

Interest Groups, Information Manipulation in the Media, and Public Policy: The Case of the Landless Peasants Movement in Brazil

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Abstract

We extend the literature on interest group behavior and economic policy outcomes by examining how groups with limited resources (votes and campaign contributions) effectively influence political action through the control of information provided to voters through the media. Voters in turn lobby politicians to take actions desired by the group. In this manner interest groups can secure favorable government actions to a degree far beyond what their size and wealth might otherwise suggest. This is a valuable contribution because of the increased role of the media in the information age and because this linkage better explains observed government policies. We develop a multi-principal, multi-task model of interest group behavior and generate the characteristics of interest groups who would be most successful using the media to secure their policy objectives. We apply the model to the Landless Peasants' Movement (MST) in Brazil. We detail how the MST manipulates information released to the media; we show the general voter response; and we examine the reaction of politicians in changing the timing and nature of policy.

I. Introduction.

In this paper we examine how certain interest groups with limited resources (votes and campaign contributions) nevertheless effectively influence political policy through the control of information provided to voters through the media. We model the characteristics of interest groups who can most effectively utilize the media to influence policy. Three important characteristics emerge: 1) the interest group has low costs (generally labor) of influencing policy; 2) the efforts of the interest group are salient for influencing voters; and 3) voters care about the interest group's demands and lobby politicians to take action. In this manner such interest groups can secure favorable government policies to a degree far beyond what their size and wealth might otherwise suggest. This is a valuable contribution because of the increased role of the media in the information age and because this linkage better explains observed government policies.

There is a large literature on the role of interest groups in lobbying politicians for preferential subsidies, tax exemptions, and other transfers, and it generally argues that cohesive, articulate, wealthy, voting groups are most likely to be successful in competitive

lobby efforts (Peltzman, 1976; Ornstein and Elder, 1978; Becker, 1983; Rothenberg, 1992, 1-5; Grossman and Helpman, 1996, 77; 2002, 2-3, 44). There is a related literature that examines the actions of these interest groups as transmitters of information (Austen-Smith, 1999; Grossman and Helpman, 2001, 2002, 2-3; and Van Winden, 1999 and 2003 for surveys). The flow of information is primarily from the interest group to politicians to directly mold their actions and to mobilize voter support through political endorsements.¹

The media as a conduit for information from interest groups to politicians and to general, uninformed voters is discussed by Baron (1994, 2003). In his framework, political candidates chose among both particularistic and collective policies to maximize campaign contributions, generate favorable electoral education via the media, and generate voter support. Baron (2005) continues this approach by examining the actions of competing interests (industry and “activists”) to influence public sentiment on environmental policies through the media. There is little discussion, however, on the characteristics of the interest groups involved and why they might have particular advantages or disadvantages in the use of the media. Relative labor costs appear to be important. Rothenberg (1992, 11-43, 251) examines the role of organized activists (Common Cause), who despite their limited numbers, use relatively lower-cost, “volunteer,” labor along with campaign funds and media clout to promote desired legislation. Brewer and Libecap (2008) similarly model activist environmental groups as having below market wages that provide advantages in settlement/trial negotiations over resource allocation and use with adversaries who do not have such cost benefits.

¹ See McKelvey and Ordeshook (1985), Lupia (1992). According to Reuben (2002), “Most of the information literature has concentrated on the information transmission between the interest group and the policymaker. It has neglected to look into the information flow among and within the interest groups.” Some exceptions are Grossman and Helpman (1999, 2001) and Cameron and Jung (1995).

We contribute to the literature on this issue by more carefully defining the characteristics of interest groups that successfully influence government policy while lacking campaign contributions and voting power. We also show more precisely how the media is used by those groups and present measures of their impact on government officials in affecting the timing and nature of policy. In our case, an otherwise poor, generally non-voting group has both relatively-lower labor costs in lobbying through the media and a broadly-attractive agenda that increases its lobbying productivity. By manipulating the information released to the press, the group can elicit general voter support for its policies, even though the benefits are narrowly directed and the group has far-fewer resources than do opposing interests. Because voters have limited information about government efforts, the group can emphasize policy failures in order to generate political support for more action. Politicians in turn respond with policies visible to voters, although they may or may not be effective.

As an illustration of our model we focus on the Landless Peasants Movement (*Movimento Sem-Terra*) or MST and its efforts to influence domestic land reform policy in Brazil. As we describe the MST represents a comparatively small and poor sector of the Brazilian electorate, yet it has been remarkably effective in promoting its agenda. Although we direct attention to the MST in Brazil, our analysis can be generalized to interest group use of the media in other democracies.² We examine Brazil because it has land distribution problems similar to those facing other Latin American societies and because its interest group politics are comparable to those found elsewhere.

² Tetlock and Oppenheimer (2008) argue that environmentalists were able to create a “taboo” amongst voters concerning any drilling in the Arctic National Wildlife Refuge (ANWR).

We analyze the politics of land reform in Brazil through a model with a unitary government, the President or executive.³ The framework takes into consideration the constraints faced by the President in determining how many resources to devote to interest group demands. Although there are well-organized, wealthy constituents, (large property owners), who oppose land reform, we show how the MST successfully counters through the media by changing voter perceptions about the extent of government land reforms.

In general, urban voters support rural land reform, but because it does not directly affect them, they have little incentive to determine whether or not the government's claims of action are consistent with actual resource allocation. Indeed as we show, despite broad voter backing, prior to the mid 1990s and the rise of MST as an interest group, there was little progress on land reform. Entrenched opposition from property owners and the inability of voters to monitor government policies resulted in claims of action with little practical result. After 1993, however, the pattern changed and we analyze how this occurred through the manipulation of information by the MST.

Our model captures three important aspects of the relationships among interest groups, the electorate, and the government: i) the moral hazard that arises from information asymmetries in the relationship between interest groups and policy makers; ii) the existence of multiple groups simultaneously pressuring the government for competing policies; and iii) the possibility that some groups may change the information available to voters about policy outcomes and thereby indirectly shift the equilibrium level of government effort. From this model we derive the characteristics of an interest group that would lead it to rely on the media to influence voters rather than to directly lobby politicians through

³ We use a unitary government because it is reflective of the Brazilian setting, but it also is similar to Parliamentary democracies.

contributions and votes. In Section IV we argue that the MST matches those characteristics and provide evidence that its actions have increased electoral pressure on the government for land reform.

II. A Multi-principal, Multi-task Model of Interest Group Behavior.⁴

In this section we present the multi-principal, multi-task model of interest group pressure specifically applied to the case of land reform in Brazil. In the appendix the more general model for $n+1$ groups (n interest groups plus voters) is presented and can be referred to for details not shown in the more streamlined presentation in the text. The agent in the model for simplicity and better link to the empirical case is a unitary government (executive) who is in charge of creating and pursuing all policies including land reform. There are three principals whom we denote with superscripts m , l , and v , for MST, landowners and voters, respectively.

Each principal is interested in a specific policy (task) and would like to see the government satisfy their preferences. The tasks sought by each principal are denoted with the following subscripts: s for a policy of expropriation of private land and creation of settlement projects defended by the MST; p for the (non-) reform policies sought by landowners; and q for the reform policies sought by voters.⁵ Given the limits on the agent's time and resources, effort expended on one task reduces the level of effort that can be allocated to another. The vector of government effort toward land reform is $t' = \begin{vmatrix} t_p & t_q & t_s \end{vmatrix}$, where the prime denotes a transpose.

⁴ This model is based on that by Dixit (1996, pg.157-171), which is a combination of the multi-task model of Holmström and Milgrom (1991) and the multi-principal model of Bernheim and Whinston (1986).

⁵ Note that the land reform policies desired by the voters can be the same as those pursued by the MST. In the next sections we will provide more information on the nature of each groups' preferences.

In general the principals do not observe the level of effort placed by the government in each task, instead they only observe the outcome of that effort. The vector of outcomes is modeled as $\mathbf{x} = \mathbf{t} + \boldsymbol{\varepsilon}$, or:

$$\begin{pmatrix} x_p \\ x_q \\ x_s \end{pmatrix} = \begin{pmatrix} t_p \\ t_q \\ t_s \end{pmatrix} + \begin{pmatrix} \varepsilon_p \\ \varepsilon_q \\ \varepsilon_s \end{pmatrix} \quad (1)$$

where $\varepsilon \sim N(0, \boldsymbol{\Omega})$ and $\boldsymbol{\Omega}$ is the covariance matrix of the random noise variable ε . $\boldsymbol{\Omega}$ is a 3x3 matrix with principal diagonal ω_i , $i=1, 2, 3$, and zeros elsewhere. The larger the value of ω_i the more difficult it is for the principals to infer the level of effort t_i from the observation of the outcome x_i .

Principal i benefits from policy outcomes according to the benefit functions b_i that can be written as:

$$\text{benefit to principal } i = \begin{pmatrix} b_p^i & b_q^i & b_s^i \end{pmatrix} \begin{pmatrix} x_p \\ x_q \\ x_s \end{pmatrix} = \mathbf{b}^i \cdot \mathbf{x} \quad (2)$$

Following Dixit (1996) the cost to the government of directing effort to all the tasks is modeled as the following quadratic function:

$$\frac{1}{2} \mathbf{t}' \mathbf{C} \mathbf{t} \text{ where } \mathbf{C} = \begin{pmatrix} c_{pp} & c_{pq} & c_{ps} \\ c_{qp} & c_{qq} & c_{qs} \\ c_{sp} & c_{sq} & c_{ss} \end{pmatrix} \quad (3)$$

where the matrix \mathbf{C} is assumed positive definite. If the off-diagonal terms are positive there will be substitution amongst types of effort, so that an increase in t_i will imply a decrease in t_j , and vice-versa. If these terms are negative the types of effort will be complementary.

