Lame Ducks and the Media: Does the Press Turn on Unpopular Governments?*

Oliver M. Latham
University of Cambridge

February 12, 2011

Abstract

We ask whether media organisations turn on unpopular governments and if so, why? We construct a model in which the media has a greater incentive to attack unpopular governments because they are unlikely to remain in power and so cannot commit to grant favours in future periods. We look for a causal relationship between government popularity and media coverage consistent with our model by using a unique data set of British newspapers to examine whether corruption investigations into government politicians receive more coverage when the government is behind in the polls. Instrumenting for poll leads with macroeconomic variables, which should be uncorrelated with unobserved determinants of media coverage, we find that a one standard deviation increase in a government's poll lead results in investigations receiving between 30 and 60 percent less coverage. (JEL D72, D73, L82)

1 Introduction

There appear to be systematic differences in the media's treatment of popular and unpopular governments. It is a common complaint of administrations in their last days of office that their ability to set the media agenda slips away: negative stories start to dominate news coverage, and it becomes increasingly difficult to advance a policy agenda. There is also anecdotal evidence in the UK[1] that, whereas the media may gloss over scandals affecting popular governments, the same indiscretions can attract vitriolic coverage when a government's power is on the wane. Some media outlets, such as the Sun newspaper in the UK, also display a tendency to "back a winner", switching their public endorsements as

*I am grateful to Toke Aidt, Dean Corbae, Tom Crossley, Robert Evans, Andrea Prat, Daniel Quigley, Ansgar Walther, Melvyn Weeks, Frank Windmeijer and seminar participants in Cambridge, Brunel University and at the Econometric Society World Congress for helpful comments and suggestions.

[1] e.g. http://www.telegraph.co.uk/news/election-2010/7671436/General-Election-2010-Gordon-Brown-was-undone-by-the-media-not-Gillian-Duffy

soon as the tide of public opinion seems to be flowing away from the incumbent and towards the opposition.

If this results from strategic considerations on the part of the media then there could be important welfare implications: most voters rely on the media to inform them of the merits of government policy. If voters don't know whether negative coverage of an unpopular government's policies results from strategic considerations or genuine concerns on the part of the media, then welfare enhancing policies might end up attracting significant opposition. Similarly, popular governments may not receive sufficient scrutiny and may be able to pursue policies that would not survive a more critical inspection by the media.[2]

The question as to whether the media turns on unpopular governments for strategic reasons has not attracted much theoretical or empirical attention in the Political Economics literature. A possible explanation for this is the difficulty in unravelling the endogeneity issues involved. The media may indeed cover-up negative stories about popular governments and attack unpopular ones for strategic reasons. However, an equally plausible explanation is that corrupt or incompetent governments are likely to be both less popular and attract more negative media coverage. Empirical analysis is complicated still further by the fact that media outlets can help determine a government's level of popularity through the material they publish and the prominence they give to different stories.

In this paper we provide an intuitively appealing explanation for why the media might turn on unpopular governments and empirical evidence that this occurs in the UK. Unpopular governments are less likely to remain in office and hence cannot credibly commit to granting favours to the media in future periods. This gives the media a greater incentive to publish anti-government stories when the government is already unpopular. This incentive may make collusive agreements that require the media to suppress negative stories in every period unsustainable and so instead the media and government must coordinate on an alternative equilibrium that involves collusion only while the government is popular.

We test the main implication of our model, that unpopular governments should receive more negative media coverage. We measure the extent of negative media coverage using the approach of Puglisi and Snyder (2010) by examining the level of coverage UK newspapers give to corruption investigations into government MPs by the House of Commons Standards and Privileges Committee. We then examine whether investigations get systematically more coverage when the government is behind in the polls.

We combat endogeneity concerns by instrumenting for the government's poll lead with inflation and unemployment. These are major determinants of government popularity (Nannestad and Paldam (1994)), but should be uncorrelated with unobserved determinants of the level of newspaper coverage. We find

[2] An example of the first effect is the recent bank "bailouts" in the US and UK: these were designed by unpopular governments and received substantial negative coverage in the media, despite appearing, in retrospect, to have prevented a wholesale collapse of the banking system. The lead up to the invasion of Iraq might be a candidate for the second.

robust evidence of a negative effect of government popularity on the level of newspaper coverage. This effect is also economically significant: a one standard deviation decrease in a government's lead in the polls increases coverage by around 60%. We go on to show that this effect is not present for newspapers which are ideologically similar to the incumbent government and also find some evidence that the effect is magnified in election years.

This paper contributes to the growing literature on the role of the media in democracies. Previous work includes attempts to quantify media bias and determine its electoral effects: Puglisi (2006); Puglisi and Snyder (2010); Groseclose and Milyo (2005); DellaVigna and Kaplan (2007) and provide a theoretical explanation for how media bias can persist in equilibrium: Gentzkow and Shapiro (2006); Baron (2006); Mullainathan and Shleifer (2005). While other work has examined how voter access to media sources changes policy outcomes: Strömberg (2004); Besley and Burgess (2002).

The most relevant strand of the literature to this paper is that begun by Besley and Prat (2006). It is concerned with determining when the media sector will be "captured" by government and cease to be a constraint on its excesses. We add government popularity as a factor which may cause the media to stop providing useful information to voters about their rulers. We do not know of any work that explicitly examines this relationship. However, in the broader Political Economics literature Snyder (1990) has shown the importance of politicians' election chances in determining campaign contributions.

This paper therefore provides econometric evidence for a causal relationship between government popularity and negative media coverage and an intuitive theoretical explanation for why it occurs. This relationship has not been studied previously and has important implications for the reliability of media reporting in developed democracies.

The paper is structured as follows: Section 2 provides some motivation by presenting anecdotal evidence from recent British political history. Sections 3 and 4 present the model and derive the equilibria of interest. Section 5 discusses the robustness of the theoretical results. Section 6 presents our empirical strategy and results and Section 7 concludes.

2 Political Scandals in the UK

In this section we present anecdotal evidence from the UK that is consistent with our hypothesis. Examples of the media choosing to aggressively pursue unpopular governments are not hard to come by; the two largest scandals in recent British political history have afflicted governments close to electoral defeat.

The first, from 1993 until 1997, affected a Conservative government. The Conservative party had been in power for 14 years and won four general elections. However, following the UK's withdrawal from the Exchange Rate Mechanism in 1992, it had lost its reputation for economic competence and was behind the opposition Labour party in the polls.

In an attempt to address this the Conservatives launched an initiative "Back

to Basics" that emphasised personal probity and traditional family values. The media's response was to subject MPs' private lives to increased scrutiny and soon a wave of lurid allegations were appearing in the press. This was followed by the "Cash for Questions" scandal in which the Guardian newspaper uncovered evidence that Conservative MPs had taken money from wealthy individuals to ask questions in House of Commons debates.

The last Labour government suffered a similar fate. By 2008 it was also behind the opposition in the polls and seemingly heading for electoral defeat. It too was struck by a wave of scandals: The Daily Telegraph, a prominent, rightward-leaning newspaper, began publishing allegations of abuse of expenses claims by MPs. The allegations affected all parties, but the emphasis in the coverage from newspapers of all ideological persuasions was on senior government figures, a large number of whom had to resign.[3]

As well as seeing unpopular governments receiving vitriolic coverage, our hypothesis predicts that popular governments should be subjected to less media scrutiny. One potential example is the "Ecclestone Affair" which hit Tony Blair and the Labour party just months after their election in 1997 and while they were still enjoying an unprecedented level of popularity. The Labour Government had moved to ban tobacco advertising at all sporting events. However, at an extremely late stage, a move was made to exempt motor racing from the legislation. It soon emerged that Bernie Ecclestone, a business man with a major interest in Formula 1 motor racing, had made a one million pound donation to the Labour Party.

Tony Blair assured the public that the decision to alter the legislation had been made prior to the receiving of the donation and denied any wrong-doing. The donation was returned and the media storm eventually subsided until, in 2008, it emerged that the decision to exempt motor racing had indeed been made following a meeting with Bernie Ecclestone, leading to claims that the media failed to investigate the allegations sufficiently at the time.

We now present a simple model that explains why the media might brush over the imperfections of popular governments, but hound unpopular ones out of office. We then provide econometric evidence that British newspapers give less coverage to political scandals affecting popular governments.

3 The Model

We consider an infinite time horizon $t \in [0, 1, \ldots \infty)$ in which two agents "the Media" and "the Politician" interact. In each period he is in office the Politician receives an exogenously-given ego rent, R, and chooses whether or not to make a transfer to the Media (whether to set $\varsigma = 0$ or $\varsigma = 1$.) If $\varsigma = 1$ the Politician makes a fixed transfer, A, to the Media. This transfer can be thought of as either a direct bribe or a more subtle policy change that benefits the Media, or the agents who control the Media. Alternatively it could be something more

[3] These included the Home Secretary Jacqui Smith, the Communities Secretary Hazel Blears and, for the first time since 1695, the Speaker of the House of Commons.

innocent, such as providing a reporter with an exclusive interview or a place on the plane to cover the Politician's next foreign trip.

The Politician's per-period utility is given by:

$$u_t^P = I_t^O \left[R - \varsigma_t A \right], \tag{3.1}$$

where I_t^O is an indicator function which equals one if the politician is in office and zero otherwise. We assume that the Politician, once removed, never returns to office and so receives zero utility in all subsequent periods.

The Media's payoff has two components. The first is transfers from the Politician. If the Politician sets $\varsigma_t = 1$, the Media receives a transfer τA with $\tau \leq 1$. As in Besley and Prat (2006), τ can be thought of as measuring the factors preventing collusion between the Media and the Politician: in societies where use of public funds is closely monitored we would expect τ to be low as more "sneaky" and less efficient methods must be used to direct public resources to those interests who control the Media. The Media can also earn revenue by publishing damaging stories about the incumbent. If the Media chooses to publish such a story it receives additional revenue M. Letting $\gamma_t = 1$ indicate that the Media chooses to publish, its per-period utility is given by:

$$u_t^M = \varsigma_t \tau A + \gamma_t M. \tag{3.2}$$

The key state variable of the model is the popularity of the Politician, S_t. We assume that this is either high, H, or low, L, and is determined exogenously by a distribution that is $i.i.d$ across time periods:[4]

$$S_t = \begin{cases} H & \text{with probability } \theta \\ L & \text{with probability } (1-\theta) \end{cases}. \tag{3.3}$$

The Politician's probability of reelection depends on both his popularity and the actions of the Media. If the Media does not publish we normalise the reelection probability of a popular Politician to 1, while a Politician with low popularity is reelected with probability $p < 1$. For simplicity, we assume that, if the Media publishes, these reelection probabilities are adjusted by the factor $q < 1$:

$$\begin{aligned} P\left[\text{reelected} \mid S_t = H, \gamma_t = 0\right] &= 1 \\ P\left[\text{reelected} \mid S_t = H, \gamma_t = 1\right] &= q < 1 \\ P\left[\text{reelected} \mid S_t = L, \gamma_t = 0\right] &= p < 1 \\ P\left[\text{reelected} \mid S_t = L, \gamma_t = 1\right] &= pq. \end{aligned} \tag{3.4}$$

The key requirement for our results is that, while media reporting can influence election outcomes, it cannot fully determine them. We impose this

[4] In section 5 we argue that relaxing this assumption and allowing for persistence in popularity would only strengthen our results.

by assumption, but it is consistent with the stylised facts and could be micro founded from more fundamental factors.[5] As well as being consistent with micro foundations based on rational voters this formulation can also be justified by econometric evidence (DellaVigna and Kaplan (2007)) that suggests the existence of irrational persuasion effects by which the Media can influence voting decisions.

