Individual and Collective Performance and the Tenure of British Ministers 1945-1997

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Abstract

We study the effects of individual and collective ministerial performance on the length of time a minister serves in British government from 1945-97, using the number of resignation calls for a minister as an individual performance indicator and the cumulative number of such calls as an indicator of government performance. Our analysis lends support to a 'two-strike rule': ministers facing a second call for their resignation have a significantly higher hazard than those facing their first, irrespective of the performance of the government. A minister's hazard rate is decreasing in the cumulative number of resignation calls; but conditional on receiving a first resignation call, the hazard rate increases with the number of calls that all government ministers have faced in the past. Our message is that collective ministerial performance is a key determinant of whether a minister survives his first resignation call.

1. INTRODUCTION

How are rewards and punishments administered by the Prime Minister in a parliamentary system? How does the performance of an individual minister and that of the government in which he serves affect his rewards? [1] Are the relations we observe consistent with the theory of incentives, and with the existence of implicit conventions such as collective responsibility? These questions are central to developing a systematic understanding of ministerial careers. To answer them we analyze individual ministerial spells from the United Kingdom during the period 1945-1997, focusing on length of tenure as a measure of a minister's reward and on individual calls for his resignation as a measure of his performance. We aggregate individual performance measures by government to analyze further how collective performance affects individual tenure.

In parliamentary systems of government, becoming a minister represents the pinnacle of a political career. Nevertheless, whilst some ministers have long and distinguished careers, rising through the ranks fairly quickly, other ministerial careers are remarkable for their brevity, consisting of a short spell before a return to the back-benches. A key development in political science over the past years has been a focus on the causes of ministerial turnover, the first systematic analysis of which was by Alt (1975). For example, Huber and Martinez-Gallardo (2004) view turnover as related to the inherent uncertainty involved in the appointments procedure and in getting the right person for the job. They suggest that contextual features of the political process reduce uncertainty over the talent of a minister and thus enable the Prime Minister to allocate jobs to those most suitably qualified. Indridason and Kam (2007) suggest that the Prime Minister uses the cabinet reshuffle to stop ministers from treating their departments as their personal fiefdom; their simple insight is that budget-mazimizing behaviour by ministers is constrained when ministers know that, post-re-shuffle, a potential rival might benefit from current budgetary allocations. Berlinski et al. (2007) focus on the length of ministerial careers as an indicator of ministerial success, suggesting that higher quality ministers survive longer. Using data from the UK they show that individual ministerial characteristics are an important determinant of ministerial tenure, even when controlling for the features of the governments in

[1] Following standard use in principal-agent modeling we use the female pronoun for the principal (in this paper, the Prime Minister) and male pronoun for agents (in this paper, the minister).

which ministers serve. Such individual characteristics as educational background may, they argue, be an indicator of the latent quality of a minister.

A key feature which links these papers is a focus on fixed attributes of either individual ministers and/or political systems. What is missing in these analyses are direct performance indicators for ministers and for the governments in which they serve. Whilst the use of performance indicators to analyse career development is well developed in the economics literature (Prendergast, 1999; Gibbons and Murphy, 1990, 1992), so far there has been little in political science beyond examining the pork barrel and constituency service effects upon re-election chances (Ashworth, 2005; Francis et al., 1994). In this paper we develop a conceptual framework which draws upon the existing principal-agent literature, and motivate our discussion on performance evaluation within the broader context of collective ministerial responsibility. Our argument, which we flesh out in the following section, leads to testable propositions on ministerial tenure. It suggests that tenure is determined by individual ministerial performance, by the performance of the government in which a minister serves and by the interaction between the two.

Using data on the tenure of all ministers who have served in British government from 1945-97 we estimate Cox Proportional Hazards model that conditions on individual attributes and government fixed affects. Our individual performance indicator is the number of resignation calls a minister faces during his time in office. These calls might be directly related to aspects of ministerial performance or to that of his department, or related to personal aspects of his behavior such as sexual or financial misdemeanors. Our aggregate performance measure is the cumulative number of such calls by government.

We show that the hazard rate of a minister increases when he faces a resignation call with a steep increase in the probability of leaving government after a second call. Perhaps more surprising is that the hazard of any given minister is affected not only by his own performance, but also by that of his colleagues. Our estimates reveal that the hazard rate of a government minister decreases whenever the cumulative number of resignation calls increases. When we allow for an interaction between our individual and government performance measure, we find that the likelihood of leaving government upon receiving a resignation call is increasing in the cumulative number of resignation calls.

The following section provides some motivation for our empirical model. In Section 3 we introduce the data and provides some descriptive statistics. In section 4 we describe our empirical specification. Section 5 presents our results and Section 6 concludes.

2. Individual and Collective Performance and the Tenure of Ministers

As every student of British politics knows, ministerial relations are governed by the twin doctrines of individual ministerial responsibility and collective cabinet responsibility. According to the former, ministers are responsible for their own conduct – both personal and departmental – and that of the staff of their department.[2] Under the terms of individual ministerial responsibility if the minister is involved in some private scandal of, say, purported financial or sexual misconduct, public scandal such as a rash statement concerning some aspect of his departmental responsibility, or does not act decisively following controversy over some aspect of the administration of his department, then the minister may face calls for his resignation. His Prime Minister and cabinet colleagues may rally round and support him, or they may make clear that he should resign.