In the appendix we present the detailed derivation of the general model. Here we discuss only the main steps of the model so as to focus on the results. The derivation is

done in four steps, starting with a first-best benchmark and adding additional elements in each step; (i) asymmetric information, (ii) multi-principals and (iii) information manipulation. We will present and discuss the optimality conditions for each of these steps.

The benchmark case is one where the principals observe the levels of effort chosen by politicians and additionally are able to act cooperatively. As shown in the appendix, the optimal level of effort in this scenario is obtained by maximizing the sum of the agent's and the principals' net benefit from their interaction in the policymaking process. This yields the first-order condition $\mathbf{b} - \mathbf{C}\mathbf{t} = 0$, so that the first best level of effort is:

$$\mathbf{t} = \mathbf{C}^{-1}\mathbf{b} \quad (4)$$

where \mathbf{C}^{-1} is the inverse of the \mathbf{C} matrix. This result simply states that the marginal cost of effort in each task equals the marginal benefit to all parties.

The second step is to relax the assumption of observable effort. In this situation contracts between the principals and politicians must be made contingent on \mathbf{x} (outcomes) and no longer on \mathbf{t} (effort). As shown in the appendix, a linear reward scheme is used to stipulate the government's pay-offs given outcomes \mathbf{x} . That is, given the observed outcomes \mathbf{x} , the united principals provide politicians political support in terms of votes and contributions that has a monetary equivalent equal to $\boldsymbol{\alpha}'\mathbf{x} + \beta$, where the $\boldsymbol{\alpha}$ s are the value of the marginal support given by the principals to government effort and β is a fixed payment that can be adjusted to assure the agent's reservation utility is at least matched. In this scenario the first-order conditions are:

$$\mathbf{t} = \mathbf{C}^{-1}\boldsymbol{\alpha} \quad (5)$$

Comparison of (4) and (5) shows that the addition of asymmetric information leads to a substitution of α for b in those equations. In the appendix it is shown that the relationship between α and b is:

$$b = (I + rC\Omega)\alpha \quad (6)$$

where I is an identity matrix and r is the coefficient of risk aversion of the government. Given that (i) all elements of C are positive (assuming outweighing substitutability amongst tasks); (ii) the elements of Ω are positive, because they are variances; (iii) the α s are positive, because the united principals will not want negative effort, it must be that $b_j > \alpha_j$ where $j=p, q, s$.

Accordingly, the government optimally chooses less effort when effort is not observable than in the first-best situation where it is. This is the standard second-best story where, as a result of moral hazard arising from information asymmetries, less effort is directed to each task. In other words, the incentives in the case of asymmetric information are more low-powered than in the full-information case, due to the fact that in the second-best case there is a sharing of risk between the principals and legislators.

The third step is to allow non-cooperative behavior among the principals. This involves finding the Nash equilibrium of the game where each principal provides his own incentives to the agent and strategically takes into account the actions of the other principals. Now each principal i 's incentive scheme for task j is $\alpha_j^i x_j + \beta_j^i$ for $j=p, q, s$ and $i=l, v, m$, while the total for each principal is $\alpha^i x + \beta^i$. In the appendix we show that the expression for the total benefit arising from the Nash equilibrium, adding the benefit of all individual principals, is:

$$b = \alpha + 3r\Omega C\alpha \quad (7)$$

This equation can be compared to equation (6), the total benefit that resulted when principals were able to act cooperatively.⁶ Remembering that when $\alpha=b$ and the first-best solution is achieved, we can see that with non-cooperative principals a situation is reached that is even further from first-best than with unified principals, since r is now multiplied by the number of principals. The situation is therefore a third-best, characterized by apparent inefficiencies and low-powered incentives. In fact the inefficiencies are simply a direct consequence of the multi-principal multi-task nature of the problem.

To take the final step in modeling land reform politics in Brazil, suppose now that each of the three principals can influence policy not only through direct incentives (contributions, votes) represented by α^i , but also by affecting the level of information available concerning the government's efforts in each task, that is, by affecting ω_{pp} , ω_{qq} and ω_{ss} . The problem faced by each group then becomes that of deciding not only the optimal level of α^i_j to allocate for each task j , but also how much effort it will place towards affecting the information available to all parties (and especially voters) regarding each of the tasks. Let this effort by each interest group $i=l, v, m$ to influence the information concerning efforts in each task be $e^i = \begin{bmatrix} e^i_p & e^i_q & e^i_s \end{bmatrix}$.

When deciding on the optimal level of e^i the interest group will take two factors into account. The first is that effort is costly, where the cost of that effort is represented by the cost function $G^i(e^i)$. The second is the fact that all other groups may also expend efforts to affect information availability, so that the solution will be a Nash equilibrium. Let e^{-i} be the vector of effort of all interest groups other than i . It is shown in the appendix that interest

⁶ In the more general case of $n+1$ principals this equation is $b = \alpha + (n+1)r\Omega\alpha$.

group i 's problem is now to maximize the following objective function with respect to α^i and e^i taking α^{-i} and e^{-i} as given:

$$b^i C^{-1} \alpha^i - r \alpha^{-i} \Omega(e^i, e^{-i}) \alpha^i - \frac{1}{2} \alpha^i (C^{-1} + r \Omega(e^i, e^{-i})) \alpha^i - G^i(e^i) \quad (8)$$

The change compared to the previous objective function is the cost function at the end and the fact that the matrix of variances is now a function of the level of effort by each principal to influence information. The first order conditions for the maximization of (8) in extended form are:

$$b_s^i = \alpha_s^i + r c_{ss} \omega_{ss} \alpha_s + r c_{sp} \omega_{pp} \alpha_p + r c_{sq} \omega_{qq} \alpha_q \quad (9)$$

$$b_p^i = \alpha_p^i + r c_{ps} \omega_{ss} \alpha_s + r c_{pp} \omega_{pp} \alpha_p + r c_{pq} \omega_{qq} \alpha_q \quad (10)$$

$$b_q^i = \alpha_q^i + r c_{qs} \omega_{ss} \alpha_s + r c_{qp} \omega_{pp} \alpha_p + r c_{qq} \omega_{qq} \alpha_q \quad (11)$$

$$- r \omega_{ss}^i \alpha_s^{-i} \alpha_s^i - \frac{1}{2} r \omega_{ss}^i (\alpha_s^i)^2 = G_{e_s}^i \quad (12)$$

$$- r \omega_{pp}^i \alpha_p^{-i} \alpha_p^i - \frac{1}{2} r \omega_{pp}^i (\alpha_p^i)^2 = G_{e_p}^i \quad (13)$$

$$- r \omega_{qq}^i \alpha_q^{-i} \alpha_q^i - \frac{1}{2} r \omega_{qq}^i (\alpha_q^i)^2 = G_{e_q}^i \quad (14)$$

The first order conditions (9), (10) and (11) define α^{i*} , the optimal incentives by principal i for each task. These equations show, as before, that the principal will offer a third-best level of incentive for each task due to the information asymmetries and the existence of other principals who are also providing incentives to the government.

The first order conditions (12), (13) and (14) define e^{i*} , the optimal level of effort that principal i will place towards affecting information availability on each of the $n+1$ tasks. The two terms on the left of each equation in that system show how much the marginal effort increases or reduces the wedge between the first-best situation $b^i = \alpha^i$ and

the third-best situation $b^i = \alpha^i + r C \Omega \alpha$. Those two terms are therefore the marginal benefit from effort e^i , whereas the term G_e^i is the marginal cost.

It is possible to perform comparative statics on this system to see what happens to optimal incentives for political action with a change in the level of information available. The direction of change depends on all parameters of the model. Intuitively, each principal will alter the incentives provided the executive for a given task when more information becomes available regarding the government's effort. Those who benefit from that task will seek to provide additional incentives now that they have a better notion of what they are receiving from politicians in exchange. Those who oppose the task will provide fewer negative incentives because the returns from opposition are reduced. These reactions may be reversed, however, depending of the relative values of the cost and benefit functions, C and b^i . Whatever the case, each interest group can strategically calculate how much and in which direction to affect information so as to pursue its policy preferences.

Implications from the model for interest groups' choice of instrument

In order to illustrate the implications of the model for land reform policy in Brazil, assume that the government's main constraint are voters so that value of α^v , the support (or opposition) given by the voters, is the largest part of the total support received by the government for all the tasks in this policy issue. Take from (9) the expression that defines α_q^v , the optimal level of incentives that the voters will offer politicians for an additional unit of effort on land reform policy:⁷

$$b_q^v = \alpha_q^v + (rC\Omega\alpha)_q \quad (15)$$

⁷ Where $(rC\Omega\alpha)_j$ is the j^{th} element of this 3 x 1 vector. Note that the voters' desired policy q is the same as the MST's desired policy s .

Because the MST is interested in task q , it would gain if the voters increased their incentives to politicians for that task. At a given level of information availability, that is a given Ω , the voters will be offering α_q^v *, which is less than the first best level b_q^v , the difference between them being $(rC\Omega\alpha)_q$.⁸ Because voters support task q , b_q^v (an exogenous parameter) will be positive. Therefore the MST can benefit by allocating effort towards reducing ω_{qq} in Ω , that is the noise in the voter's information about the government's efforts, so as to diminish the term $(rC\Omega\alpha)_q$.⁹ Greater incentives lead to more resources devoted by the government to land reform, thus benefiting the MST. How much effort the MST will choose to apply towards pursuing this benefit is determined by the first order conditions in (12), (13) and (14), which show the marginal gains and marginal costs of an additional unit of effort to influence voter information.

The model in its general form has each principal providing incentives α^i for each $n+1$ tasks and affecting information on each task through e^i . In addition each principal is aware that the others will also act this way and takes that into account when making his decisions. The final effect on government effort, and consequently on outcomes, thus depends on the net result of these simultaneous forces.