The order of play in a given period is as follows:

1. Nature determines $S_t = \{H, L\}$ which is observed by both players.
2. The Politician chooses whether to make the transfer.
3. The Media decides whether to publish.
4. An Election is held and the incumbent is reelected according to the probabilities in equation (3.4).

This timing implies that the Media can condition its action on the transfer in the current period while the Politician must make his action before he knows whether the Media will publish or not. The rationale for this timing is clearer if we view the transfer as a policy decision that favours the Media: such decisions are likely to take time to reverse whereas the decision to publish damaging news stories can be taken virtually instantaneously.

4 Equilibrium

The infinitely repeated nature of the game leads to a vast multiplicity of equilibria. We simplify the space of equilibria by restricting strategies to depend only on the current popularity level and a binary history that records whether the Media has published damaging stories about the current Politician or the current Politician has ever failed to make a transfer. This simplification leads to there being only four possible equilibria: the One Shot Nash Equilibrium, which specifies no transfers and publications every period, the Full Capture Equilibrium in which the Media never reports and the Politician makes a transfer every period, the Hounding Equilibrium in which the Media and Politician cooperate only for as long as the Politician is popular and finally an equilibrium in which the Media and Politician cooperate only for as long as the Politician is unpopular. This last class of equilibrium has no real-world parallel and exists only under strong parameter conditions so we confine it to the appendix. Because it helps to characterise equilibrium in the wider repeated game we begin our analysis with the One Shot Nash Equilibrium.

[5] We do not proceed down this route for reasons of tractability and because the exact method by which the Media influences electoral outcomes is not our primary concern.

Equilibrium in the One Shot Game

By backward induction there is a unique subgame perfect equilibrium to the one period game. Regardless of whether the Politician makes the transfer, the Media will choose to publish damaging news and earn the additional revenue, M. Foreseeing this, the Politician has no incentive to make the transfer. Hence the unique equilibrium is $\varsigma = 0, \gamma = 1$. This equilibrium serves as the most severe, credible punishment either player can commit to. As such it helps determine equilibrium behaviour in the repeated game.

Strategies and Equilibrium in the Repeated Game

We restrict players' strategies to depend only on actions in the current period, the current level of popularity S_t and whether there has been a breakdown in cooperation between the Media and the *current* incumbent. This allows us to simplify the set of all possible histories into the payoff-relevant history, $\tilde{H}_t = \{Y, N\}$ which records whether cooperation has broken down. Whenever a new incumbent enters the history is N. However, as soon as either the Politician fails to make a transfer or the Media publishes damaging stories, the history switches to Y where it remains until a new Politician enters office.

Because we are interested in determining the weakest conditions under which collusive agreements can be sustained we assume that, once a defection has occurred and $\tilde{H}_t = Y$, play reverts to the One Shot Nash until the Politician is removed. This represents the strongest punishment either player can credibly commit to. However, once a new Politician enters office the history reverts to N and cooperation can resume.

This "clean slate" assumption is crucial to our analysis: a newly elected politician does not condition his actions on the interactions of the Media with previous Politicians. We believe that this assumption is plausible: a politician is unlikely to punish the media for driving his political opponent from office. The implication is that the Media can break an agreement with the incumbent safe in the knowledge that, while it will be punished while he remains in power, it can start afresh once a new Politician enters office.

Each player's strategy is a mapping from observed actions in the current period, the Politician's current popularity level and the payoff-relevant history onto their set of possible actions:[6]

$$\begin{aligned} \sigma^P : \{H, L\} \times \{Y, N\} &\rightarrow \{0, 1\} \\ \sigma^M : \{H, L\} \times \{Y, N\} \times \{0, 1\} &\rightarrow \{0, 1\}. \end{aligned}$$

We define an equilibrium as a situation where there is no profitable deviation for any player at any popularity level or history given the other player's strategy. Formally, we can aggregate popularity and the payoff-relevant history into four

[6] This definition incorporates the timing assumptions by allowing the Media to condition its action on the Politician's action in the current period.

possible states: $K_t = \{(L,Y),(H,Y),(L,N),(L,Y)\}$. Once we have defined the payoff-relevant history as part of the state the solution concept is pure strategy Markov Perfect Equilibrium (MPE). The Politician's strategy $\sigma^P(K)$ determines actions $\varsigma_t \in \{0,1\}$ as does the Media's strategy $\sigma^M(K,\varsigma)$. A pure strategy profile $\left(\widetilde{\sigma}^P, \widetilde{\sigma}^M\right)$ is an MPE if both players are maximising in every state given the other's strategy. Formally, if it maximises the pair of Bellman equations:

$$\begin{aligned} V^P(K) &= \max_{\widetilde{\sigma}^P}\left[R - A\varsigma\left(\widetilde{\sigma}^P, \widetilde{\sigma}^M\right) + \beta\sum_{K'} V^P(K')\, P\left[K' \mid K, \widetilde{\sigma}^P, \widetilde{\sigma}^M\right]\right] \\ V^M(K) &= \max_{\widetilde{\sigma}^M}\left[\tau A\varsigma\left(\widetilde{\sigma}^P, \widetilde{\sigma}^M\right) + M\gamma\left(\widetilde{\sigma}^P, \widetilde{\sigma}^M\right) + \beta\sum_{K'} V(K')\, P\left[K' \mid K, \widetilde{\sigma}^P, \widetilde{\sigma}^M\right]\right]. \end{aligned}$$

Because play reverts to the One Shot Nash as soon as the Politician withdraws the transfer or the Media publishes damaging news and actions are not allowed to depend on anything except the state and actions within the current period, our restrictions on strategies lead to there being only four potential equilibria: the One Shot Nash in which there are no transfers and the media publishes damaging news every period, the Full Capture Equilibrium in which there are transfers and suppression of news in states (H,N) and (L,N), the Hounding equilibrium in which the Politician and Media specifies cooperation only in state (H,N) and an equilibrium that specifies cooperation only in state (L,N). We now characterise the Full Capture and Hounding Equilibria and show that the Hounding Equilibrium can exist under weaker conditions. The last equilibrium is analysed in the appendix.

The Full Capture Equilibrium

In the Full Capture Equilibrium, the threat by both players to revert to the One Shot Nash in the event of either a withdrawal of transfers or the publication of damaging news is enough to ensure that the Politician always makes the transfer and the Media never publishes, regardless of the Politician's popularity. Formally, the strategy profile is:

$$\begin{aligned} \varsigma &= \begin{cases} 1 & \tilde{H}_t = N \\ 0 & \text{otherwise} \end{cases} \\ \gamma &= \begin{cases} 0 & \tilde{H}_t = N \\ 1 & \text{otherwise} \end{cases}. \end{aligned}$$

Before presenting the results it is helpful to introduce some notation. We define $V^i\left[S, \tilde{H}, A\right]$ as player $i's$ value function if he takes action A, given history $\tilde{H}$ and popularity S and $W^i\left[\tilde{H}\right]$ as player i's post-election continuation value,

which gives the expected continuation payoff after the election has occurred, but before next period's popularity is known. Because popularity is $i.i.d$ across periods it depends only on the history, $\tilde{H}$ and not on the level of popularity in the current period.

Equilibrium requires that the Media has no profitable deviation in any state. Once the history is Y and cooperation between the Media and the incumbent politician has broken down this holds trivially as play reverts to the One Shot Nash. When the agreement has not broken down and the history is N the Media's payoff from publishing damaging news must be less than that from not doing so, regardless of the Politician's level of popularity:

$$V^M[S, N, \gamma = 0] \quad \geq \quad V^M[S, N, \gamma = 1] \quad \text{for } S \in \{L, H\} \tag{4.1}$$

In the appendix we show that these constraints can be rewritten in terms of the post-election continuation values as:

$$\beta pq\left[W^M[N] - W^M[Y]\right] \quad \geq \quad M \text{ for } S = L \tag{4.2}$$

$$\beta q\left[W^M[N] - W^M[Y]\right] \quad \geq \quad M \text{ for } S = H. \tag{4.3}$$

If the Media chooses to publish damaging news it receives a benefit in the form of additional revenue, M. However, it also incurs a cost because, once it publishes, the history will change to Y, cooperation will break down and it will not receive a transfer for as long as the incumbent Politician remains in power. The expected cost of lost cooperation is captured by the difference in post-election continuation values, $W^M[N] - W^M[Y]$. This is always non negative because, when the history is N the Media has the option of defecting and getting the continuation value $W^M[Y]$.

Examining (4.2) and (4.3) we see that, when the Politician is unpopular, the Media discounts the loss of cooperation with a smaller discount factor βpq. Intuitively, if the Politician loses the election the history will revert back to N and cooperation can resume. An unpopular Politician is more likely to lose the election and hence the expected cost of reduced cooperation is lower. This means that the constraint in the low state is always tighter and hence the Media's cooperation is easier to sustain when the Politician is popular.

We also require that the Politician has no profitable deviation at any popularity level given the Media's strategy. Again this follows trivially once cooperation has broken down. Hence the incentive compatibility condition is that he weakly prefers to make the transfer when the history is N:

$$V^P[S, N, \varsigma = 1] \quad \geq \quad V^P[S, N, \varsigma = 0] \quad \text{for } S \in \{L, H\} \tag{4.4}$$

The Politician also faces a trade off. If he chooses to withdraw the transfer he increases his payoff in that period. However, play will revert to the One Shot Nash and the Media will immediately start to publish damaging stories, reducing his reelection chances. His cooperation can only be maintained if the

discounted cost of reduced cooperation is large relative to the transfer. Again this intuition can be restated in terms of the post-election continuation values as:

$$\beta p\left[W^P[N] - qW^P[Y]\right] \geq A \text{ for } S = L \tag{4.5}$$
$$\beta\left[W^P[N] - qW^P[Y]\right] \geq A \text{ for } S = H \tag{4.6}$$

The Politician will not defect provided the weighted difference in post-election continuation values, $W^P(N) - qW^P(Y)$ is large relative to the cost of the transfer. The continuation value for history Y is reduced by the additional factor q because the Media will immediately start to publish damaging news following a withdrawal of the transfer. This reduces the chances of him remaining in office to receive the continuation value $W^P[Y]$ and so increases the expected cost of lost cooperation.

