available for each variable over this period.

TABLE II  
SHOCKS AND RESPONSES IN INDIA: 1958 - 1992

	food grain production	public food distribution	public food distribution	flood damage	calamity relief expendi- ture	calamity relief expendi- ture
	(1)	(2)	(3)	(4)	(5)	(6)
Drought	-24.72 (2.33)			-3.510 (3.43)		
Flood	4.475 (0.65)			6.207 (3.20)		
Food grain production		-0.027 (3.55)			0.009 (1.60)	
Flood damage			0.035 (0.79)			0.141 (4.82)
State effects	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Number of observations	460	512	524	480	507	523
Adjusted R <sup>2</sup>	0.84	0.71	0.69	0.18	0.19	0.27

Absolute t statistics calculated using robust standard errors are reported in parentheses. See the Data Appendix for details on the construction and sources of the variables. The data are for the sixteen main states and for the period 1958 - 1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. We therefore have a total of 552 possible observations. Deviations from this are accounted for by missing data. Public food distribution and food grain production are expressed in per capita terms. Calamity relief expenditure and flood damage are in real per capita terms. The variables drought and flood are dummy variables for when annual average rainfall is two standard deviations below or above the state specific rainfall mean 1958-1992.

TABLE III  
DETERMINANTS OF GOVERNMENT ACTIVISM

	Public food distribution			Calamity relief expenditure		
	(1)	(2)	(3)	(4)	(5)	(6)
Food grain production	-0.024 (2.51)	-0.026 (2.67)	-0.024 (2.43)			
Flood damage				0.149 (4.67)	0.146 (4.72)	0.144 (4.57)
Newspaper circulation		97.19 (3.37)	97.82 (3.60)		39.84 (2.34)	38.63 (2.25)
Turnout			-0.115 (1.612)			0.015 (0.52)
Political competition			5.671 (3.11)			0.753 (0.70)
Election dummy			2.497 (2.35)			-0.032 (0.07)
Log state income	3.617 (0.69)	5.678 (1.07)	2.705 (0.51)	-2.258 (0.72)	-1.724 (0.54)	-2.417 (0.78)
Ratio of urban to total population	130.47 (2.37)	71.82 (1.37)	62.14 (1.20)	-20.02 (0.97)	-45.54 (1.89)	-42.70 (1.77)
Population density	-18.42 (0.82)	-34.03 (1.76)	-36.04 (1.95)	-9.588 (1.56)	-17.85 (2.61)	-17.29 (2.59)
Log population	-43.96 (2.94)	-46.23 (2.96)	-49.59 (3.18)	-10.86 (1.16)	-9.249 (0.99)	-12.25 (1.30)
Revenue from centre	0.079 (1.88)	0.044 (1.13)	0.053 (1.41)	0.019 (0.43)	0.006 (0.14)	0.009 (0.19)
State effects	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Number of observations	476	474	471	491	489	486
Adjusted R <sup>2</sup>	0.75	0.76	0.77	0.27	0.28	0.28

Absolute t statistics calculated using robust standard errors are reported in parentheses. See the Data Appendix for details on the construction and sources of the variables. The data are for the sixteen main states and for the period 1958 - 1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. We therefore have a total of 552 possible observations. Deviations from this are accounted for by missing data. Public food distribution and food grain production are expressed in per capita terms. Calamity relief expenditure, flood damage, log state income and revenue from centre are in real per capita terms. Turnout is lagged one period and thus refers to turnout in the previous election. Political competition is defined as minus the absolute difference in the share of seats occupied by the dominant political party (Congress) and its main competitor. Election dummy captures whether it is an election or pre-election year. Revenue from the centre is the share of central tax revenue received by states via a sharing formula.