In practice we would not expect all interest groups to be able to influence information on each task, but rather that each group would have a comparative advantage in influencing particular policies. That is, in real applications we would expect that the

⁸ Note that if there were no risk aversion, $r=0$, or if there were no information asymmetries, $\Omega=0$, then $rC\Omega\alpha$ would equal a null vector and the first-best level of incentives would be offered.

⁹ More generally, affecting information may entail either increasing ω_j (obfuscation) or reducing it (making truthful information available), depending on the signs of the elements in α and C since r and Ω are always positive. Note that α includes the incentive of each principal for each task, which are endogenously determined, and C includes parameters that are negative if another task is a complement to task j and positive if a substitute. Interest group i will assess all this information and either obfuscate or provide more information so as to lead the voters to provide a higher level of α_j^v *.

optimal incentives provided by each principal on some of the tasks, as well as the optimal effort expended to influence information, would be corner solutions and equal zero. The reason for this is that it is typically not easy for an interest group to be able to affect the level of information, either to make things more transparent or to obfuscate. Doing so often requires special characteristics of the interest group that are costly to acquire, and indeed, may not be readily purchased or emulated. In some cases, for example, it may be credibility that leads voters to believe the interest group's claims about the actions of government.

Accordingly, whether an interest group will be successful in pursuing its policy interests through the manipulation of information depends on the characteristics of the interest group and the policy that it is pursuing. By isolating some of the elements in the first order conditions (10), (11) and (12) we can analyze three such characteristics of an interest group:

i) The higher the marginal cost of influencing information, $G_{e_j}^i$, the lower will be the optimal level of such effort chosen by that group, *ceteris paribus*. If the marginal cost is sufficiently high, then it may be above the marginal benefit for all positive level of effort, so that the group will not try to influence information on that task. The fact that some interest groups pursue their objectives through contributions, rather than through information control may be due to the relative costs of influencing the information flow to urban voters. In particular some interest groups may have relative advantages in lower labor costs and therefore be better able to influence the information flow regarding government policy efforts to voters.

ii) The derivative $\frac{\partial \omega_{ij}(e_j^i, e_j^{-i})}{\partial e_j^i}$ can be interpreted as the productivity of effort by an

interest group to control information provided to voters. The more an additional unit of effort changes ω_{ij} , the more productive the group and the more influence it will have over policy for each dollar spent in effort. Low productivity for some groups may be due to their lack of credibility among voters. Accordingly interest groups that work through the information channel will tend to have reputation advantages and effective means of gaining attention.

iii) The ability of an interest group to affect policy through information depends on the preferences of all $n+1$ principals (\mathbf{b}). If voters care strongly about a given policy, either favorably or in opposition, then changes in the level of information they receive can have important impacts on the government's effort level for that policy.¹⁰ If they are closer to indifference however, then pursuing that task by influencing information will be less fruitful *ceteris paribus*, even for a group well endowed with the other characteristics.

We apply this model and the characteristics of interest groups generated from it to analyze the actions of the MST in promoting land reform in Brazil through use of the media to generate voter support.¹¹

III. Background: Land Reform in Brazil.

Before examining the implications of the model, it is useful to provide some background information on the nature of land reform in Brazil and the role of interest groups in affecting the extent and patterns of reform. Brazil has long had one of the most

¹⁰ We argue later that the public "cares" about the landless. The same holds for the environment, especially if the costs to voters appear to be low.

¹¹ The case examined here would be similar to other examples where voters desire broad public goods (general environmental quality for instance) but have little information as to what government is doing to provide them.

concentrated land ownership structures in the world. Approximately 45 percent of the agricultural land is held by the largest 1 percent of farm owners, and large tracts of this land are not used. The Gini coefficient of 0.85 in 1985 was the 9th highest in the world, only behind countries like Panama, Barbados, and Guam (FAO/UN, 2004).¹² In terms of the size of the population affected it is certainly among the most problematic cases with more than 4 million landless peasants estimated,¹³ a contingent bigger than the entire population of some of those countries (Panama – 3 million, Barbados – 0.265 million, Guam – 0.166 million).

Concentrated land holdings grew out of the Brazilian colonial experience, and since the 19th century there have been repeated efforts by the central government to “substitute small holdings for latifundia” [Dean, 1971:624]. In 1938 the federal government created the Land and Settlement Division that focused mostly on distributing public land. In 1946 the Constitution introduced the notion of expropriation of a private farm if it were not fulfilling its “social function,” allowing latifundia to be expropriated. After the military coup of 1964, the government viewed land reform as key to economic development, and with return of civilian rule further attempts were made, and indeed, every new government had a special land reform program with ambitious goals that featured prominently in party platforms and election campaigns.

But little of consequence happened. The Gini coefficient barely budged. In 1960 it was 0.842; in 1978, and 1998, 0.843. Very large farms of over 1,000 hectares also

¹² The ten highest Gini coefficients in the FAO dataset (www.fao.org/es/ess) are Barbados (0.94, 1989 data), Paraguay (0.93, 1991), Guam (0.88, 1987), Virgin Islands (0.87, 1987), Panama (0.87, 1990), Bahamas (0.87, 1994), Peru (0.86, 1994), Spain (0.86, 1989), Brazil (0.85, 1985), Argentina (0.83, 1988).

¹³ This is the estimate typically given by the Landless Peasants Movement. The Lula government’s II National Plan for Agrarian Reform (Ministério do Desenvolvimento Agrário, 2004) puts the demand for land reform at 3.1 million, or 5 million if one counts those who have land but in an insufficient amount. The Food and Agriculture Organization estimated the demand for land reform in Brazil at 2.5 million families in the mid-nineties (Romeiro et. al. 1994).

continued to dominate land holdings. In 1940 1.5percent of the farms held 48.3percent of farmland; in 1960 1.0percent held 44.1percent; and in 1980 0.9percent held 45.1percent, and in 1996 1.1percent held 45.1percent.¹⁴

Despite this lack of action, the general electorate has long been sympathetic to the notion of land reform, a natural reaction given such salient inequality.¹⁵ This broad constituency for land reform, however, is unorganized, heterogeneous and has only limited information regarding how much land reform is being carried out. Rural property owners have steadfastly opposed it.¹⁶ Historically, they were well organized and provided support to politicians through contributions and votes. They were represented by several organizations, such as the Brazilian Rural Society (*Sociedade Brasileira Rural*) and especially by a large group of Congressmen from various parties, known as the ‘rural bench’ (*bancada rural*), that united to promote the interests of land owners and agricultural producers. As a result until after 1993, the pattern was for politicians to call for aggressive land reform during electoral campaigns, and for little to be implemented once the election was over. So long as large landowners could deliver more support than could landless peasants, and so long as voters had little information on the actual state of land reform, politicians devoted few resources to it.

The pattern began to change when the MST (organized in 1985) took advantage of the new Constitution of 1988 that mandated the federal government expropriate and redistribute unproductive properties. Enabling complementary legislation was passed in

¹⁴ Gini coefficients presented here are from Incra (2001) which tries to deal with several of the methodological difficulties in the calculation of this index.

¹⁵ Evidence to back this statement will be given in Section III.

¹⁶ See Mueller (1998) for an incidence analysis on which groups were affected by land reform and econometric measurement of their effect on land reform policy.

1993.¹⁷ By the mid 1990s, the MST had honed its strategy of invading unproductive properties with elaborate press coverage to demonstrate the plight of the landless poor. This new public relations effort galvanized voters and spurred the government to act on land reform.¹⁸ As the numbers of invasions multi-plicated, urban voters were continually reminded of the task at hand, and land reform moved to the forefront of political debate with real resources devoted to it. The MST has become regarded as one of the most successful grassroots movements in the world and is frequently held as a model of interest group effectiveness even though it lacks direct voting power and funds to contribute to politicians.¹⁹

In our earlier papers (Alston, Libecap and Mueller, 1999a, 1999b, 2000) we described how MST invasions generated negative publicity for politicians, stimulated broad sympathy toward the landless, and led to further invasions. We were interested in explaining the pattern of invasions and modeled government intervention as exogenous. Here, however, we seek to explain the level of government action in land reform by endogenizing government activity through media campaigns directed by the MST.

This effort is through the multi-principal, multi-task principal-agent model developed above where the government faces pressure from several interest groups and the electorate to pursue several different policy objectives. Each interest group exerts pressure by providing the government with votes (political support or opposition), contributions, or by affecting the information asymmetries faced by all interest groups and the voters

¹⁷ Although the Land Statute of 1964 already provided the legal basis for expropriations, the new Constitution broadened the scope for the use of this instrument, made it easier to use and, most importantly, signaled the disposition of government and society that land reform should be pursued with high priority.

¹⁸ For the history of the MST and an analysis of their organization, thinking and impact see Wright and Wolford (2003).

¹⁹ Noam Chomsky was cited by the Economist (2004) as stating that the MST "...is the most exciting popular movement in the world today."

concerning the government's true level of effort on each policy. In our model, the choice of which channels of influence to pursue depends on each interest groups' comparative advantage with each of these instruments. We argue that the MST has characteristics that make it particularly effective at influencing policy by increasing the electorate's awareness of what the government is actually doing to implement land reform.

IV. The Informational Role of the MST via Manipulation of the Media

In order to understand the impact of the landless peasant movement it is useful to explore the implications of the model to land reform politics in Brazil with and without the MST. This allows us to capture the period before and after the group became active throughout the country.