The Politician also has a greater incentive to defect when he is unpopular. Again this can be seen from the fact that in (4.5), he discounts the loss from reduced cooperation using a smaller factor βp. Intuitively he calculates that a friendly Media is of no use to him once he is out of office and so he discounts the cost of lost cooperation at a faster rate when he is closer to defeat. This result follows less obviously than it does for the Media. Intuitively there are two opposing effects: a popular leader might believe that he does not need the Media's support to secure his reelection and so choose to stop making transfers. Alternatively he might recognise that, because he is likely to remain in power for some time, he has a greater incentive to keep on good terms with the Media. In our model the second effect dominates.[7] Proposition 1 summarises the key result of this analysis.

Proposition 1. *Cooperation by both players is easier to sustain when the Politician is popular.*

Additional insight can be obtained by calculating critical values of the transfer, A and the ego rent R that are required to sustain the Media and the Politician's cooperation in each state. This is done in Proposition 2. Calculating these critical values also allows us to derive comparative statics.

Proposition 2. *The Full capture equilibrium is sustainable if and only if A and R satisfy:*

$$A \geq A_H^* = \frac{M}{\tau}\frac{1-\beta q\left[p+(1-p)\theta\right]+\beta q}{\beta q} \tag{4.7}$$
$$A \geq A_L^* = \frac{M}{\tau}\frac{1-\beta q(1-p)\theta}{\beta q p} \tag{4.8}$$

and:

[7] This results from the functional form chosen for the reelection probabilities. The assumptions required for Proposition 1 to hold more generally are discussed in Section 5.

$$R \geq R_H^* = A\frac{[(1+\beta)-\beta[\theta+(1-\theta)p]][1-\beta q[\theta+(1-\theta)p]]}{\beta(1-q)} \quad (4.9)$$

$$R \geq R_L^* = A\frac{[1-\beta\theta(1-p)][1-\beta q[\theta+(1-\theta)p]]}{\beta p(1-q)} \quad (4.10)$$

Where $A_L^* \geq A_H^*$ and $R_L^* \geq R_H^*$ so cooperation is easier to sustain when $S = H$

The full set of comparative statics is in the appendix. The most interesting is that for q, which is an inverse measure of the strength of the Media's influence on the election. The critical levels of ego rents are both increasing in q. Intuitively when q increases and the Media's stories have less impact on his reelection chances, the Politician has less to fear from withdrawing the transfer and having the Media publish damaging news. In the extreme case when $q \to 1$ and the Media's attacks have no effect on electoral outcomes, the critical levels of ego-rents tend to infinity.

The opposite relationship holds for the Media, the critical level of transfers are decreasing in q: as the Media becomes more confident of its ability to remove the Politician from office it puts less weight on potential loss of cooperation. Therefore a larger value of the transfer is required to obtain its cooperation today. In the extreme case where $q \to 0$ and the Media can remove an incumbent Politician with certainty, the critical level is undefined: no transfer can maintain the Media's support because there is no threat of reduced cooperation in future. The implication of these two results is that, for any set of parameters, Full Capture is sustainable if and only if q is in some interval $\left[\underline{q}, \bar{q}\right]$. In other words, media capture will not be possible if the Media is either too weak or too strong.

We have seen that both players have a greater incentive to defect when the Politician is unpopular. If Full Capture is unsustainable it is because the temptation to defect in the low popularity state is too great. This observation suggests that, even when Full Capture is unsustainable, it may be possible for the Media and Politician to collude only while the Politician is popular. This is formalised in the next section.

The Hounding Equilibrium

We now turn to the "Hounding Equilibrium" in which the Media maintains a cosy relationship with popular governments but turns on unpopular ones. The new strategy profile is:

$$\varsigma = \begin{cases} 1 & K_t = (H, N) \\ 0 & \text{otherwise} \end{cases}$$

$$\gamma = \begin{cases} 0 & K_t = (H, N) \\ 1 & \text{otherwise} \end{cases}$$

This specifies that the Politician and Media cooperate for only as long as the Politician is popular. As soon as the Politician's popularity is low the Media

will publish damaging news. Foreseeing this the Politician will stop making transfers as soon as he becomes unpopular. Hence in a Hounding Equilibrium we observe a pattern of collusion that matches the stylised facts: the Media colludes with the Politician as long as he remains popular, but turns on an unpopular Politician until he is driven out of office.

More formally, cooperation will continue only as long as the state is (H, N). As soon as the state changes to (L, N), the Politician will withdraw the transfer, the history will change to Y and play will revert to the One Shot Nash until the incumbent is removed. Because the Hounding equilibrium does not require cooperation in low popularity periods, the only incentive compatibility constraint is that neither player has an incentive to deviate in state (H, N). Solving each player's incentive constraint gives the critical values in Proposition 3:

Proposition 3. *Hounding is an equilibrium if:*

$$A \geq A^*_{Hound} = \frac{M}{\tau}\frac{1}{\beta q \theta} \tag{4.11}$$

$$R \geq R^*_{Hound} = A\frac{1-\beta q\left(\theta+(1-\theta)\,p\right)}{\beta(1-q)} \tag{4.12}$$

The Media's critical value no longer depends on p, the reelection probability in the low popularity state. This contrasts with the critical values in the Full Capture Equilibrium when the Politician is unpopular, which were decreasing in p and tended to infinity as $p \to 0$. The Hounding equilibrium does not require cooperation in the periods where the temptation to defect is larger, hence one would expect Hounding to be an equilibrium even when Full Capture is not. Proposition 4 shows this intuition to be correct under a parameter restriction:

Proposition 4. *There exists $\theta^* \in (0,1)$ such that if $\theta \geq \theta^*$ then $R^*_{Hound} \leq R^*_L$ and $A^*_{Hound} \leq A^*_L$ and the Hounding Equilibrium can exist when the Full Capture Equilibrium does not.*

If θ is sufficiently large relative to p there will be a range of values of the transfer and the ego rent, for which a Hounding Equilibrium is sustainable, but Full Capture is not. The reasoning is as follows: a high value of θ implies that the Politician is likely to remain popular in future periods. This means that his threat in the Hounding Equilibrium to revert to the One Shot Nash carries some weight even when the two players know that cooperation will eventually be abandoned. It therefore acts to reduce A^*_{Hound} relative to A^*_L.

A small value for p makes Hounding easier to sustain relative to Full Capture because it implies that an unpopular government is more likely to lose the election. This reduces the cost to the Media of defecting from the collusive agreement in the low state and so increases the incentive for the Media to publish damaging stories (as the Politician is unlikely to remain in office for long to implement a punishment). Because the Full Capture Equilibrium requires cooperation in the low popularity periods and the Hounding Equilibrium does not, the effect is to increase A^*_L relative to A^*_{Hound}.

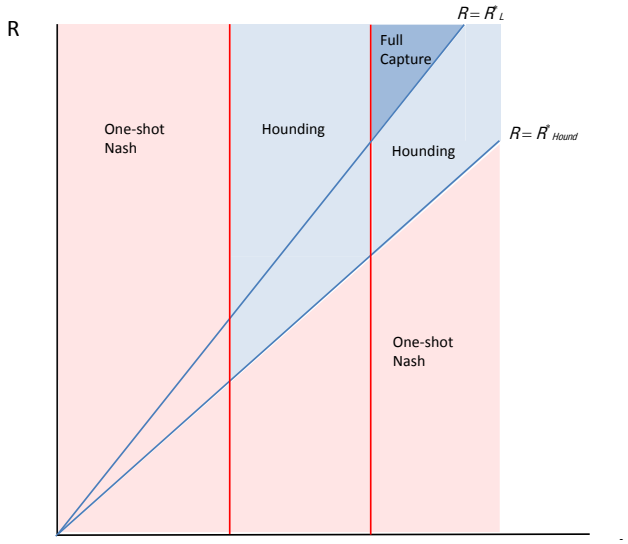

Figure 4.1: Sustainable Equilibria

Characterising Equilibrium

Assuming that the parameter condition in Proposition 4 holds we can summarise the relationship between the model parameters and the sustainable equilibria as follows:

1. One Shot Nash Equilibrium if: $A < A^*_{Hound}$ or $R < R^*_{Hound}$
2. Hounding Equilibrium if: $A \geq A^*_{Hound}$and $R \geq R^*_{Hound}$ and either $R < R^*_L$ or $A < A^*_L$
3. Full Capture Equilibrium if $A \geq A^*_L$ and $R \geq R^*_L$

Figure 1 shows the corresponding values of R and A that are consistent with each class of equilibria. In (A, R) space the incentive-compatibility constraints for the Politician are linear and upward sloping. The constraint for the Hounding Equilibrium has a shallower slope and is below that for the Full-Capture Equilibrium.[8]

Because the Media's payoff is unrelated to the level of ego rents its incentive compatibility constraints are vertical lines. Provided the parameter restriction in Proposition 4 holds, the incentive compatibility constraint for the Hounding Equilibrium will be to the left of that for Full Capture.

[8]As mentioned before there is one more equilibrium that can exist under our restriction on strategies. This specifies cooperation only for as long as the state is (L, N). We characterise this equilibrium in the appendix and show it to be harder to sustain than Full Capture. In Figure 1 the range of parameter values for which this equilibrium is sustainable will be a smaller, triangular subset of the Full Capture region.

Figure 1 demonstrates that the range of parameter values for which Hounding is sustainable and Full Capture is not can be significant. Although this observation results from an extremely stylised model we argue that it gives an intuitive explanation for why the Media might turn on unpopular governments: recognising that the greater incentive to defect in low popularity periods prohibits collusion in all time periods, they instead coordinate on an equilibrium in which they cooperate while the Politician is popular, but not thereafter.

5 Discussion

Obtaining closed-form results means using an extremely parsimonious model. We now discuss which assumptions are essential for the results and which are used to simplify the exposition. We also discuss the scope for extending the model to answer different questions and deliver more testable predictions.

The assumption that the level of popularity takes only two values and is $i.i.d$ across time periods is used extensively to calculate critical values. In reality there are many degrees of popularity and popularity itself is persistent. This could be incorporated by having popularity follow a finite state Markov process. We could then generalise the hounding concept to include threshold effects: transfers and suppression of stories could occur in high popularity states, but there would be some critical level of popularity below which the Media would turn on the Politician.

However, introducing persistence would only strengthen the results while adding unnecessary algebraic complication. If an unpopular politician were likely to remain unpopular in future periods the incentive for the Media to publish damaging stories would be strengthened because the expected duration of the Politician's time in power following a breakdown in cooperation would be reduced. Similarly cooperation would be made easier to sustain in high popularity periods because the cost of reduced cooperation would be increased. Introducing persistence would also make the Hounding equilibrium easier to sustain because the expected length of time until a low popularity period occurred and cooperation broke down would be increased.

We also restrict the Politician to either making the transfer or not, with the value of the transfer an exogenous parameter of the model. This could be relaxed by making the level of transfers a continuous choice variable. We would then be able to make predictions abouts the dynamics of transfers from government to the media. The Politician would have an incentive to choose the transfer each period such that the Media's incentive-compatibility constraint bound with equality. This would not change the existing results: the Media's silence would be more expensive to buy in low popularity periods, this, combined with the existing effects in the model would increase the Politician's incentive to withdraw transfers when he was unpopular.