TABLE IV  
NEWSPAPERS AND RESPONSIVENESS

	Public food distribution				Calamity relief expenditure		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Food grain production	0.019 (0.98)	-0.000 (0.00)	-0.021 (2.15)	0.011 (0.56)			
Flood damage					0.063 (2.58)	0.144 (4.46)	0.085 (2.95)
Newspaper circulation	146.84 (4.52)	152.34 (3.96)			19.41 (1.31)		
Newspaper circulation* food grain production	-0.444 (3.11)	-0.412 (2.53)					
Newspaper circulation* flood damage					1.677 (2.83)		
English newspaper circulation			54.64 (0.61)	91.63 (0.68)		42.97 (0.86)	47.76 (0.96)
Hindi newspaper circulation			-14.34 (0.29)	-157.43 (1.18)		3.515 (0.10)	-19.33 (0.52)
Other newspaper circulation			118.88 (3.45)	168.02 (3.88)		42.14 (2.30)	20.35 (1.35)
English newspaper circulation*food grain production				-0.229 (0.36)			
Hindi newspapers circulation*food grain production				0.542 (1.09)			
Other newspaper circulation*food grain production				-0.605 (2.84)			
English newspaper circulation*flood damage							-5.683 (1.70)
Hindi newspaper circulation*flood damage							2.410 (1.29)
Other newspaper circulation*flood damage							1.964 (3.16)
Economic controls	YES	YES	YES	YES	YES	YES	YES
Political controls	YES	YES	YES	YES	YES	YES	YES
State effects	YES	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES	YES
Number of observations	471	419	467	467	486	482	482
Adjusted R <sup>2</sup>	0.77	0.76	0.77	0.77	0.30	0.28	0.30

Absolute t statistics calculated using robust standard errors are reported in parentheses. See the Data Appendix for details on the construction and sources of the variables. The data are for the sixteen main states and for the period 1958 - 1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. We therefore have a total of 552 possible observations. Deviations from this are accounted for by missing data. Public food distribution, food grain production and newspaper circulation are expressed in per capita terms. Calamity relief expenditure and flood damage are in real per capita terms. "Other" captures circulation of newspapers published in languages other than English or Hindi. Food grain production in column (2) is that predicted from drought and flood variables (dummy variables for when annual average rainfall is two standard deviations below or above or below the state specific rainfall mean) and state and year dummies (see column (1) of Table II in the paper). This predicted value captures the "shock" element of food production which is driven by climatic factors. Actual food grain production is used in the remainder of the regressions. The political controls are turnout lagged one period, minus the absolute difference in the share of seats occupied by the dominant political party and its main competitor and a dummy for whether it is an election or pre-election year. The economic controls are log real state income per capita, ratio of urban to total population, population density, log of total population and revenue received from the centre expressed in real per capita terms.

TABLE V  
NEWSPAPERS AND RESPONSIVENESS: INSTRUMENTING WITH OWNERSHIP DATA

	Public food distribution	Public food distribution	Newspaper circulation	Calamity relief exp	Calamity relief exp	Newspaper circulation
	(1)	(2)	(3)	(4)	(5)	(6)
Food grain production	-0.023 (2.10)	0.055 (2.45)	0.000 (0.70)			
Flood damage				0.144 (4.40)	0.051 (1.23)	0.000 (0.62)
Newspaper circulation	321.26 (2.36)	408.04 (3.14)		109.21 (2.66)	75.03 (1.87)	
Newspaper circulation* food grain production		-0.683 (4.73)				
Newspaper circulation* flood damage					1.758 (1.89)	
Share of newspapers owned by individuals			0.023 (1.21)			0.011 (0.65)
Share of newspapers owned by public joint stock companies			-0.139 (1.09)			-0.127 (1.05)
Share of newspapers owned by private joint stock companies			-0.028 (0.37)			0.002 (0.03)
Share of newspapers owned by societies or associations			0.081 (2.39)			0.070 (2.32)
Share of newspapers owned by political parties			-0.927 (5.19)			-0.912 (5.39)
Economic controls	YES	YES	YES	YES	YES	YES
Political controls	YES	YES	YES	YES	YES	YES
State effects	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Overidentification test p- value	0.97	0.91		0.97	0.98	
F-test instruments (Prob>F)			5.70			5.93
Number of observations	438	438	439	443	443	445
Adjusted R <sup>2</sup>	0.76	0.77	0.90	0.27	0.29	0.91

Absolute t statistics calculated using robust standard errors are reported in parentheses. See the Data Appendix for details on the construction and sources of the variables. The data are for the sixteen main states and for the period 1958 - 1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. We therefore have a total of 552 possible observations. Deviations from this are accounted for by missing data. Public food distribution, food grain production and newspaper circulation are expressed in per capita terms. Calamity relief expenditure and flood damage are in real per capita terms. "Other" captures circulation of newspapers published in languages other than English or Hindi. Ownership share refer to the numbers of titles under different forms of ownership expressed as share of total titles. Columns (3) and (6) present the regressions used for instrumenting newspaper circulation in columns (1), (2); and (4), (5) respectively. The overidentification test we employ is due to Sargan [1958]. The number of observations times the R<sup>2</sup> from the regression of the stage two residuals on the instruments is distributed  $\chi^2(T+1)$  where T is the number of instruments. The political controls are turnout lagged one period, minus the absolute difference in the share of seats occupied by the dominant political party and its main competitor and a dummy for whether it is an election or pre-election year. The economic controls are log real state income per capita, ratio of urban to total population, population density, log of total population and revenue received from the centre expressed in real per capita terms.