In the pre-MST period the model has as principals: landowners and urban voters. The landless peasants and rural workers could also be considered principals, but because they lacked organization they had little power to affect government policy. The "task" for landowners was to either block expropriation or if some land reform were to occur, to lobby for additional action that benefited them as well, such as government credit and other subsidies. Both of these policies would have reduced the resources available for actual land reform. The second group, urban voters, sympathized with land reform.²⁰ Voters often mistakenly viewed land reform as costless to them and the country.²¹ Although urban voters

²⁰ Several public opinion polls have been conducted over time to gauge society's position towards land reform. Almeida (1998) reviews eight opinion polls from 1962 to 1998, thus covering a large span of land reform history, and shows that there has consistently been broad support towards land reform. These polls were undertaken under very different methodologies and samples, but all overwhelmingly reflect the fact that Brazilian society has consistently viewed land reform favorably. In 1998, for example, a poll conducted by IBOPE revealed that 80percent of those interviewed were "in favor of land reform." Below we provide econometric evidence that voters react to the land reform efforts of the president.

²¹ Expropriation for the purpose of land reform in Brazil is, by constitutional mandate, compensated at 'fair' value, though much of it in Titles of the Agrarian Debt, so that there are high costs for obtaining land as well as the expenditures to settle and maintain the beneficiary families. In 2004 the budget for INCRA, the federal land reform agency, was R\$ 2.5 billion (approximately US\$ 833 million) though in the end 5.98percent of this

supported land reform, it was not a central preoccupation. They naturally were more concerned about issues that affected them more directly such as unemployment, inflation, health and crime. Consequently, they were rationally only imperfectly informed about what the government was accomplishing in land reform. Before the MST became active, voter information on land reform was essentially what the government reported. The equilibrium resulting from this situation was one where the government announced land reform programs without implementing them.

This equilibrium changed once the MST appeared. The MST was a well-organized interest group with a comparative advantage in influencing the information received by voters through sensational, highly-publicized media events: Farm occupations, marches, invasions of governmental offices, roadblocks, and accusations that the government was stalling.²² Through these actions voters revised their views regarding the government's commitment toward land reform and increased their political pressure for more action.

In this new scenario the equilibrium level of government effort for the land reform 'task' is greater than in the pre-MST scenario. The relationship between MST invasions and occupations and concrete government actions toward land reform (families settled on expropriated large farms and government resources devoted to land distribution) is illustrated by the data in Graphs 1 and 2. They show that *circa* 1993 the MST became more active, increasing the number of invasions and occupations of private farms (Graph 1). This

was frozen by the central government to contribute towards primary surplus targets. In 2004 81,254 families are claimed by the government to have been settled.

²² Indeed, the MST arose because of frustration with the lack of progress on land reform.

resulted in greater budgets for land reform (Graph 2) which in turn led to greater numbers of settled families of landless peasants (Graph 1).²³

Graphs 1 and 2, Table 1 here

Granger causality tests show that occupations, settlement and expenditures of land reform are in fact causally related (see Table 1) with Granger causation found between each pair of these variables.²⁴ That occupation leads to settlement indicates that the MST's strategy of occupation is effective. That expenditures lead to more occupations is the point we made in Alston, Libecap and Mueller (1999a and 2000) showing that governmental effort to solve land conflicts through increased settlement can provide incentives for more invasions. That both settlement and occupation cause greater expenditures is consistent with the argument in this paper: activity by the MST draws attention to the government's performance on land reform and leads to a higher equilibrium level of effort/expenditures.

Graph 3 here

To further illustrate this process, consider the situation regarding land reform after the election of President Lula in late 2002 as shown in Graph 3. The President and his party stressed land reform, but to avoid past inaction that followed elections and that seemed to be occurring in 2003, MST's leaders announced that in April 2004 the movement would

²³ Heredia et al. (2002) find that in a large sample 96percent of land reform settlement projects emerge from some form of conflict rather than government initiative. They also show that although there are several other groups, the MST is by far the most active. The drop in occupations and settlements after 1999 can be attributed to several factors. By that time so many families had been settled that the MST's main focus shifted to pressuring the government to make good on its pledges of credit to those families rather than obtaining more land for new families. This is important for the MST as it receives 1-4percent of all the credit provided to settled families. Also, in 1999 the economy passed through a severe crisis involving a large devaluation of the *real*. In the following years the government successfully dealt with this crisis by pursuing strict fiscal restraint (Alston, Melo, Mueller and Pereira, 2006), which severely constrained the governments land reform effort. Finally, in the year before the 2002 presidential election, the MST purposefully reduced the number of invasions so as not to harm the electoral chances of Lula, who they preferred to the more conservative candidate.

²⁴ Because the sample is relatively small, 17 yearly observations, these results must be taken with care. The test were done with three lags and all three variables were found to have a unit root.

initiate a campaign of occupations that would lead to a “Red April.”²⁵ This threat of violence forced the new government to increase its pace of land reform, expropriating 34 farms in April (Ornaghi, 2004). Its most important effect, however, was to make voters aware that land reform was still not moving forward. The ‘Red Aprils’ were so effective that they have become an annual tradition, leading to a surge of MST activity in that month every year (see Graph 3). These events will be a key element in our empirical test below.

The MST has the characteristics outlined in the model that underlie a comparative advantage in information control: i) low marginal cost of affecting information received by other groups through the use of low-cost labor; ii) high productivity of effort in affecting information through creation of media spectacles that suggested injustice; iii) extreme configuration of preferences of other principals, particularly voters; and iv) favorable cost relations (complementarities and substitutabilities) between its favored task and those of the other principals.

i) Low marginal cost of affecting information ($G_{e_j}^i$).

It is straightforward that interest groups that have low marginal costs of affecting information will pursue more of that strategy, *ceteris paribus*. The MST works closely with the media and maintains a constant flow of newsworthy events. The purpose here is to show that the MST is able to pursue these actions at relatively low cost. Before doing so, however, it is important to note that our argument does not require that voters approve of the MST and invasions of private farms. All that matters is: 1) the MST is continually able

²⁵ This is a play of words linking the red of the MST flag, which flies over every camp, and the possibility that invasions would result in spilt blood.

to elicit press coverage; 2) voters approve of land reform; and 3) the MST's actions impart information to voters on the government's efforts towards land reform.²⁶

A key factor is that the actions of the MST are extremely labor intensive, requiring large contingents of people to be mobilized for long periods of time. The invasion and occupation of a farm, and the process of transforming the occupied farm into an official land reform settlement, are procedures that can take several years, during which the potential beneficiaries go through extreme and unrelenting physical and emotional stress.

An invasion typically requires the group (generally 30 to 500 people) to camp out in neutral territory, such as by the side of a highway, for long periods, often months, awaiting the right time to act. The camps are traditionally composed of cheap black plastic and cardboard tents that have become so much associated with the image of landless peasants. The invasion may go through peacefully or may involve violent conflict.²⁷ The occupied farm is similarly made up of makeshift tents and living conditions are only slightly better than in the previous camps. After an invasion there are eviction attempts, either by the landowner with private militia or by police following a court order for "reintegration of possession." If there is an eviction, the group generally will return to a provisional camp to await the right time to reinvade the same property or start over on another one.

This cycle can be repeated several times and many years can go by before progress is made. To maintain order the MST imposes strict discipline in its camps, where, for

²⁶ An opinion poll by Ibope (2006) showed that 56 percent of Brazilians think the MST brings more negative than positive results to land reform and 53 percent think the government should use the police to evict the MST from evaded farms. When asked who was responsible for the conflicts, 27 percent chose the landowners, 27 percent chose the MST and 48 percent chose the federal government. This is also consistent with our argument that voters correctly perceive the government as responsible for policy outcomes related to land reform.

²⁷ From 1985 to 2003 there were 13,524 conflicts for land in Brazil, most of which involved an invasion and the subsequent resistance to eviction (Comissão Pastoral da Terra, 2004). The number of conflicts follows closely the number of occupations in Graph 1.

example, no alcohol is allowed, settlers can only leave with permission and for limited periods of time, and all work is done collectively. In addition there is constant indoctrination of the settlers on the goals of land reform and other political objectives. The movement has more than 1,000 schools in their settlements where they teach their own curriculum despite being financed by the state (Weinberg, 2004).²⁸

This description shows that the means used by the MST to affect the information received by other parties on the government's land reform effort involves mobilizing very large numbers of people and convincing them to undergo extreme hardship for extended times.²⁹ Practically all of the interest group literature since Olson (1965) and Stigler (1971) has recognized the ability to overcome free-rider problems and low costs of organization as key determinants of interest group success. The ability of the MST to maneuver a large contingent of people, no matter how grueling, tedious or dangerous, is key to the MST's success. It is the low labor (opportunity) cost of landless peasants that enables the MST to control its members.³⁰ Most MST members are extremely poor with little to lose and nowhere to return.³¹ The lack of alternatives makes them more receptive to accept the

²⁸ Despite the biased content of the education that is provided in the schools in settlement projects (Karl Marx, Che Guevara and the Chinese revolution are major topics), it is nevertheless education and children that otherwise might not have had the chance, learn to read and write. In 1995 the MST received a prize from UNICEF in recognition of their work in educating children.

²⁹ From 1995 to 2002 423,813 families were settled in 5,100 official land reform projects most of which arose from MST occupations, Heredeia et al. (2002). This number indicates that the MST is quite adept at recruiting members.

³⁰ The use of low-cost, "dedicated" labor in achieving organizational goals is also illustrated in the actions of environmental groups in the US. These groups often receive pro bono legal support and the assistance of low-wage or volunteer efforts by members. Brewer and Libecap (2008) argue that this cost advantage vis a vis their antagonists leads environmental groups to push for trial rather than to settle disputes over natural resources. With their cost advantage, environmental groups perceive the returns from a trial greater than those of settling. In addition a trial may gather more attention from the media.