Of more concern is the sensitivity of the results to the reelection probabilities specified in equation (3.4). What if the Media's effect on the Politician's reelection probability was given by an arbitrary function $q : (0, 1] \to (0, 1)$? The

answer is that the Media's incentives remain unchanged provided $q(p) < q(1)$, i.e. as long as we make the reasonable assumption that an unpopular government under media attack is less likely to be reelected than a popular government under media attack. This can be seen by deriving the Media's incentive compatibility constraints as:

$$\begin{aligned} \beta q(p)\left[W^M[N] - W^M[Y]\right] &\geq M \text{ for } S = L \\ \beta q(1)\left[W^M[N] - W^M[Y]\right] &\geq M \text{ for } S = H \end{aligned}$$

Clearly the first constraint represents a stricter constraint than the second and so cooperation will be harder to sustain in low popularity periods. However, ensuring that the Politician has a greater incentive to defect in low popularity periods requires an additional restriction on the shape of $q(.)$. Re-deriving equations (4.5) and (4.6) using the generalised reelection probabilities gives:

$$\begin{aligned} \beta\left[pW^P[N] - q(p)W^P[Y]\right] &\geq A \text{ for } S = L \\ \beta\left[W^P[N] - q(1)W^P[Y]\right] &\geq A \text{ for } S = H \end{aligned}$$

The constraint in the low state will be tighter (and hence the Politician's cooperation will be harder to sustain in low popularity periods) if:

$$\frac{W^P[N]}{W^P[Y]} > \frac{q(1) - q(p)}{1 - p}$$

Intuitively we require that the Media can make a sufficient impact on the reelection chances of the popular politician, i.e. that $q(1)$ is sufficiently small. Because $W^P[N] \geq W^P[Y]$, a sufficient condition is that the slope of the line joining $(p, q(p))$ and $(1, q(1))$ is positive and less than 1. Provided that $q(.)$ satisfies this assumption the results of Proposition 1 will follow and a similar parameter restriction relating θ to p will deliver Proposition 4. We assume multiplicative reelection probabilities because this formulation simplifies the critical values and allows q to be interpreted as a measure of media power.

Another extension would be to relax the clean slate assumption while allowing Politicians to return to power. If Politicians could return to office with some probability then their threat to reduce cooperation not only during their current term, but also once they returned to power, could prevent the Media from publishing today. The empirical implication would be that Party based systems, which have a higher probability of the same Politician returning to office, would have less aggressive Media sectors than candidate based systems.

Our current model cannot answer questions about the welfare implications of different levels of Media capture. Addressing this would require defining precisely what the Media reports represent and endogenising the reelection probabilities. If the Media reports are vital information about government policy then we would expect the One Shot Nash to be optimal for voters. However, if they simply represent the Media exploiting its position to make unwarranted attacks on otherwise competent governments it may be that reducing equilibrium reporting could be welfare enhancing.

6 Empirics

Our model gives a theoretical justification for the belief that the media turns on unpopular governments. We now test this prediction by looking for a negative causal effect of government popularity on the volume of negative media reporting. To do this we first require a measure of government popularity. The obvious choice in an historically two-party system like the UK, is the incumbent party's poll lead over the main opposition party. Secondly, we need a way of measuring the level of negative media reporting.

To construct such a measure we adapt the approach of Puglisi and Snyder (2010) and examine the level of newspaper coverage given to political "scandals".[9] We conducted key word searches that counted the number of articles each newspaper published about a number of corruption investigations into UK government MPs. Our dependent variable is then, depending on the estimation method used, the number of hits or its logarithm. We now discuss the data and our empirical strategy in detail before presenting our results

Data

We are interested in the causal effect of an incumbent party's poll lead on the level of newspaper coverage of "scandals" affecting government MPs. Because poll leads vary over time, we need to be more aware of selection effects when choosing our initial list of scandals, than studies which are interested in the effect of factors, such as newspaper ideology, which are likely to be relatively stable over time. Creating an arbitrary list of scandals from memory would be unsatisfactory because the further back in time we went, the more likely that only the most high profile scandals would be included. This would create a selection effect over time that might be erroneously attributed to changes in government popularity.

Our solution is to use a fixed inclusion rule: our list of "scandals" consists of all official investigations by the House of Commons' Committee for Standards and Privileges into government MPs between April 1992 and May 2010. The final list covers four full parliamentary terms with one term of Conservative government (1992-1997) and three of Labour. The Committee's reports are published in the House of Commons papers and are available online. Each report includes details of the accusations, the date they were made, the date the report was published and the Committee's verdict, including whether any additional punishment, such as temporary suspension from the House of Commons, was recommended.

With the list of scandals established, we constructed time windows within which to conduct our keyword searches: these cover the period from the first

[9] They provided econometric evidence of a relationship between US newspapers' ideology and the relative amount of coverage they devoted to scandals involving Democratic and Republican politicians. Their dependent variable was constructed by using keyword searches to determine the frequency with which each newspaper covered a list of 35 major political scandals.

day of the month 2 months before the initial accusation until the last day of the month 4 months after the committee issued its report. This is preferred to searching the entire database, firstly because some MPs were investigated more than once and secondly because doing so would inflate the counts for earlier scandals compared to later ones. The size of the window itself is arbitrary, but, because most hits are concentrated around the initial accusation and the publication of the final report, changes to the size of the window do not cause substantial changes to the number of hits.

The variable *hits* was constructed using the Lexis Library's inbuilt search function. We recorded the number of articles in each newspaper during the time window which satisfied the search criteria: {NAME OF MP} AND(SLEAZE* OR ((PRIVILEGES OR STANDARDS) AND COMMITTEE) OR SCANDAL*) where * denotes wildcard searches.

Using a less parsimonious specification for the search would decrease the number of observations with no hits, giving more variation across scandals and newspapers and hence more precise parameter estimates, but comes with increased risk of including non-scandal related stories. One concern is that introducing more generic search terms would disproportionately inflate the counts for more senior politicians who inevitably receive more non-scandal related coverage.

The full sample is an unbalanced panel of 84 investigations across 18 newspapers to give 1230 observations. Data from 11 newspapers is available for the whole list of scandals. We repeated all of our analysis using only this subset of newspapers with no substantive changes to the results.

To construct a measure of the Government's popularity we used the Ipsos Mori monthly voting intention polls. For each investigation the variable *poll lead* is the average of the incumbent party's lead over its main rival for all polls conducted during the scandal's time window. Each month's poll data was given equal weight and in cases where multiple polls occurred in a single month the weight for that month was equally divided between them. We experimented with using alternative timings such as the poll lead on the date of accusation or the date of the Committee's final report, but found that this made little difference.

As well as the Government's poll lead the remaining time until the next election might be a factor in the strategic thinking of newspapers: it may not be wise to anger even an unpopular government if they have several years left in office. One quirk of the British political system is that there is no set date on which elections have to occur. As a result the variable *time to election* measures the time in years until the ex-post realisation of the subsequent election date. This value may not correspond exactly to the time that was expected by newspapers ex-ante, but seems the most logical choice.

We also control for the profile of the MP being accused and the severity of the offence he or she was judged to have committed with a set of dummy variables. The first, *senior,* equals one if the MP in question was a Government Minister, *resigned* applies only to senior individuals and equals one if the minister resigned their post in response to the investigation and *stood down,* which applies to all

investigations and equals one if the MP did not stand for reelection.

We also included dummies that record the committee's verdict: *guilty* equals one if the complaint was upheld, *punished* equals one if the Committee recommended further action such as temporary suspension from the House of Commons, paying back of illegitimate expenses claims or a requirement to issue a written apology to the House. In cases where the accused had left the House of Commons by the time of the report, the reports make clear what action would have been taken if the accused had still been an MP so this does not pose a problem for our analysis.

There are numerous reasons to expect systematic differences in the level of reporting across newspapers. Most obviously newspapers differ in size so one would expect larger newspapers to display more hits. Papers may also differ in the attention they give to political stories or in their ideological position. We control for these factors by introducing newspaper fixed effects where possible. Because there are multiple investigations each year we are also able to include year dummies in some of our specifications, these are designed to control for unobserved differences across time that could have influenced the level of newspaper reporting.

Empirical Approach

Our estimation strategy draws from the large literature on count data econometrics. Our first estimation technique is the log linear model of Hausman, Hall, and Griliches (1984). We replaced all zero counts with ones and then used *log hits* as our dependent variable. This can then be regressed on a linear specification which, includes a dummy variable *zero* that equals one for all zero counts. Indexing newspapers by j and investigations by i the equation of interest is:

$$\begin{aligned} E\left[\log \text{hits}_{ij} \mid X_{ij}, p_{ij}, \eta_j\right] &= \alpha + \delta \text{polllead}_{ij} + \text{zero}_{ij}\theta + X_{ij}\beta + \eta_j \\ \log \text{ hits}_{ij} &= \alpha + \delta \text{pollead}_{ij} + \text{zero}_{ij}\theta + X_{ij}\beta + \eta_j + \varepsilon_{ij} \end{aligned}$$

Where η_j is a newspaper fixed effect and X_{ij} is the set of controls outlined above, which may contain a set of year dummies. Because of the log dependent variable the coefficient on *poll lead* is a semi-elasticity i.e. it gives the percentage change in the number of hits resulting from a unit increase in *poll lead*. If we are correct that *poll lead* is endogenous then OLS will deliver inconsistent estimates of δ. The problem then becomes one of finding instruments correlated with the incumbent's poll lead, but uncorrelated with unobserved determinants of the Media's reporting of scandals.

We instrument for *poll lead* using average unemployment, as measured by the claimant count and inflation in each investigation's time window. An extensive literature on popularity functions (e.g. Kramer (1971); Alesina and Rosenthal (1995); Nannestad and Paldam (1994)) show them to be strongly correlated with government poll leads. The exclusion restriction for IV to be consistent is that these factors have no effect on the level of reporting except through their effect on government popularity.

This restriction can be separated into three stages: we require that neither MPs' behaviour, the committee's decision to investigate nor the Media's propensity to cover an ongoing investigation depended on unemployment or inflation except through their effect on government popularity. We argue that there is no a priori reason for these three assumptions to fail. As a robustness check we looked for any systematic variation over time in the number of corruption investigations. We found the number of investigations each year to be remarkably stable with the exception of the year 1997 in which a large number of backdated reports were published simultaneously. We included year dummies in some of our specifications to control for any additional sources of endogeneity. A related concern is that there could be a common trend between these economic variables and unobserved determinants of media reporting over time. Again this is controlled for with the inclusion of year dummies. Because we have more instruments than endogenous regressors we can also indirectly test the exogeneity assumption using overidentification tests.