TABLE VI  
POLITICS AND RESPONSIVENESS

	Public food distribution			Calamity relief expenditure		
	(1)	(2)	(3)	(4)	(5)	(6)
Food grain production	0.041 (0.90)	-0.032 (3.13)	-0.026 (3.01)			
Flood damage				-0.175 (1.63)	0.222 (3.39)	0.161 (3.50)
Newspaper circulation	98.73 (3.62)	93.55 (3.46)	99.49 (3.63)	34.97 (2.14)	36.07 (2.22)	37.95 (2.23)
Turnout	0.085 (0.54)	-0.107 (1.51)	-0.120 (1.67)	-0.018 (0.66)	0.012 (0.42)	0.015 (0.53)
Turnout* food grain production	-0.001 (1.56)					
Turnout* flood damage				0.005 (2.86)		
Political competition	5.899 (3.20)	12.00 (3.08)	5.883 (3.21)	0.753 (0.717)	-0.404 (0.32)	0.657 (0.60)
Political competition* food grain production		-0.027 (2.04)				
Political competition* flood damage					0.182 (1.69)	
Election dummy	2.535 (2.36)	2.420 (2.30)	0.061 (0.03)	-0.125 (0.29)	-0.003 (0.01)	0.197 (0.39)
Election dummy* food grain production			0.012 (1.25)			
Election dummy* flood damage						-0.037 (0.71)
Economic controls	YES	YES	YES	YES	YES	YES
State effects	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES
Number of observations	471	471	471	486	486	486
Adjusted R <sup>2</sup>	0.77	0.77	0.77	0.29	0.29	0.28

Absolute t statistics calculated using robust standard errors are reported in parentheses. See the Data Appendix for details on the construction and sources of the variables. The data are for the sixteen main states and for the period 1958 - 1992. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana. We therefore have a total of 552 possible observations. Deviations from this are accounted for by missing data. Public food distribution and food grain production are expressed in per capita terms. Calamity relief expenditure and flood damage are in real per capita terms. Turnout is lagged one period and thus refers to turnout in the previous election. Political competition is defined as minus the absolute value of the absolute difference in the share of seats occupied by the dominant political party and its main competitor. Election dummy is a dummy for whether it is an election or pre-election year. The economic controls are log real state income per capita, ratio of urban to total population, population density, log of total population and revenue received from the centre expressed in real per capita terms.

APPENDIX 2:  
POLITICAL COMPETITION IN INDIAN STATES 1958-1992

State	Nature and timing of political competition
Andhra Pradesh	1958-1983: Congress versus Janata Parties 1984-1992: Congress versus Regional Parties
Assam	1958-1984: Congress versus Janata Parties 1985-1992: Congress versus Regional Parties
Bihar	1958-1992: Congress versus Janata Parties
Gujarat	1958-1992: Congress versus Janata Parties
Haryana	1958-1992: Congress versus Janata Parties
Jammu & Kashmir	1958-1992: Congress versus Regional Parties
Karnataka	1958-1992: Congress versus Janata Parties
Kerala	1958-1992: Congress versus Hard Left Parties
Madhya Pradesh	1958-1992: Congress versus Hindu Parties
Maharashtra	1958-1992: Congress versus Janata Parties
Orissa	1958-1976: Congress versus Regional Parties 1977-1992: Congress versus Janata Parties
Punjab	1958-1992: Congress versus Regional Parties
Rajasthan	1958-1979: Congress versus Janata Parties 1980-1992: Congress versus Hindu Parties
Tamil Nadu	1958-1992: Congress versus Regional Parties
Uttar Pradesh	1958-1990: Congress versus Janata Parties 1991-1992: Congress versus Hindu Parties
West Bengal	1958-1992: Congress versus Hard Left Parties

Congress Parties includes Indian National Congress, Indian National Congree Urs and Indian National Congress Socialist Parties. Janata parties includes Janata, Janata Dal and Lok Dal Parties. Hard Left Parties includes Communist Party of India and Communist Party of India Marxist Parties. Hindu Parties includes the Bharatiya Janata Party. Regional Parties include Telugu Desam, Asom Gana Parishad, Jammu & Kashmir National Congress, Shiv Sena, Uktal Congress, Shiromani Alkali Dal and "other" Regional Parties, only one of which is active in a particular state. Haryana split from the state of Punjab in 1965. From this date on, we include separate observations for Punjab and Haryana.