³¹ In this regard Wright and Wolford (2003: 54) cite a settler's recollection of his days in an MST occupation: "We lost what little we had when we went to the encampment. We could take little even of those few things that we owned into the new encampment, the only thing we took was our (wood-burning) cook stove. What little savings we had were soon gone, because we were earning nothing. We had no house nor land to return to, no household goods, hardly any clothing, very few of our tools – everything was lost. And there was no way to go back and be the same person again to the old neighbors, the friends on the outside." In other

hardships imposed on them by the movement without rebellion or desertion. With such low opportunity costs, the distant promise of a piece of land is sufficiently attractive so as to make participation in an occupation a worthwhile prospect.³²

It is essential to consider not only the MST's cost of influencing information, but also that of their chief competitor, landowners. As noted by Becker (1983) what matters in competition between interest groups is not absolute but rather relative pressure.

Landowners have considerable financial resources that could be used to influence the availability of information if that proved to be a productive means of affecting policy. Land owners are well organized and have overcome the free-rider problem. In the late 1980s the landowners even formed a political party, the UDR (*União Democrática Rural*) to fight land reform. Despite landowners being organized, they face a relative disadvantage in using the media to influence voters. Landowners, unlike the landless have high labor opportunity costs and the public is not particularly sensitive to the interests of landowners, many of whom are perceived as very wealthy. Instead of using resources to affect the information of the public, the landowners more directly attempt to influence members of Congress.

ii) Productivity of effort in affecting information ($\frac{\partial \omega_{ij}(e_j^i, e_j^{-i})}{\partial e_j^i}$)

The second characteristic for an interest group to be successful at influencing information received by other groups is the productivity of those efforts. A high value of

$\frac{\partial \omega_{ij}(e_j^i, e_j^{-i})}{\partial e_j^i}$ means that the information asymmetry between the government's actions and the

passages the authors also document several positive memories that settlers held from the occupation days, in particular the camaraderie and the sense of empowerment from participating in the movement.

³² With the large number of landless peasants that have been settled and given land in the past fifteen years, the stock of actual landless peasants, that is, those that really have aptitude to work the land rather than simply being poor, has fallen and it may become harder for the MST to recruit in the future. Graziano (2004) argues that there are no longer any "true" landless in Brazil and that current MST occupations are filled mostly with poor, unemployed people living in bad conditions in the cities.

other interest groups, especially the perceptions of voters of the efforts of government, can be greatly affected by additional efforts of group i at reducing or increasing that asymmetry. A low value means that those efforts have low payoffs. The derivative measures the productivity of efforts to affect information. This is a valuable trait that is difficult to attain. Even an interest group that commands more resources may find that its investments in advertising have little persuasive impact on urban voters because of a lack of credibility or reputation. This is why interest groups typically link their objectives with the broader public interest.

The MST, by ostensibly helping the landless poor in a country riddled by an extremely skewed land distribution, has been able to garner credibility, despite its illegal nature and disrespect for private property, which otherwise most Brazilians support. As noted by the *Economist* (1997) in 1996 the MST “won the ultimate accolade: sympathetic portrayal in a prime-time soap opera on Globo, Brazil’s leading television station.” By contrast, landowners have found it hard to appeal to public sympathy. All their attempts at publicity have had very little effect in changing their image as wealthy and trigger-happy hoarders of large unproductive tracts of land.³³

Thus far, we have argued that the MST is not only more adept than landowners and other groups at getting their message through, but also that their message is more effective at altering the level of pressure exerted by voters on the government. Aware that their claims regarding the problems with the government’s land reform will sound self-serving, the landowners prefer to center their efforts at pressuring the government through their

³³ Our model appears to have considerable relevance for actions taken by environmental groups versus oil companies in the U.S.

representatives in Congress, which is consistent with the model's predictions for a group with high marginal costs of affecting information and low productivity of effort.

iii) Extreme configuration of preferences of other principals (b)

The third characteristic which the model indicates that an interest group should have for it to be successful in controlling information is an extreme configuration of the preferences of the other actors. If several of the principals, and especially voters, feel strongly about the cause pursued by an interest group, then it has the opportunity to manipulate their demands on government by altering the information received by voters about the government's actions (Ω in the model). If, for example, an interest group pursues a task that voters approve (abhor) then they can elicit more (less) pressure from the voter on the government by reducing (increasing) the noise in the information received by voters on the efforts of the government. If the voters are indifferent to, or only mildly interested in, that policy, then affecting the information they receive will have little effect on the incentives they provide politicians and the interest group would do better by pressuring through another channel.

Urban voters are sympathetic to land reform and this is a critical advantage for MST. To illustrate the importance of land reform and the political pressure placed on the Brazilian President to implement it, we estimate a model of Presidential popularity, adding to the usual specification of economic and political explanatory variables another variable that measures the number of farm occupations by the MST in the corresponding month. If we show that more MST farm occupations reduce the President's popularity, this will be evidence of the MST's effectiveness in manipulating voter perceptions and forcing the government to increase land reform.

There is a large literature testing the determinants of presidential popularity by regressing measures of popularity, usually opinion poll data, against a series of variables that capture the state of the economy and political events (Price and Sanders, 1993; Edwards, 1991; Erikson, 1989; Markus, 1988; Monroe, 1984, Mueller, 1973). There are no such studies for presidential popularity in Brazil. Our dependant variable is the percentage of the electorate that finds the President’s performance ‘very good / good’ in periodic public opinion polls performed by Datafolha Insituto de Pesquisas.³⁴ As explanatory variables we use: monthly data on inflation; interest rates lagged one month; exchange rates lagged one month; GDP growth in the last 12 months; and popularity lagged one month, the latter variable to control for the inertial aspect of popularity and thus avoid problems with autocorrelation.³⁵

In addition to these economic variables we added controls for some political and social events that may have an impact on popularity. The first of these is a dummy indicating months when President Lula was in office (January 2003 onwards) with President Cardoso’s terms in office as the baseline. Another dummy controls for the ‘Mensalão’ scandal (June to December 2005), where President Lula was accused of purchasing votes in Congress with cash. Given the importance of soccer in Brazil and the

³⁴ Our period of analysis is January 1997 to December 2007. The initial date is constrained by the availability of monthly data on land occupations (www.cpt.org.br) There is data on Presidential approval rates for most months in the period. When no poll was performed that month, we repeat the value of the previous month. Using only ‘very good’ as dependant variable yields similar results. Descriptive statistics are shown below:

Variable	Mean	Std. Dev.	Min.	Max.
Popularity	34.46	10.97	13	52
Occupations	33.27	23.47	2	137
Inflation	0.773	0.938	-0.79	5.84
Exchange rate	2.150	0.773	1.04	3.81
Interest rate	1.507	0.456	0.80	3.34
Δ GDP	0.108	0.044	-0.011	0.236

³⁵ We did not include unemployment and the level of the official minimum wage because these were too highly correlated with GDP growth.

perception that the national squad's success can have economic and political consequences (Flater, Pérignon and Vercruyssen, 2008; Ashton, Gerrard and Hudson, 2003), we added dummies for the World Cups of 1998, 2002 and 2006 (months of June, July and August).³⁶

The key to this test is to add to the list of economic, social and political variables described above measures of the MST's efforts at calling attention to land reform. If these measures affect the President's popularity *ceteris paribus*, we will have found evidence for our hypothesis that the MST impacts the government's effort on land reform through the channel of increasing voters' awareness of the issue. We use two measures of the MST's efforts. The first is the number of occupations promoted by the MST and other landless groups lagged for three months. Occupations are the MST's main instrument to pressure for land reform and always yield high visibility in the media. The second variable is a dummy for the 'Red April' months described above (see Graph 3). These are the months when the MST increases its activities, including occupations, marches, festivals, and interviews, all of which create media attention. If this dummy variable detects a fall in Presidential popularity in the subsequent month (May) of each year, additional evidence will have been found for our hypothesis. The results are presented in Table 2.³⁷

Table 2 here

³⁶ In 1998 Brazil finished in second place, in 2002 Brazil was the world champion and in 2006 it did not reach the semi-finals.

³⁷ In order to rule out that our results may be spurious, we checked that all variables were integrated to the first order, I(1), and subsequently tested for cointegration. The relationships among macroeconomic variables such as inflation, exchange rates, and interest rates may raise concerns about multi-collinearity. In this regard we note that: i) an examination of the correlation matrix for the sample period does not indicate that multi-collinearity is severe in the sample used; ii) using subsets of the explanatory variables does not alter the result for the occupations variable which was extremely robust; and iii) multi-collinearity affects (increases) only the standard errors of the estimated coefficients and not their consistency, so that even in the presence of the problem the result for the occupation variable will still be valid.

The estimated coefficients for all variables except inflation and GDP growth can be interpreted as constant elasticities as the data are in logarithms.³⁸ Lagged popularity is positive and statistically reliable at 1 percent, showing a strong inertia in presidential popularity with an elasticity of 0.82. Despite this inertia, which is in large measure responsible for the high adjusted R-squared of 0.93, all of the economic variables except interest rates have statistically significant estimated coefficients with the expected signs. We find the exchange rate to be negatively associated with popularity. The sample includes periods of an overvalued exchange rate, prior to January 1999, as well as the devaluation shock that occurred that month. The estimated coefficient for inflation is negative and GDP growth has a positive impact on popularity, as one would expect.

The political variables also confirm our expectations. President Lula's popularity is 5 percent higher than that of President Cardoso, when all other variables are set at their means and dummies are set at zero. Setting the corruption scandal dummy to 1 knocks off 3 percentage points from President Lula's popularity. All three World Cups have a positive effect on the President's popularity, but this impact is only statistically significant in 1998 when Brazil was the runner-up. The boost to President Cardoso's popularity from that event is 4 percent, with all other variables set at their means.