As well as the log-linear specification which can be estimated using standard instrumental variable techniques we also estimate a nonlinear model with *hits* as the dependent variable. The conditional mean is modelled as exponential and we assume an additive error term. Again δ is a semi-elasticity, allowing for easy comparison with the log-linear specification[10]:

$$\begin{aligned} E\left[\text{hits}_{ij} \mid X_{ij}, p_{ij}\right] &= \exp\left(\alpha + \delta \text{pollead}_{ij} + X_{ij}\beta\right) = \mu_{ij} \\ \text{hits}_{ij} &= \mu_{ij} + \varepsilon_{ij} \end{aligned}$$

Estimation is conducted using GMM where the moment condition is that the instruments, z_{ij}, are orthogonal to the error term:

$$E\left(\varepsilon_{ij} \mid z_{ij}\right) = E\left(\left(\text{hits}_{ij} - \mu_{ij}\right) \mid z_{ij}\right) = 0 \tag{6.1}$$

We also estimated an alternative GMM estimator based on a model with multiplicative error term as proposed by Mullahy (1997). The results were virtually identical, except that the estimates with multiplicative error failed the Hansen J test. This is consistent with the theoretical result (see Windmeijer (2006)) that, in general, no set of instruments can satisfy both the additive and multiplicative moment conditions. Overidentification tests can therefore be interpreted as a joint test of model specification and the exogeneity of the instruments. With this caveat we now turn to our results.

Results

We first report results from the log-linear model, before turning to the GMM estimates of the nonlinear model. We find that the estimated coefficients on *poll lead* are negative, matching the prediction of our model and are stable

[10] Of course, strictly speaking, the parameters are not directly comparable as $E[\log(X)] \neq log[E(x)]$

across specifications. We then go on to test whether the negative relationship between popularity and newspaper coverage is affected by newspaper ideology or proximity to an election.

OLS and IV Estimates of the Log-Linear Model

Turning to the OLS results in Table 1 we see that the point estimates on *poll lead*, whether or not we control for unobserved heterogeneity across years, is negative and statistically significant at the 10% level. However, the magnitude of the coefficient is economically trivial: it implies that a one percentage fall in poll lead will result in a .5% fall in the number of newspaper reports. Even a two standard deviation fall in the incumbent's poll lead will result in an increase of reporting of just 18%.

We now turn to the IV estimates, also in Table 1. Assessing the instruments for relevance and validity we find that *inflation* and *claimant count* are both highly significant in the first stage regression. Their partial R^2 is .80, falling to .65 upon inclusion of the year dummies. Because we have more instruments than endogenous regressors we test the exogeneity of the instruments using the Hansen J statistic. We find that the null of exogeneity is rejected at the 37% level, rising to 38% upon inclusion of the year dummies. However, the fact that both our instruments are based on the same rationale: that economic conditions are exogenous to the media's publishing decision, means that the failure to reject the null is not particularly informative.

The IV estimates on *poll lead* are larger in absolute value and are highly significant. Including the year dummies, which should further reduce the endogeneity problem, causes the estimated coefficient on *poll lead* to become more negative. The implication is that the OLS estimates are biased *towards* zero. The IV estimate when year dummies are included is -0.025 with a confidence interval of $[-0.033, -0.017]$. This implies that a one standard deviation (18 percentage point) fall in *poll lead*, will result in an investigation receiving between 30 and 60 percent more coverage than it otherwise would have.

The fact that instrumenting for *poll lead* and introducing the year dummies increases the absolute value of the coefficient is indicative of the OLS estimates being biased towards zero. This suggests that the two most obvious sources of endogeneity: reverse causality and omission of measures of government quality are being outweighed by measurement error in *poll lead*. Given that poll numbers are reported with a substantial margin of error this is not surprising. However, the important implication is that our results are, if anything, understating the effect of government popularity on media coverage.

Turning to the set of control variables we find, with some surprise, that *guilty* is significant in only one of the second stage regressions and sometimes enters with negative sign. The most likely cause is the lack of variation in the sample: around 75% of investigations resulted in a guilty verdict so it is a poor measure of the seriousness of the offenses being committed. The coefficient on *punished*, which applies to only 40% of observations and is probably a better measure of the seriousness of each allegation, does match our prior: MPs who

Table 1: OLS and IV Estimates of Log Linear Specification

	(1) log hits	(2) log hits	(3) poll lead	(4) log hits	(5) poll lead	(6) log hits
poll lead	-0.0053*	-0.0054*	-	-0.0097***	-	-0.0251***
	(0.0026)	(0.0029)		(0.0027)		(0.0042)
claimant count	-	-	-0.0345***	-	-0.0440***	-
			(0.0004)		(0.0018)	
inflation	-	-	-14.9016***	-	-10.0530***	-
			(0.5449)		(0.4234)	
senior	0.8852***	0.9802***	1.7552***	0.9148***	-0.3093**	0.9889***
	(0.0900)	(0.1133)	(0.3810)	(0.0872)	(0.1383)	(0.1075)
guilty	-0.0502	0.0439	4.4365***	-0.0160	2.1808***	0.0989**
	(0.0647)	(0.0461)	(0.2662)	(0.0620)	(0.0732)	(0.0448)
punished	0.2959***	0.1432	-0.4907**	0.2666***	1.8697***	0.1915**
	(0.0680)	(0.0917)	(0.2054)	(0.0639)	(0.0601)	(0.0877)
resigned	0.3972***	0.4426***	-1.9589***	0.4207***	-3.9811***	0.4091***
	(0.0877)	(0.0848)	(0.1713)	(0.0837)	(0.0612)	(0.0809)
stooddown	-0.0808	-0.0177	1.2798***	-0.1255*	0.1690	-0.0390
	(0.0698)	(0.0676)	(0.1770)	(0.0659)	(0.1425)	(0.0645)
time to election	-0.0115	0.0047	1.7276***	-0.0214	5.6194***	0.0362
	(0.0199)	(0.0288)	(0.2145)	(0.0195)	(0.2666)	(0.0272)
zero	-1.3494***	-1.0421***	-4.0632***	-1.3277***	0.7236**	-1.0169***
	(0.1251)	(0.0967)	(0.6616)	(0.1214)	(0.2745)	(0.0911)
Year Dummies	No	Yes	No	No	Yes	Yes
N	1230	1230	1230	1230	1230	1230
R^2	0.61	0.66	0.85	0.53	0.98	0.44
F	62.20	53.85	62.20	33.91	1026.11	30.14
Hansen J (p-value)	-	-	-	0.37	-	0.38

i) Standard errors, clustered by newspaper, in parentheses

ii) Specifications (1) and (2) estimated by OLS, (4) and (6) by IV. Equations (3) and (5)are the first stage regressions for (4) and (6) respectively

iii) All specifications include paper dummies

iv) * p<0.10, ** p<0.05, *** p<0.01

received an official punishment got between 14 and 30 percent more coverage and the coefficient is significant in all but one specification. The final control for the seriousness of the allegations, *stooddown*, is not significant in any of our specifications. This probably results from the fact that MPs may choose to retire for any number of reasons, such as age or ill health, unrelated to their investigation by the Committee.

The last two control dummies *senior* and *resigned* are included to control for the profile of the individual being investigated. Their coefficients are as expected and remarkably stable across specifications: investigations involving government ministers can expect to receive roughly twice as much newspaper coverage, all else being equal, as those involving backbench MPs. When *resigned* is equal to one and the investigation lead to the minister in question losing their ministerial position (as occurred for a third of ministers in the sample) then newspaper coverage increases by an additional 40%.

GMM Estimation of the Nonlinear Model

We now turn to Table 2 which presents the results from GMM estimation of the exponential conditional mean using the moment conditions in equation (6.1). Encouragingly the results are qualitatively identical and quantitatively similar to those in the previous section.

One drawback of nonlinear methods is that their computational complexity means we cannot estimate as many parameters and in particular we cannot directly estimate the fixed effects. The normal solution in panel count models is to conduct within group mean scaling transformation to remove the fixed effects (Hausman, Hall, and Griliches (1984)). However, this is complicated by the presence of an endogenous regressor.

While estimating the transformed model by GMM is valid under additional parametric assumptions we instead control directly for heterogeneity across newspapers by introducing the additional control variables *tabloid*, a dummy equalling one if the newspaper is a tabloid, *daily* which equals one if the newspaper is published Monday to Friday and *circulation* which gives the newspaper's average circulation during the time window.[11] The point estimates on *poll lead,* at between 1.5% and 2.5%, are almost identical to the log-linear case. Senior MPs can expect to receive more than twice as much coverage as backbenchers, as can MPs who were given an official punishment by the committee. The specifications with additive error pass the Hansen J test.

In conclusion, the results in Tables 1 and 2 represent consistent evidence of a negative relationship between government popularity and the level of media coverage of political scandals. This is consistent with the predictions of our stylised theoretical model and independent of the estimation approach used.

[11]The monthly circulation data was obtained from the Audit Bureau of Circulation. When data was unavailable linear interpolation was used to compute the missing values.

Table 2: Count GMM with Additive Error

	(1) hits	(2) hits	(3) hits
poll lead	-0.0072	-0.0195***	-0.0132***
	(0.0053)	(0.0059)	(0.0049)
time to election	0.0550	0.0413	0.0127
	(0.0398)	(0.0368)	(0.0383)
guilty	-0.2586***	-0.0510	-0.0134
	(0.0937)	(0.0819)	(0.0887)
punished	0.4817***	0.3238***	0.3716***
	(0.0327)	(0.0392)	(0.0347)
stooddown	-0.3022***	-0.4623***	-0.3057***
	(0.1043)	(0.1080)	(0.0659)
senior	1.6016***	1.6799***	1.7281***
	(0.0761)	(0.0735)	(0.0759)
resigned	0.2779***	0.3470***	0.2078***
	(0.1025)	(0.0934)	(0.0664)
daily	0.9112***	0.9054***	0.8330***
	(0.1582)	(0.1543)	(0.1645)
circulation	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
tabloid	-0.5335	-0.5021	-0.5454
	(0.3919)	(0.4006)	(0.4047)
constant	0.5563***	0.4312**	0.3749*
	(0.1842)	(0.1752)	(0.1921)
N	1230	1230	1230
Hansen J (p-value)	-	-	0.06

i) Standard errors in parenthesis and allow for clustering by newspaper

ii) Specifications (1) treats poll lead as exogenous

iii) Specification (2) instruments for poll lead with claimant count

iv) Specification (3) instruments with ccount and inflation

v) * p<0.10, ** p<0.05, *** p<0.01

Ideological Effects?

Having found a negative effect of government popularity on media coverage we now examine whether this effect differs systematically with newspaper ideology. We do this by partitioning the newspapers in the sample into three categories: left-wing, right-wing and centrist. The inevitable reduction in sample size makes estimating the nonlinear models infeasible, so we use the log-linear specification.

To conduct the partition we need to construct a measure of ideology. We do this by estimating a linear probability model of electoral endorsements on a panel of UK general elections since 1979[12]. The dependent variable is an indicator that equals one if paper j endorsed the Conservative party in election i. We control for each paper's average circulation during the election year, whether the Conservatives were the incumbent and whether they went on to win the election:

$$\text{endorse}_{ij} = \alpha + \mu_j + \text{circulation}_{ij}\beta_1 + \text{incumbent}_i\beta_2 + \text{winner}_i\beta_3 + \xi_{ij}$$

The newspaper fixed effects are a measure of each newspaper's idiosyncratic slant in favour or against the Conservative party. The resulting ideological ranking is consistent with intuition and is naturally separated into three groups. To examine whether the popularity effect differs systematically across these three groups we restrict our sample to the years of Labour government. Because a greater proportion of the left-wing papers have data available for the entire sample we restrict our estimations to investigations after 2000 where data is available for all 18 newspapers so as to ensure that differences in the estimated coefficients are not due to different sampling periods. Qualitatively identical results are obtained when the whole Labour period is used. Unfortunately we cannot repeat the analysis for the Conservative years in office as there are too few observations for centrist and right wing newspapers to make the comparison worthwhile.

Table 3: Partitioned Regression by Ideology

	Left-Wing	Centrist	Right-Wing
poll lead	-0.0136	-0.0474***	-0.0573***
	(0.0133)	(0.0087)	(0.0050)
N	266	151	253

* p<0.10, ** p<0.05, *** p<0.01

Intuition would suggest that the popularity effect should be stronger for centrist and right-wing newspapers than for left-wing ones: left-wing newspapers might be loath to publish stories that could lead to the Conservative party returning to power while more right-wing newspapers might abandon Labour more readily. As can be seen in Table 4 this intuition carries through to our results: the centrist and right-wing newspapers have coefficients twice as large as

[12]This approach is similar to that used by Puglisi and Snyder (2010)

those in the baseline specification and the coefficient for left-wing papers is not significantly different from zero. The implication is that the popularity effect is amplified by ideological considerations. In terms of the model this could be explained by making the Media's valuation of the transfer dependent on its ideological closeness to the Politician. Ideologically sympathetic newspapers would then be able to sustain the collusive agreement at lower levels of popularity.

Electoral Effects?

If the negative relationship between government popularity and media reporting results from strategic considerations one might expect the effect to be larger in election years. To test this hypothesis we interact *poll lead* with a dummy equalling one if the next election occurred within a year of the start of the investigation. One would expect the coefficient on this interaction to be negative, indicating that the popularity effect increases close to an election. Table 4 gives the results when an interaction term is included in the log-linear specification and the interaction of the claimant count and the election year dummy is used as an additional instrument. One major problem is the lack of variation in the sample: only 7 of the investigations occurred within a year of an election, hence our results may be dominated by randomness in the newsworthiness of these investigations.

Perhaps for this reason the results are ambiguous: in the specifications estimated by OLS the interaction term is negative, but insignificant. When we estimate by IV the estimate is positive and significant in the specification without year dummies and negative when they are included. One explanation could be that including year dummies controls for unobserved heterogeneity over time, allowing us to isolate the true strategic effect. However, the results remain far from conclusive.

Table 4: Estimates With Election Year Interaction

	(1)	(2)	(3)	(4)
	log hits	log hits	log hits	log hits
poll lead	-0.0053*	-0.0064**	-0.0119***	-0.0366***
	(0.0026)	(0.0030)	(0.0031)	(0.0052)
poll lead x election year	-0.0001	-0.0060	0.0142**	-0.0497***
	(0.0036)	(0.0045)	(0.0063)	(0.0117)
Year Dummies	No	Yes	No	Yes

i) Standard errors, clustered by newspaper, in parentheses

ii) Specifications (1) and (2) estimated by OLS, (3) and (4) by IV.

iii) Control variables are as in Table 1

iv) * p<0.10, ** p<0.05, *** p<0.01

In conclusion, we have uncovered a causal effect of government popularity on

media coverage of corruption investigations that is consistent with our stylised theoretical model. Unfortunately the issue of observational equivalence remains. For example, the same effect might exist if consumers derive utility from reading negative stories about a government they already dislike, inducing newspapers to publish more negative stories about unpopular governments. Although there is some evidence of electoral effects consistent with our strategic explanation, more work and better data is needed to work out what proportion of the observed relationship can be attributed to other mechanisms.

7 Conclusion

In this paper we have provided an explanation for why the media might turn on unpopular governments. Unpopular governments find it harder to maintain collusive agreements with the media because the fact that they are less likely to remain in office means they cannot commit to punishment in future periods. This gives the media an incentive to cover-up the indiscretions of popular governments, but hound unpopular ones from office.

Having formalised the channel by which popularity might affect media reporting we then examined whether such an effect was present in the data. We found robust evidence of a negative relationship between government popularity and media coverage of UK corruption investigations. The paper therefore delivers an intuitive theoretical explanation and formal econometric evidence for a previously unstudied phenomenon and adds to the list of factors that help determine the sustainability of collusive arrangements between media and government.

References

Alesina, A., and H. Rosenthal (1995): *Partisan Politics, Divided Government and the Economy*. Cambridge University Press.

Baron, D. P. (2006): "Persistent media bias," *Journal of Public Economics*, 90(1-2), 1–36.

Bernhardt, D., S. Krasa, and M. Polborn (2008): "Political polarization and the electoral effects of media bias," *Journal of Public Economics*, 92(5-6), 1092–1104.

Besley, T., and R. Burgess (2002): "The Political Economy Of Government Responsiveness: Theory And Evidence From India," *The Quarterly Journal of Economics*, 117(4), 1415–1451.

Besley, T., and A. Prat (2006): "Handcuffs for the Grabbing Hand? Media Capture and Government Accountability," *American Economic Review*, 96(3), 720–736.

Blundell, R., R. Griffith, and J. V. Reenen (1999): "Market Share, Market Value and Innovation in a Panel of British Manufacturing Firms," *The Review of Economic Studies*, 66(3), pp. 529–554.

DellaVigna, S., and E. Kaplan (2007): "The Fox News Effect: Media Bias and Voting," *The Quarterly Journal of Economics*, 122(3), 1187–1234.

Djankov, S., and et al (2003): "Who Owns the Media?," *Journal of Law & Economics*, 46(2), 341–81.

Fudenberg, D., and J. Tirole (1991): *Game Theory*. MIT Press.

Gentzkow, M., E. L. Glaeser, and C. Goldin (2004): "The Rise of the Fourth Estate: How Newspapers Became Informative and Why It Mattered," (10791).

Gentzkow, M., and J. M. Shapiro (2006): "Media Bias and Reputation," *Journal of Political Economy*, 114(2), 280–316.

Groseclose, T., and J. Milyo (2005): "A Measure of Media Bias," *The Quarterly Journal of Economics*, 120(4), 1191–1237.

Hausman, J., B. H. Hall, and Z. Griliches (1984): "Econometric Models for Count Data with an Application to the Patents-R&D Relationship," *Econometrica*, 52(4), 909–38.

Kramer, G. H. (1971): "Short-Term Fluctuations in U.S. Voting Behavior, 1896-1964," *The American Political Science Review*, 65(1), pp. 131–143.

Lim, C., J. M. Snyder, and D. Stromberg (2010): "Measuring Media Influence on U.S. State Courts," *Working Paper*.

McMillan, J., and P. Zoido (2004): "How to Subvert Democracy: Montesinos in Peru," *Journal of Economic Perspectives*, 18(4), 69–92.

Mullahy, J. (1997): "Instrumental-Variable Estimation Of Count Data Models: Applications To Models Of Cigarette Smoking Behavior," *The Review of Economics and Statistics*, 79(4), 586–593.

Mullainathan, S., and A. Shleifer (2005): "The Market for News," *American Economic Review*, 95(4), 1031–1053.

Nannestad, P., and M. Paldam (1994): "The VP-Function: A Survey of the Literature on Vote and Popularity Functions after 25 Years," *Public Choice*, 79(3-4), 213–45.

Prat, A., and D. Strömberg (2005): "Commercial Television and Voter Information," *CEPR Discussion Papers*.

Puglisi, R. (2006): "Being The New York Times: The Political Behaviour Of A Newspaper," *STICERD Working Paper*.

Puglisi, R., and J. M. Snyder (2010): "Media Coverage of Political Scandals," *NBER Working Paper*.

Snyder, J. M. (1990): "Campaign Contributions as Investments: The U.S. House of Representatives, 1980-1986," *Journal of Political Economy*, 98(6), 1195–1227.

Snyder, J. M., and D. Stromberg (2008): "Press Coverage and Politican Accountability," *Working Paper*.

Stromberg, D. (2001): "Mass media and public policy," *European Economic Review*, 45(4-6), 652–663.

Stromberg, D., and A. Prat (2010): "Commercian Television and Voter Information," *Working Paper*.

Strömberg, D. (2004): "Radio's Impact on Public Spending," *The Quarterly Journal of Economics*, 119(1), 189–221.

Windmeijer, F. (2006): "GMM for Panel Count Data Models," *CeMMAP Working Paper*.

Appendix

Derivation of Equilibrium Conditions for Full Capture and Proof of Proposition 1

Before proving the proposition we introduce two additional pieces of notation: $W^i\left[\tilde{H},S\right]$ is player i's continuation value given history $\tilde{H}$ after all actions have occurred but before the election has taken place. Because reelection probabilities depend on popularity it is a function of S. Secondly $W^P[O]=0$ is the Politician's continuation value if he loses the election, it is normalised to zero.

The Media: In state (L,N) the Politician's strategy specifies that $\varsigma=1$. The Media chooses $\gamma=0$ so we can use (3.2) and (3.4) to find the value function as:

$$\begin{aligned} V^M[L,N,\gamma=0] &= \tau A+\beta W^m[N,L] \\ &= \tau A+\beta\left[pW^M[N]+(1-p)W^M[N]\right] \\ &= \tau A+\beta W^M[N] \end{aligned} \tag{7.1}$$

If instead it chooses $\gamma=1$ then it receives additional revenue M, but the history changes to Y to give:

$$\begin{aligned} V^M[L,N,\gamma=1] &= \tau A+M+\beta W^m[Y,L] \\ &= \tau A+M+\beta\left[pqW^M[Y]+(1-pq)W^M[N]\right] \end{aligned} \tag{7.2}$$

Where we use the fact that when the incumbent loses the election, cooperation will resume and $\tilde{H}$ will revert to N. Setting $p = 1$ in (7.1) and (7.2) gives the equivalent value functions for state (H, N):

$$\begin{aligned} V^M[H, N, \gamma = 0] &= \tau A + \beta W^M[N] \\ V^M[H, N, \gamma = 1] &= \tau A + M + \beta\left[qW^M[Y] + (1-q)W^M[N]\right] \end{aligned}$$

Once $\tilde{H}_t = Y$, play reverts to the One Shot Nash. Using this with (3.2) and (3.4) gives:

$$\begin{aligned} V^M[L, Y] &= M + \beta W^M[L, Y] \\ &= M + \beta\left[pqW^M[Y] + (1-pq)W^M[N]\right] \qquad (7.3) \\ V^M[H, Y] &= M + \beta W^M[H, Y] \\ &= M + \beta\left[qW^M[Y] + (1-q)W^M[N]\right] \qquad (7.4) \end{aligned}$$

Where, once again the payoff-relevant history reverts to N as soon as the incumbent loses the election. Substituting (7.1) and (7.2) into the incentive compatibility conditions into (4.1) for S equal to L and H gives:

$$\begin{aligned} \beta pq\left[W^M[N] - W^M[Y]\right] &\geq M \; S = L \qquad (7.5) \\ \beta q\left[W^M[N] - W^M[Y]\right] &\geq M \; S = H \qquad (7.6) \end{aligned}$$

Because $p < 1$ and $W^M(N) \geq W^M[N]$ (7.6) will hold if and only if (7.5) is satisfied.