³⁸ The null of non-cointegration is rejected in a Phillips-Perron test for unit-root on the residual of the regression in Table 2. A residual based ADF test using the appropriate critical values from MacKinnon (1996) also rejects non-cointegration. Additional evidence of cointegration is given by the Durbin-Watson statistic on the deviations from the regression in Table 2, which was CRDW (13, 129) = 2.02. Finally a Johansen cointegration test which treats all continuous variables as endogenous and excludes the dummy variables rejects the null of no cointegrating equations with a trace statistic = 147.68 (1percent critical value = 111.01) and Max-Eigen statistic = 52.93 (1percent critical value = 46.82). When the same equation is estimated in first differences, so that all variables are stationary, there is still a negative and significant impact of occupations on popularity (p-value = 0.068).

The key variables in this test are the number of farm occupations and the ‘Red April’ dummy. Both capture action by the MST to promote land reform. Our hypothesis is that these actions work by calling the attention of the electorate to land reform and passing the message that the government is not doing enough to address the issue. A finding that these variables have a negative and significant impact on presidential popularity would support that hypothesis as popularity is a measure of voter’s pressure on the government.

Our results show that occupations have a significantly negative impact on popularity. This result is robust to numerous specifications. With all the other variables set at their means and all dummies at zero except the Lula dummy, a one standard deviation increase of the number of farms occupied decreases presidential popularity by 1.57 percentage points from 35.40 to 33.83 percent. This result is corroborated by the ‘Red April’ dummy, which shows that in the months of May that follow a ‘Red April’ the President’s popularity falls, *ceteris paribus*, 2.29 percentage points. Once again this is a strong effect for a non-economic variable that doesn’t directly affect the well-being of most (urban) voters.

These results are consistent with our statements that Brazilians are strongly favorable towards land reform. Furthermore, they show that there is scope for the MST, through its occupations and other actions, to increase the pressure that urban voters place on the government for land reform. The more active the MST, the more resources the President dedicates to land reform, not because he wants to placate the MST itself, but rather because voters would punish the President (loss of popularity) when they perceive that land reform is not progressing as expected.³⁹

³⁹ Another characteristic of interest groups that work through information that emerges from the model is whether their task is a complement or a substitute to the tasks of other principals, that is, the structure of the *C*

Additional evidence on the effectiveness of the MST, comes from a high profile event orchestrated by the MST. In May 2005 the MST organized a march of 12,000 landless peasants that ended in Brasilia where President Lula met them and admitted that he had not met the number of settled families he announced as targets in the beginning of his term. As a result of the march Lula promised: 1) to send a presidential decree to Congress by the end of the month to provide an additional R\$ 700 million for settlement projects; 2) to hire 1,300 new staff members for INCRA, the land reform institute; and 3) to tighten the criteria which determines how productive farms have to be so that they are immune from expropriation (Estado de São Paulo, May 17, 2005; *The Economist*, May 19, 2005). The way which this event unfolded, with the MST calling attention to society about the President's land reform record, and getting promises of more effort in return, conforms very closely to the arguments of this paper.

V. Concluding Remarks

In this paper we contribute to the literature on interest group activity, government policy, and use of the media. We develop more clearly than has been done previously the characteristics of groups that are likely to be successful in mobilizing general voter support

matrix. A group whose task is a substitute (complement) to other groups' tasks will observe negative (positive) incentives (that is, the α^{-1} 's) from those groups to the government for their task of interest. In the model the C matrix is common knowledge so by design an interest group can not try to manipulate the other groups' perception of how their tasks affects these other groups cost. For this reason this characteristic was not included in the text. In principle, however, the model could be extended to include this additional information asymmetry. The MST does put much effort into influencing policy through this additional channel by portraying land reform as complementary to other policies such as reducing poverty and crime in the cities as many landless often end up in urban slums. The MST also consistently portrays environmental policies as being complementary to land reform, such as in a document they released called "The MST and the Environment: Land Reform is a Way to Care for the Environment" (translated from Portuguese, cited in Lacey and Oliviera, 2001). For discussion on the relationship of the MST and the environment see Alston, Libecap and Mueller 1999a and 2000; Wright and Wolford, 2003: chap. 3; and Harnecker, 2003: chap. 9, 600-602). Despite their pro-environmental rhetoric, it is likely that the large number of settlement projects harm the environment. The experience has been that most settlements already have a very hard time at becoming economically viable even in the best of circumstances. Being additionally constrained not to exploit the natural resources within their reach would necessarily make it more difficult. Faced with this trade-off (which the rhetoric tries to play down) the natural choice is to choose survival over nature.

for particularistic programs through manipulation of information in the media. We show that such groups may lack the attributes normally associated with lobby success: financial resources and voter participation.

To illustrate the applicability of our model, we chronicle the actions of the Landless Peasants Movement in Brazil in galvanizing urban voter support for rural land redistribution by using orchestrated media events. The MST is an interest group that has had a profound effect on policy yet lacks large lobbying financial resources and a large direct voting bloc. By molding the information available to urban voters in a manner not possible by the competing interest (land owners), the MST can generate broad urban support for its land reform agenda.

The MST matches the three characteristics from our model that increase the relative success of utilizing the media to sway public policy: i) a low-cost means of attracting attention, due mainly to its ready supply of landless settlers willing to undertake extreme hardships in their quest for land; ii) credibility and a worthy cause which make the information they impart to voters about the government's land reform effort noticeable and believable; and iii) a benefit from urban voters caring about land reform and seeing the President as responsible for delivering results. Our model of interest group behavior is general to any interest group that has the sympathy of the public at large and a comparatively low-cost means of generating that interest.

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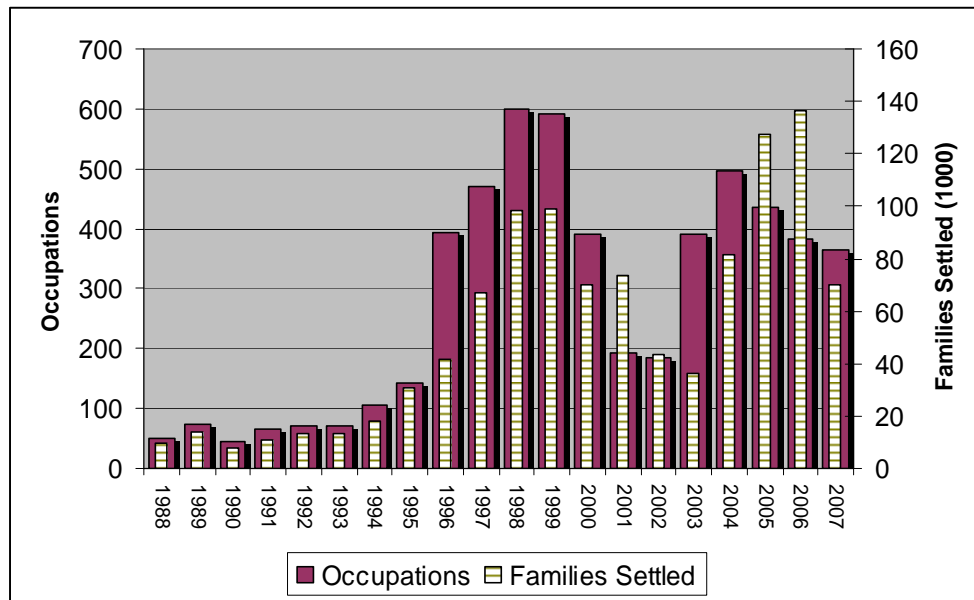
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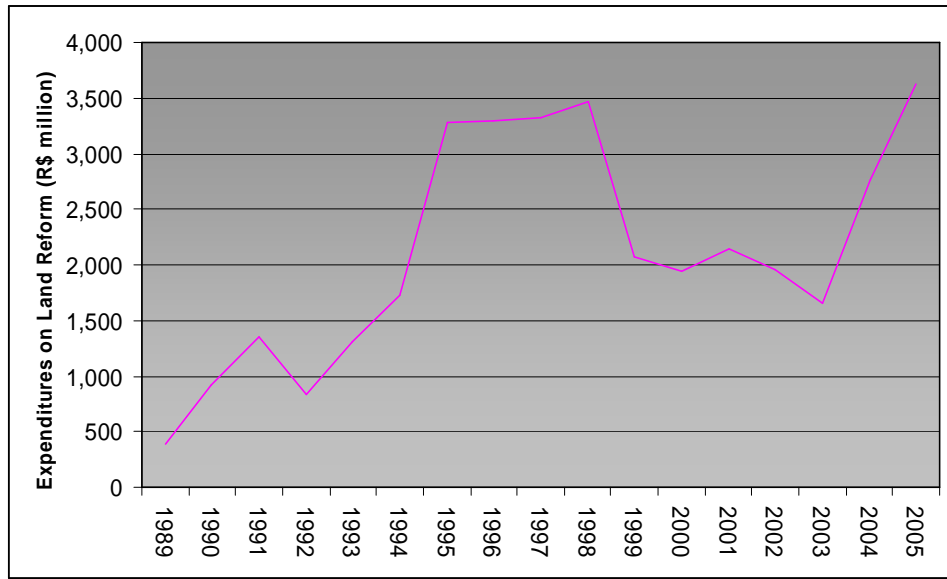
Graph 1 – MST Action (Occupations) and Government Reaction (Settled Families).⁴⁰



Source: Ministério do Desenvolvimento Agrário (2004: 20), MDA/INCRA Balanço de 2007 (2008). Comissão Pastoral da Terra (2004:13). Note: Data for number of families settled from 1988 to 1994 is the average for each government; Sarney (1988-89), Collor (1990-91), Franco (1992-94).