The Politician: In state (L, N) if the Politician sets $\varsigma = 1$, then the Media will set $\gamma = 0$ and we can use equations (3.1) and (3.4) along with the assumption that $W^P[O] = 0$ to give:

$$\begin{aligned} V^P[L, N, \varsigma = 1] &= R - A + \beta W^P[N, L] \\ &= R - A + \beta\left[pW^P[N] + (1-p)W^P[O]\right] \qquad (7.7) \\ &= R - A + \beta pW^P[N] \qquad (7.8) \end{aligned}$$

If he chooses $\varsigma = 0$ his per period utility increases by A, but the history immediately changes to Y and the Media will publish, reducing his election probability to pq:

$$\begin{aligned} V^P[L, N, \varsigma = 0] &= R + \beta W^P[Y, L] = R + \beta\left[pqW^P[Y] + (1-pq)W^P[O]\right] \\ &= R + \beta pqW[Y] \qquad (7.9) \end{aligned}$$

The corresponding value functions for (H, N) can be found by setting $p = 1$:

$$V^P[H,N,\varsigma=1] = R-A+\beta[W[N]] \quad (7.10)$$
$$V^P[H,N,\varsigma=0] = R+\beta qW^P[Y] \quad (7.11)$$

Once $\tilde{H}_t = Y$, play reverts to the one-shot Nash. Using equation (3.1) with $\varsigma = 0$ and the reelection probabilities with $\gamma = 1$ gives the continuation values as:

$$V^P[L,Y] = R+\beta W^P[L,Y] = R+\beta pqW^P[Y]$$
$$V^P[H,Y] = R+\beta qW^P[Y]$$

Substituting (7.7), (7.9), (7.10) and (7.11) into (4.4) gives the conditions:

$$\beta p\left[W^P[N]-qW^P[Y]\right] \geq A\ S=L \quad (7.12)$$
$$\beta\left[W^P[N]-qW^P[Y]\right] \geq A\ S=H \quad (7.13)$$

Where again, because $p<1$, (7.13) will hold if and only if (7.12) is satisfied. Because the incentive compatability constraints for each player are tigter when the Politician's popularity is low it follows that cooperation is more difficult to sustain in low popularity periods.

Proof of Proposition 2

The Media: Using the assumption that the state is *i.i.d* each period allows us to rewrite the post election continuation values in terms of the value functions derived in the proof of Proposition 1:

$$W^M[Y] = \theta V^M[H,Y]+(1-\theta)V^M[L,Y] \quad (7.14)$$
$$W^M[N] = \theta V^M[H,N,\gamma=0]+(1-\theta)V^M[L,N,\gamma=0] \quad (7.15)$$

Substituting in the relevant value functions from the proof of Proposition 1 gives:

$$W^M[Y] = \frac{M}{1-\beta q[\theta+(1-\theta)p]}+\beta\frac{\theta(1-q)+(1-\theta)(1-pq)}{1-\beta q[\theta+(1-\theta)p]}W^M[N]$$
$$W^M[N] = \frac{\tau A}{1-\beta}$$

Solving the incentive compatibility constraints (7.5) and (7.6) at equality gives the critical levels of transfers as stated in the proposition. For the second part of the proposition rearranging $A_L^* \geq A_H^*$gives the condition $(1-p)[1-\beta q[\theta+(1-\theta)p]] \geq 0$ which, given that $\beta, q, p, \theta \in (0,1)$, will always hold

The Politician: We again rewrite the post election continuation values in terms of the value functions derived in Proposition 3:

$$\begin{aligned} W^P[Y] &= \theta V^P[H,Y] + (1-\theta)V^P[L,Y] \\ W^P[N] &= \theta V^P[H,N,\varsigma=0] + (1-\theta)V^P[L,N,\varsigma=0] \end{aligned}$$

Substituting in the relevant value functions gives the post election continuation values as:

$$W^P[Y] = \frac{R}{1-\beta q[\theta+(1-\theta)p]} \quad W^P[N] = \frac{R-A}{1-\beta[\theta+(1-\theta)p]}$$

Solving the incentive compatibility constraints, (7.12) and (7.13), at equality gives the critical values of ego rents in the proposition. To show that $R_L^* \geq R_H^*$we substitute in the critical values to give the condition:

$$\frac{1-\beta\theta(1-p)}{p} \geq 1+\beta-\beta[\theta+(1-\theta)p]$$

The right-hand side of this inequality can be rewritten as:

$$\frac{1-\beta\theta(1-p)}{p} - (1-p)\frac{1-\beta[\theta+(1-\theta)p]}{p}$$

As this is the left-hand side of the inequality minus a positive constant the proposition follows.

Proof of Proposition 3

The Media: Using the subscript "Hound" to indicate that all value functions refer to the Hounding outcome and using the new strategy profiles gives the value functions as:

$$\begin{aligned} V^M_{Hound}[H,N,\gamma=0] &= \tau A + \beta W^M_{Hound}[N] \\ V^M_{Hound}[H,N,\gamma=1] &= \tau A + M + \beta\left[qW^M_{Hound}[Y] + (1-q)W^M_{Hound}[N]\right] \\ V^M_{Hound}[L,Y] &= V^M_{Hound}[L,N] = M + \beta\left[pqW^M_{Hound}[Y] + (1-pq)W^M_{Hound}[N]\right] \\ V^M_{Hound}[H,Y] &= M + \beta\left[qW^M_{Hound}[Y] + (1-q)W^M_{Hound}[N]\right] \end{aligned}$$

For Hounding to be an equilibrium the incentive constraint $V^M_{Hound}[H,N,\gamma=0] \geq V^M_{Hound}[H,N,\gamma=1]$, must be satisfied. Substituting in the value functions and rearranging gives:

$$W^M_{Hound}[N] - W^M_{Hound}[Y] \geq \frac{M}{\beta q} \tag{7.16}$$

Using the *i.i.d* nature of the level of popularity to rewrite the post election continuation values in terms of the value functions above gives:

$$
\begin{aligned}
W^M_{Hound}[N] &= \theta\left[\tau A + \beta W^M_{Hound}[N]\right] + \qquad (7.17)\\
&\quad (1-\theta)\left[M + \beta\left[pqW^M_{Hound}[Y] + (1-pq)\,W^M_{Hound}[N]\right]\right]\\
W^M_{Hound}[Y] &= \theta\left[M + \beta\left[qW^P_{Hound}[Y] + (1-q)\,W^P_{Hound}[N]\right]\right]\\
&\quad +(1-\theta)\left[M + \beta pqW^P_{Hound}[Y]\,(1-pq)\,W^P_{Hound}[N]\right] \qquad (7.18)
\end{aligned}
$$

Subtracting (7.18) from (7.17) allows us to solve for $W^M_{Hound}[N] - W^M_{Hound}[Y]$. Substituting this into (7.16) and solving for A gives equation (4.11).

The Politician: Using the new strategy profile and the fact that cooperation breaks down as soon as a low-popularity period occurs gives:

$$
\begin{aligned}
V^P_{Hound}[H, N, \varsigma = 1] &= R - A + \beta_{Hound} W^P[N]\\
V^P_{Hound}[H, N, \varsigma = 0] &= R + \beta q W^P_{Hound}[Y]\\
V^P_{Hound}[H, Y] &= R + \beta q W^P_{Hound}[Y]\\
V^P_{Hound}[L, Y] &= V^P_{Hound}[L, N] = R + \beta W^P_{Hound}[Y, H]
\end{aligned}
$$

For Hounding to be an equilibrium the incentive constraint $V^P_{Hound}[H, N, \varsigma = 1] \geq V^M_{Hound}[H, N, \varsigma = 0]$, must hold. Substituting in the value functions and rearranging gives the condition:

$$
\beta\left[W^P_{Hound}[N] - qW^P_{Hound}[Y]\right] \geq A \qquad (7.19)
$$

Again using the *i.i.d* nature of the level of popularity gives the post-election continuation values as:

$$
\begin{aligned}
W^P_{Hound}[N] &= \theta\left[R - A + \beta W^P_{Hound}[N]\right] + (1-\theta)\left[R + \beta pqW^P_{Hound}[Y]\right]\\
W^P_{Hound}[Y] &= \theta\left[R + \beta qW^P_{Hound}[Y]\right] + (1-\theta)\left[R + \beta pqW^P_{Hound}[Y]\right]
\end{aligned}
$$

Solving for the post election continuation values $W^P_{Hound}[Y]$ and $W^P_{Hound}[N]$ allows us to solve (7.19) at equality for the critical level of the transfer, A^*_{Hound} as in the proposition.

Proof of Proposition 4

We wish to show that there are values of R and A such that both are high enough to sustain the Hounding Equilibrium, but that at least one is too low to sustain the Full Capture Equilibrium i.e. that the set:

$$
Q = \{R, A \,:\, R^*_{hound} \leq R, A^*_{Hound} \leq A, A < \max\{A^*_L, A^*_H\} \text{ or } R < \max\{R^*_L, R^*_H\}\}
$$

is non empty. From Proposition 2 it is sufficient to show that $A^*_{Hound} \leq A^*_L$and $R^*_{Hound} \leq R^*_L$. Rearranging the condition on R using (4.10) and (4.12) gives

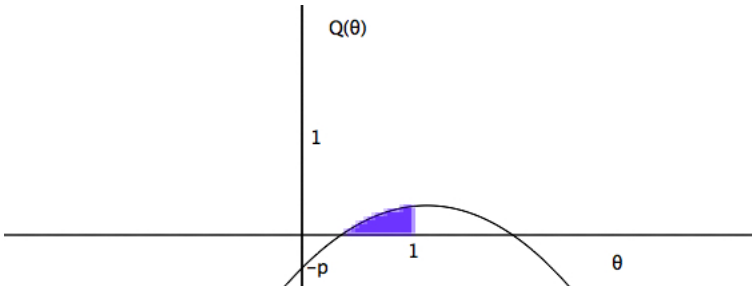

Figure 7.1: Quadratic in θ

the condition $p < 1$, which will always hold. Substituting (4.8) and (4.11) into the condition on A gives the condition $Q(\theta) = -\beta q(1-p)\theta^2 + \theta - p = a\theta^2 + b\theta + c \geq 0$. This quadratic's roots are real provided $1 - 4p(1-p)\beta q \geq 0$. This expression's left hand side is minimised at $p = 1/2$ so the roots will be real if $1 > \beta q$, which will always hold. Because a and c are of the same sign and $-b/2a$ is positive, both roots are positive

Evaluating the quadratic at $\theta = 1$ gives $Q(1) = 1 - [p + \beta q(1-p)] > 0$ and hence the larger root is strictly greater than 1 and, since both roots are positive, the smaller root is between zero and one. Therefore the quadratic is as in Figure 2 and Hounding is easier to sustain than Full Capture if θ is greater than its smaller root, θ^*

Cooperation in State (L, N) Only

Here we analyze the equilibrium which specifies collusion only for as long as the state is (L, N). This completes the space of equilibria under the restrictions made on strategies. The strategy profile is:

$$\varsigma = \begin{cases} 1 & K_t = (L, N) \\ 0 & \text{otherwise} \end{cases}$$

$$\gamma = \begin{cases} 0 & K_t = (L, N) \\ 1 & \text{otherwise} \end{cases}$$

The Media In all states other than (L, N) play reverts to the One Shot Nash. Using the subscript LN we find the value functions as:

$$\begin{aligned} V_{LN}^M[L, N, \gamma = 0] &= \tau A + \beta W_{LN}^M[N] \\ V_{LN}^M[L, N, \gamma = 1] &= \tau A + M + \beta \left[pq W_{LN}^M[Y] + (1 - pq) W_{LN}^M[N]\right] \\ V_{LN}^M[H, N] &= M + \beta \left[q W_{LN}^M[Y] + (1-q) W_{LN}^M[N]\right] = V_{LN}^M[H, Y] \\ V_{LN}^M[L, Y] &= M + \beta \left[pq W_{LN}^M[Y] + (1 - pq) W_{LN}^M[N]\right] \end{aligned}$$

The only state which doesn't specify play according to the One Shot Nash is (L, N). The Media's incentive compatibility constraint is therefore that $V_{LN}^{M}[L, N, \gamma = 0] \geq V_{LN}^{M}[L, N, \gamma = 1]$ or that:

$$\beta pq\left[W_{LN}[N] - W_{LN}[Y]\right] \geq M$$

Using the *i.i.d.* nature of the shock to write $W_{LN}^{M}(Y) = \theta V^{M}(H, Y) + V^{M}(L, Y)$ and $W_{LN}^{M}(N) = \theta V_{LN}^{M}(H, Y) + (1-\theta)V_{LN}^{M}(L, N, \gamma = 0)$ we can solve for the difference in post election continuation values as:

$$W_{LN}^{M}[N] - W_{LN}^{M}[Y] = \frac{(1-\theta)\tau A - (1-\theta)M}{1 - \beta pq(1-\theta)}$$

Substituting this into the incentive compatability constraint and solving gives:

$$A_{LN}^{*} = \frac{M}{\tau(1-\theta)\beta pq} \tag{7.20}$$

Using the expressions (4.8) and (7.20) we find that A_{LN}^{*} will exceed A_{L}^{*} if $(1-\theta)(1-\beta q(1-p)\theta) \leq 1$ which will always hold.

The Politician: Using the fact that play reverts to the One Shot Nash in all states besides (L, N) we calculate the value functions as:

$$\begin{aligned}
V_{LN}^{P}[L, N, \varsigma = 1] &= R - A + \beta p W_{LN}^{P}[N] \\
V_{LN}^{P}[L, N, \varsigma = 0] &= R + \beta pq W_{LN}^{P}[Y] \\
V_{LN}^{P}[L, Y] &= R + \beta pq W_{LN}^{P}[Y] \\
V_{LN}^{P}[H, Y] &= V_{LN}^{P}[H, N] = R + \beta q W_{LN}^{P}[Y]
\end{aligned}$$

The one incentive compatibility constraint for the Politician is that he prefers to make the transfer in state (L, N) i.e. that $V_{LN}^{P}[L, N, \varsigma = 1] \geq V_{LN}^{P}[L, N, \varsigma = 0]$ which can be rewritten as $\beta p[W_{LN}[N] - qW_{LN}[Y]] \geq A$. Using the fact that the state is *i.i.d.* allows us to rewrite the post election continuation values as $W_{LN}^{P}[N] = \theta V_{LN}^{P}[H, N] + (1-\theta)V_{LN}^{P}[L, N, \varsigma = 1]$ and $W_{LN}^{P}[Y] = \theta V_{LN}^{P}[H, Y] + (1-\theta)V_{LN}^{P}[L, Y]$. This allows us to solve for the critical value of ego rents as:

$$R_{LN}^{*} = \frac{1 - \beta q[\theta + (1-\theta)p]}{\beta p(1-q)} A$$

Comparing this expression to (4.10) shows that $R_{LN}^{*} \geq R_{L}^{*}$ provided $[1 - \beta\theta(1-p)] \leq 1$ which will always hold. Hence this final equilibrium will exist under stricter conditions than the Full Capture Equilibrium.

Comparative Statics

Full Capture Equilibrium

For the Media, differentiating (4.7) and (4.8) gives:

1. $\frac{\partial A_L^*}{\partial M}, \frac{\partial A_H^*}{\partial M} > 0$
2. $\frac{\partial A_L^*}{\partial \tau}, \frac{\partial A_H^*}{\partial \tau} < 0$
3. $\frac{\partial A_H^*}{\partial \theta} = -\frac{M}{\tau}(1-p) < 0,\ \frac{\partial A_L^*}{\partial \theta} = -\frac{M}{\tau}\frac{(1-p)}{p} < 0$
4. $\frac{\partial A_H^*}{\partial q} = -\frac{M}{\tau}\frac{1}{\beta q^2} < 0, \frac{\partial A_L^*}{\partial q} = -\frac{M}{\tau}\frac{1}{\beta pq} < 0$
5. $\frac{\partial A_H^*}{\partial p} = -\frac{M}{\tau}(1-\theta) < 0, \frac{\partial A_L^*}{\partial p} = -\frac{M}{\tau}\frac{(1-\beta q\theta)}{\beta p^2 q} < 0$
6. $\frac{\partial A_H^*}{\partial \beta} = -\frac{M}{\tau}\frac{1}{\beta^2 q} < 0, \frac{\partial A_L^*}{\partial \beta} = -\frac{M}{\tau}\frac{1}{\beta^2 pq} < 0$

For the Politician, differentiating (4.9) and (4.10) gives:

1. $\frac{\partial R_H^*}{\partial A}, \frac{\partial R_L^*}{\partial A} > 0$
2. $\frac{\partial R_H^*}{\partial q} = \frac{A(1+\beta(1-\theta)(1-p))}{\beta(1-q)}\left(1-\beta\left(\theta+(1-\theta)p\right)\right) > 0 \frac{\partial R_L^*}{\partial q} = \frac{A(1-\beta\theta(1-p))}{\beta p(1-q)^2}\left(1-\beta(\theta+(1-\theta)p\right) > 0$
3. $\frac{\partial R_H^*}{\partial p} < 0,\ \frac{\partial R_L^*}{\partial p} < 0$
4. $\frac{\partial R_H^*}{\partial \theta} = -A\frac{(1-p)}{(1-q)}\left[1+q\beta\left[1-\left[\theta+(1-\theta)p\right]\right]+q\left[1-\beta\left(\theta+(1-\theta)\,p\right)\right]\right] < 0,$
   $\frac{\partial R_L^*}{\partial \theta} = -A\frac{(1-p)}{(1-q)p}\left[2-\beta q(\theta+(1-\theta)p)-\beta\theta(1-p)\right] < 0$
5. $\frac{\partial R_H^*}{\partial \beta} < 0,\ \frac{\partial R_L^*}{\partial \beta} < 0$

Hounding Equilibrium

Differentiating (4.11) and (4.12) gives the comparative statics as:

1. $\frac{\partial A_{Hound}^*}{\partial M} \leq 0$ — 1. $\frac{\partial R_{Hound}^*}{\partial A} > 0$
2. $\frac{\partial A_{Hound}^*}{\partial \tau} < 0$ — 2. $\frac{\partial R_{Hound}^*}{\partial \theta} = -\frac{q(1-p)}{(1-q)}A < 0$
3. $\frac{\partial A_{Hound}^*}{\partial \theta} \leq 0$ — 3. $\frac{\partial R_{Hound}^*}{\partial q} = \frac{1-\beta(\theta+(1-\theta)p)}{\beta(1-q)^2}A > 0$
4. $\frac{\partial A_{Hound}^*}{\partial q} \leq 0$ — 4. $\frac{\partial R_{Hound}^*}{\partial p} = -q\frac{(1-\theta)}{(1-q)}A < 0$
5. $\frac{\partial A_{Hound}^*}{\partial \beta} = -\frac{M}{\tau}\frac{1}{\beta^2 q\theta} < 0$ — 5. $\frac{\partial R_{Hound}^*}{\partial \beta} = -\frac{1+q(1-\beta)(p+(1-p)\theta)}{\beta(1-q)} < 0$

Table 6: Newspaper Summary

Newspaper	Start Date	Observations	Ideology	Group
Guardian	Whole Sample	84	-.56	Left
Observer	Whole Sample	84	-.55	Left
Independent	Whole Sample	84	-.48	Left
Independent on Sunday	Whole Sample	84	-.47	Left
People	Whole Sample	84	-.43	Left
Sunday Mirror	Whole Sample	84	-.42	Left
Mirror	Jan. 1995	82	-.42	Left
Times	Whole Sample	84	.03	Centrist
FT	Whole Sample	84	.06	Centrist
Standard	Whole Sample	84	.06	Centrist
Sunday Times	Whole Sample	84	.09	Centrist
Sun	Dec 1999	32	.27	Right
News of The World	Aug 2000	46	.34	Right
Star	Jan 2000	35	.34	Right
Express	Jan 2000	37	.38	Right
Sunday Express	Jan 2000	40	.39	Right
Telegraph	Jan 2000	35	.48	Right
Mail	Whole Sample	84	.54	Right

Table 5: Summary Statistics

Variable	**Observations**	**Mean**	**s.d.**	**min**	**max**
hits	1230	13.8	29.79	0	405
log hits	1230	1.53	1.45	0	6.03
poll lead	1230	0.41	19.90	-30.11	29.78
time to election	1230	2.44	1.18	0.17	4.51
senior	1230	0.46	0.50	0	1
guilty	1230	0.65	0.48	0	1
punished	1230	0.43	0.50	0	1
resigned	1230	0.18	0.39	0	1
stood down	1230	0.09	0.28	0	1
zero	1230	0.28	0.45	0	1
claimant count	1230	1,454.66	552.59	822.42	2,476.97
inflation	1230	2.48	0.62	1.65	4.19
tabloid	1230	0.23	0.42	0	1
daily	1230	0.66	0.47	0	1
circulation	1230	1,112,575	931,839	160,087	4,273,407