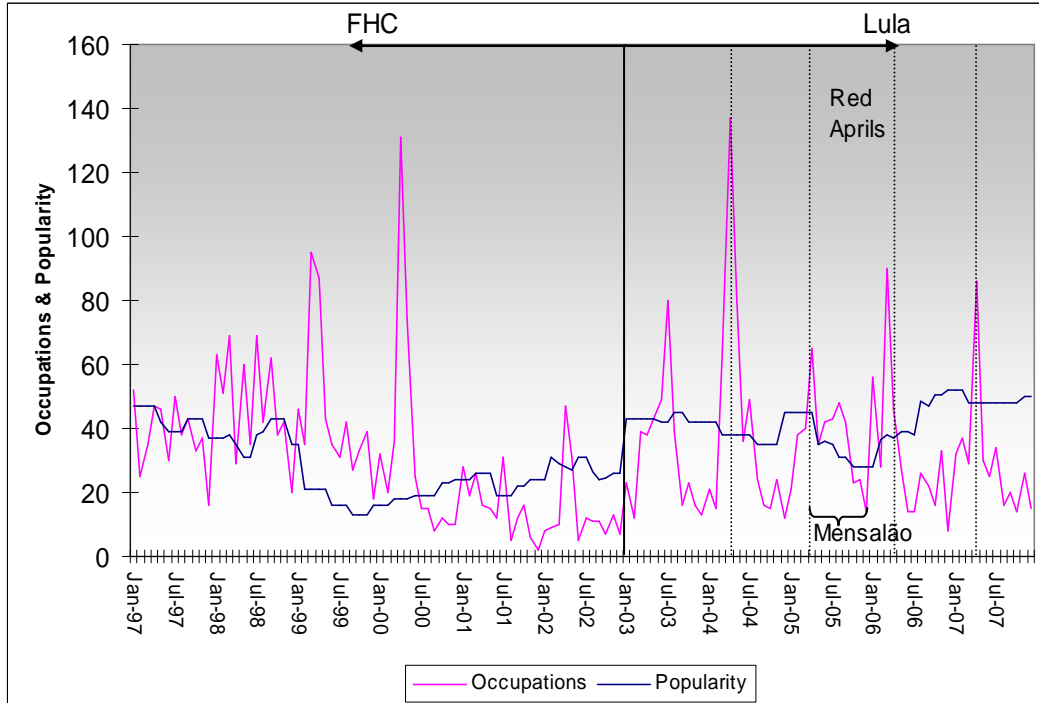
⁴⁰ Data on the number of families settled is highly controversial as this is the main indicator in the public debate on how much land reform the government has achieved. There is a constant war of numbers between the government and the MST, involving also academia and the media, as to what has in fact been accomplished. Despite some attempts at doing a census of settlement projects the controversy persists in part due to the political nature of the issue and in part due to the sheer logistic difficulty of counting settled families in what is a very dynamic setting where new settlements are constantly being created and where beneficiaries are constantly selling, trading and abandoning their land. If, for example, new families have been settled in an old abandoned settlement project, should they be counted as fulfilling part of the government's target? The numbers in Graph 1 are from the Lula government and revise downward the claims by the Cardoso government for 1995-2002.

Graph 2 – Expenditures on Land Reform and Agrarian Organization.



Source: Gasques et al. (2006). Constant R\$ for 2005.

Graph 3 – Number of Occupations and Popularity, 1997-2007.



Source: Popularity is the % interviewed classifying the President's performance as good or very good (Datafolha, 2002). Occupation data from Comissão Pastoral da Terra (several years).

Table 1 – Relationship between Occupations, Settlement Land Reform Expenditures

Direction of Causality	Chi²	p-value
Settlements → Occupations	56.24	0.0000
Occupations → Settlements	73.88	0.0000
Expenditures → Occupations	138.05	0.0000
Occupations → Expenditures	9.52	0.0231
Expenditures → Settlements	21.70	0.0001
Settlements → Expenditures	9.41	0.0243

H₀: X does not cause Y. All three variables are found to be I(0) at 1%, 5% and 10% with one lag, N=16.

Table 2 – Presidential Popularity and Land Reform.

Dependant Variable: Popularity_t	
Popularity _{t-1}	0.821 ^{***} (20.88)
Occupations _{t-3}	-0.063 ^{***} (-4.37)
Exchange Rate _{t-1}	-0.130 ^{***} (-2.62)
Inflation _t	-0.022 ^{**} (-2.05)
Interest _{t-1}	0.040 (1.06)
ΔGDP _t	0.606 ^{**} (2.59)
Lula	0.162 ^{***} (3.82)
Red April Effect	-0.073 [*] (-1.66)
Corruption Scandal <i>Mensalão</i>	-0.091 ^{**} (-2.24)
World Cup 1998	0.136 ^{**} (2.39)
World Cup 2002	0.083 (1.37)
World Cup 2006	0.071 (1.26)
Constant	0.783 ^{**} (4.86)
N	129
R ²	0.94
(Adj. R ²)	(0.93)
F(12, 116)	153.57
Prob>F	0.0000
Durbin-Watson d-statistic (13, 129)	2.02

Notes: Ordinary least squares with standard errors in parentheses. 1percent ^{***}, 5percent ^{**}, 10percent ^{*}. All continuous variables in logarithms except inflation and GDP due to negative values. All continuous variables I(1) at 1%. H₀: No cointegration is rejected: Phillips-Peron Z_p = -136.44^{***}, Phillips-Peron Z_t = -11.421^{***}, ADF (MacKinnon (1996) critical values) = -11.458^{***}, Johansen cointegration test rejects H₀ of no cointegrating equations with a trace statistic = 147.68 (1percent critical value = 111.01) and Max-Eigen statistic = 52.93 (1percent critical value = 46.82).

Appendix

General version of the multi-principal, multi-task model of interest group politics.

Suppose $n+1$ principals, composed of n interest groups plus voters and the government as the agent. Each of the $n+1$ principals is interested in a specific task that they would like the agent to perform. In general the principals do not observe the level of effort, t , placed by the government in each task, instead they observe the outcome, x , of that effort.

The vector of outcomes is modeled as $\mathbf{x} = \mathbf{t} + \boldsymbol{\varepsilon}$, or:

$$\begin{pmatrix} x_1 \\ x_2 \\ \vdots \\ x_{n+1} \end{pmatrix} = \begin{pmatrix} t_1 \\ t_2 \\ \vdots \\ t_{n+1} \end{pmatrix} + \begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_{n+1} \end{pmatrix} \quad (\text{A1})$$

where $\boldsymbol{\varepsilon} \sim N(0, \boldsymbol{\Omega})$ and $\boldsymbol{\Omega}$ is the covariance matrix of the random noise variable $\boldsymbol{\varepsilon}$. $\boldsymbol{\Omega}$ is a $(n+1) \times (n+1)$ matrix with principal diagonal ω_{ii} , $i=1, 2, \dots, n+1$, and zeros elsewhere.

Principal i benefits from the government's actions according to the benefit functions b_i , which can be written as $\mathbf{b}^i \mathbf{x}$, where b_j^i is the benefit of outcome j , $j=1, 2, \dots, n+1$, to principal i . The cost to politicians of directing effort in both of the tasks is modeled as the

following quadratic function $\frac{1}{2} \mathbf{t}' \mathbf{C} \mathbf{t}$ where the $(n+1) \times (n+1)$ matrix \mathbf{C} is assumed positive

definite. If the off-diagonal terms are positive there will be substitution amongst types of effort, so that an increase in t_i will imply a decrease in t_j , and vice-versa. If these terms are negative the types of effort will be complementary

Following Dixit (1996) we first assume a benchmark case where the principals observe the levels of effort chosen by politicians and additionally are able to act cooperatively so as to reach the first-best solution.

Observable effort and united principals

We assume that the agent's efforts in pursuing the $n+1$ tasks are rewarded with political support from each of the principals. The support is in the form of monetary contributions and votes. Let the support provided by each principal be p_i . The total level of political support received is the sum of the support contributed by each $n+1$ principals,

$p = \sum_{i=1}^{n+1} p_i$. Offering political support imposes on the principals an opportunity cost so we can treat p in monetary terms. That is, p can be thought of as the amount of resources that the politicians would require for advertising and campaigning to achieve an equivalent amount of support. The pay-off to politicians is thus $w = p - \frac{1}{2} \mathbf{t}' \mathbf{C} \mathbf{t}$. The politicians' utility function is assumed to have the following constant risk-aversion form:

$$U(w) = -\exp(-rw) \text{ or } -\exp(-r(p - \frac{1}{2} \mathbf{t}' \mathbf{C} \mathbf{t})) \quad (\text{A2})$$

where r is the risk-aversion coefficient. Note that politicians will maximize $w = p - \frac{1}{2} \mathbf{t}' \mathbf{C} \mathbf{t}$, the income equivalent of their utility.

The expected return to the principals acting together is their benefit minus the value or cost of providing political support to politicians.

$$E[b' \mathbf{x} - p] = E[b'(\mathbf{t} + \boldsymbol{\varepsilon}) - p] = b' \mathbf{t} - p \quad (\text{A3})$$

The total surplus is therefore the sum of the agent's and the principals' net benefit

$b't - p + p - 1/2t'Ct = b't - 1/2t'Ct$. Note that the level of political support cancels out, so we assume that p is high enough for the agent to stay in the game, that is, the government will not abandon these policies. The level of effort will be chosen to maximize this function, giving as the first-order condition $\mathbf{b} - \mathbf{C}\mathbf{t} = 0$, so that the first best level of effort is:

$$\mathbf{t} = \mathbf{C}^{-1}\mathbf{b} \quad (\text{A4})$$

where \mathbf{C}^{-1} is the inverse of the \mathbf{C} matrix.

Asymmetric information and united principals

Because effort is now no longer observable to general voters, contracts between the principals and politicians must be made contingent on \mathbf{x} (outcomes) and no longer on \mathbf{t} (effort). Following Dixit (1996) and Holmström and Milgrom (1991) we use a linear reward scheme to stipulate the legislators' pay-offs given outcomes \mathbf{x} . That is, given the observed outcomes \mathbf{x} , the united principals provide politicians political support that has the following monetary equivalent:

$$\alpha'x + \beta \text{ or } \left| \begin{array}{c} \alpha_1 \\ \alpha_2 \\ \dots \\ \alpha_{n+1} \end{array} \right| \begin{array}{c} x_1 \\ x_2 \\ \vdots \\ x_{n+1} \end{array} + \beta \quad (\text{A5})$$

where the α s are the value of the marginal support given by the principals to government effort and β is a fixed payment that can be adjusted to assure the agent's reservation utility is at least matched.

Thus the politicians' utility is now $-\exp(-r(\alpha'x + \beta - 1/2t'Ct))$, which can be shown to equal⁴¹ $-\exp(-r\alpha't + 1/2r^2\alpha'\Omega\alpha - r\beta + 1/2rt'Ct)$ so that the government will now maximize the income equivalent of their utility, which is $z = \alpha't - 1/2r\alpha'\Omega\alpha + \beta - 1/2t'Ct$. This yields the following first-order conditions:

$$\mathbf{t} = \mathbf{C}^{-1}\alpha \quad (\text{A6})$$

Note that the α s are the value of the marginal support given by the principals to reward the government's effort. Letting k be the elements of \mathbf{C}^{-1} , $k_{jj} > 0$ and $k_{jh} \geq 0$ or ≤ 0 , for $j \neq h$, so an increase in the marginal support of the united principals to politicians, α_j , leads to increased effort in task j and an increase or a decrease in effort towards the other tasks.

In order to understand the relationship of α in (A6) and \mathbf{b} in (A4) substitute (A6) into the government's income equivalent of utility, z , to get $z = 1/2\alpha'\mathbf{C}^{-1}\alpha - 1/2r\alpha'\Omega\alpha + \beta$. The net benefit of the principals is the expected value of their total benefit minus the value, or cost, of the support they give the government, $E[\mathbf{b}'\mathbf{x} - \alpha'x - \beta] = (\mathbf{b} - \alpha)'t - \beta$. The joint surplus of the united principals and politicians is the sum of their net benefits:

$$\mathbf{b}'\mathbf{C}^{-1}\alpha - 1/2\alpha'(r\Omega + \mathbf{C}^{-1})\alpha \quad (\text{A7})$$

This can be maximized with respect to α to obtain the following first-order condition:

$$\mathbf{b} = (\mathbf{I} + r\mathbf{C}\Omega)\alpha \quad (\text{A8})$$

Note that if; (i) all elements of \mathbf{C} are positive (assuming substitutability amongst tasks); (ii) the elements of Ω are positive, because they are variances; (iii) the α s are positive, because the united principals will not want negative effort, it must be that $b_j > \alpha_j$.

⁴¹ See Dixit (1996, pg. 161).

Consequently, comparing (A4) to (A6) it turns out that the government optimally chooses less effort when effort is not observable than in the first-best situation where it is, that is, it is a second-best due to moral hazard arising from information asymmetries.

Asymmetric information and multi-ple principals

In general principals do not act cooperatively, so we now derive the optimal levels of effort allowing for non-cooperative behavior in addition to asymmetric information. In order to do this we will find the Nash equilibrium of the game where each principal strategically takes into account the actions of the other principals. Now each principal provides his own agenda to politicians. Principal i 's incentive scheme for task j is $\alpha_j^i x + \beta^i$ while the total for each principal is $\alpha^i x + \beta^i$. The aggregate incentive scheme faced by legislators is the sum of that offered by each principal and is simply $\alpha x + \beta$, where $\alpha = \sum \alpha^i$ and $\beta = \sum \beta^i$. The marginal benefit function for principal i is $b^i = [b_1^i \ b_2^i \ \dots \ b_{n+1}^i]$.

The government still maximizes its certainty equivalent and choose effort according to $t = C^{-1} \alpha$. In order to find the Nash equilibrium of this game we follow Dixit (1996:163-166) and consider the contribution of each of the principals to the legislators' certainty equivalent. This is then added to the benefit that each principal receives from the relationship with politicians. The resulting bilateral surplus between principal i and politicians is:

$$b^i C^{-1} \alpha^i - r \alpha^{-i} \Omega \alpha^i - \frac{1}{2} \alpha^{i'} (C^{-1} + r \Omega) \alpha^i \quad (A9)$$

where $\alpha^{-i} = \sum_{h \neq i} \alpha^h$, the sum of the incentives by all other principals apart from i .

If we assume that the only choice variable available to principal i is the support it gives directly to legislators through votes and/or money, then the maximization of this objective function with respect to α^i gives:

$$b^i = (I + r C \Omega) \alpha^i + r C \Omega \alpha^i \quad (A10)$$

Adding the individual benefit of each principal gives us an expression for the total benefit arising from the Nash equilibrium:

$$b = \alpha + (n+1) r \Omega C \alpha \quad (A11)$$

This equation can be compared to equation (A8), the total benefit that resulted when principals were able to act cooperatively: $b = (I + r C \Omega) \alpha$. Remembering that when $\alpha = b$ and the first-best solution is achieved, we can see that with non-cooperative principals a situation is reached that is even further from first-best than with unified principals, since r is now multi-plyed by $n+1$. The situation is therefore a third-best, characterized by apparent inefficiencies and low-powered incentives.

For greater ease in visualization, the system of equations in (A11) can be written as follows:

$$b_i^j = \alpha_i^j + r \sum_{k=1}^{n+1} (c_{i,k} \omega_{kk} (\sum_{h=1}^{n+1} \alpha_k^h)) \quad \forall i, j, k, h = 1, 2, \dots, n+1 \quad (A12)$$

Note that each of the $(n+1)^2$ equations in this system contains the terms ω_{kk} ($k=1, 2, \dots, n+1$), which represent the variance of the noise between the observable outcomes x^k and the unobservable effort t^k . Therefore, the higher the value of any given ω_{kk} , the larger will be the wedge between the first-best situation, $b_i^j = \alpha_i^j$, and the third-best situation depicted in (A12). In other words, the greater the information asymmetry concerning

legislators' efforts in any given task, the more low powered will be the incentives given by the principals for efforts towards that task.

Affecting information availability to pursue policy

The above suggests that each of the $n+1$ principals can influence policy not only through direct incentives (cash, votes) represented by α^i , but also by affecting the level of information available concerning politicians' efforts in each task, that is, on each of the $n+1$ ω_{kk} 's. The problem faced by each interest group then becomes that of deciding not only the optimal level of α^i_j to allocate for each task j , but also on how much effort it will place towards affecting the information available to general voters regarding each of the tasks. Let the effort by each interest group i to influence the information concerning legislators' efforts in each task j be $e^i = [e_1^i \ e_2^i \ \dots \ e_{n+1}^i]$. Note that effort is costly, where the cost of that effort is represented by the cost function $G^i(e^i)$. Note also that all other interest groups may also expend efforts to affect information availability, so that the solution will be a Nash Equilibrium. Let e^{-i} be the vector of effort of all interest groups other than i . Interest group i 's objective is no longer to maximize (A9) with respect to α^i but rather to maximize the following objective function with respect to α^i and e^i taking α^{-i} and e^{-i} as given:

$$b^i C^{-1} \alpha^i - r \alpha^{-i} \Omega(e^i, e^{-i}) \alpha^i - \frac{1}{2} \alpha^i (C^{-1} + r \Omega(e^i, e^{-i})) \alpha^i - G^i(e^i) \quad (A13)$$

Note that the difference of (A13) to (A9) is the cost function and the fact that the matrix of information variances is now a function of the level of effort by each principal to influence information. The first order conditions for the maximization of (A13) are:

$$C^{-1} b^i - r \Omega \alpha^{-i} - (C^{-1} + r \Omega) \alpha^i = 0 \quad (A14)$$

$$-r \Omega^i a^i - \frac{1}{2} r \Omega^i \alpha^{2i} - G_e^i = 0 \quad (A15)$$

where $a^i = [\alpha_1^{-i} \alpha_1^i \ \alpha_2^{-i} \alpha_2^i \ \dots \ \alpha_{n+1}^{-i} \alpha_{n+1}^i]$, $\alpha^{2i} = [(\alpha_1^i)^2 \ (\alpha_2^i)^2 \ \dots \ (\alpha_{n+1}^i)^2]$,

$$G_e^i = \left| \frac{\partial G^i(e_1^i)}{\partial e_1^i} \quad \frac{\partial G^i(e_2^i)}{\partial e_2^i} \quad \dots \quad \frac{\partial G^i(e_{n+1}^i)}{\partial e_{n+1}^i} \right| \text{ and } \Omega^i = \begin{vmatrix} \frac{\partial \omega_{11}(e_1^i, e_1^{-i})}{\partial e_1^i} & 0 & \dots & 0 \\ 0 & \frac{\partial \omega_{22}(e_2^i, e_2^{-i})}{\partial e_2^i} & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & \frac{\partial \omega_{n+1, n+1}(e_{n+1}^i, e_{n+1}^{-i})}{\partial e_{n+1}^i} \end{vmatrix}$$

The first order conditions in (A14) are a system of $n+1$ equations that define α^{i*} , the $n+1$ optimal incentives by principal i for each task. The interpretation of these equations is as before in (A10); the principal will offer a third-best level of incentive for each task due to the information asymmetries and the existence of n other principals who are also providing incentives to the government.

The first order conditions in (A15) are also a system of $n+1$ equations. They define e^{i*} , the optimal level of effort that principal i will place towards affecting information availability on each of the $n+1$ tasks. The two terms on the left of each equation in that system shows how much the marginal effort increases or reduces the wedge between the first-best situation $b^i = \alpha^i$ and the third-best situation $b^i = \alpha^i + r C \Omega \alpha$ (derived from (A14)).