Under the British Constitution ministers hold their position at the pleasure of the Crown and are appointed on the recommendation of the Prime Minister (Jennings, 1959). A Prime Minister will respond to various motives in choosing her ministers: she will need to keep different factions within her party happy; she will need to give posts to key party figures; reward those who helped her to become leader of her party; and reward those who have shown past loyalty. However, whatever the initial reason for appointing someone to a ministerial position their retention of that position, (which is the focus of this paper), will depend in principle upon their performance and that of other ministers.

A useful starting point is to consider ministerial tenure in terms of a bilateral relationship between the Prime Minister and a minister. A government where ministers perform well is more likely to be re-elected and so good ministerial performance provides an incentive for the Prime Minister to retain the minister. Thus one might view the length of time served as reward for ministerial performance. Whilst this implicit contract cannot be enforced in the courts, evidence of its existence may be found in the data; put simply, those

[2]Departments are essentially defined in terms of the responsibility of the minister concerned (with some junior ministers taking responsibility for aspects of a departmental brief overseen by their cabinet minister) (Dowding, 1995), pp. 17-20.

ministers who perform more ably should survive longer than those whose performance is below par.

Following Strøm (2000) one might think of the relationship between a Prime Minister and her ministers as one between principal and agent. As he argues, although "parliamentary regimes may be better equipped to deal with problems of adverse selection.....the weaker capacity for ex post monitoring leaves parliamentarism more exposed to moral hazard" (Strøm 2000, p. 278). The crux of the problem is that a Prime Minister does not directly observe the effort of her ministers which determines the outcome of a ministerial task. However, she observes a variety of performance measures such as, for example, the success or failure of the minister's policy initiatives and media evaluations of his performance. The theory of incentives says that the principal should reward an agent using any performance measure that (conditional on the other measures of performance used) has a positive informational content (Gibbons, 2005; Baker et al., 1994; Holmström and Milgrom, 1979; Holmström, 1982, 1979). The weight they should receive in the reward scheme will depend on the responsiveness of these measures to effort and quality of the agent, the degree of alignment of these measures with the objectives of the principal and the level of risk they involve. *Ceteris paribus*, the more responsive, the higher the degree of alignment, and the lower the risk involved the more weight the reward scheme should place on those measures.

Straightforwardly we can think of a contract which specifies tenure as a function of a set of observed indicators. For example, we might believe that a resignation call is more likely to occur when the effort of a minister falls below some threshold. Such a call then serves as a discrete indicator of ministerial performance. Intuitively we would expect the relationship between it and observed tenure to be negative; a call for a minister to resign leads to shorter tenure, since a Prime Minister will sometimes accede to that call.

Of course, no performance measure is perfect and there are problems involved in the use of an imperfect measure of effort. To illustrate consider, for example, the issue of homeland security which in the British system of government is the responsibility of the Home Secretary. Suppose that a terrorist attack takes place on a particular day. The fact that the attack is successful may reveal vulnerabilities in preparation, flaws in information processing, and in communication between departments, all of which are related to

ministerial performance. But of course, whether a terrorist attack succeeds might be due to factors that are not under the control of the minister such as the vigilance of the public. Further it is not always clear how accountable is a minister responsible at the time a problem emerges. How much blame should an incumbent minister take for failures in preparation if he has only been in the job for a short time? In short, a resignation call is a noisy signal of the minister's performance, compounding features for which he is rightly responsible in his capacity as minister with subsidiary factors, or random shocks, beyond his control.

Nevertheless, such random shocks which might affect the performance of a minister are likely to be correlated across government departments: an economic downturn caused by a change in oil prices can lead to a tightening of the budget and to pressures on service delivery across departments; a health scare, such as a virulent new flu strain, could affect health services, transport and education, amongst other things. Whereas different ministers are responsible for these areas, their performance is conditional on a common shock and the evaluation of that performance should reflect this common cause. Thus, one measure which might be used in addition to an individual performance measure is the performance of other ministers: if a minister is seen to fail at a time when others falter also, his performance may not be judged so harshly; conversely, if a minister is seen to succeed when others around him flounder, then his performance will be judged more positively. Indeed, to the extent that the performance of others can help eliminate noise in any individual measure of performance, it may be a good idea to include them in the reward structure of an agent.

In theory these shocks may be observed by a Prime Minister when deciding whether to fire or to retain a particular minister. In practice, and in order to test this theory, we would require measures for every possible common shock and this is not feasible. Nevertheless we can use a single measure which encompasses many of these common causes. As our measure we use the cumulative number of resignation calls over a government's life span. We think that our cumulative, rather than an instantaneous measure, of collective performance might be a natural way for a Prime Minister to aggregate the relevant information.

For example, whereas the performance of health and emergency services could be immediately assessed in light of a flu outbreak, the effects on educational performance (such as test scores) would be felt some time thereafter.

Of course, there are other channels through which the common performance of the government can affect the durability of a minister's position besides the noise filtering we have identified. One such channel is an understanding of the doctrine of collective responsibility. This has its origins in the 18th century through the practice of collusion between ministers in the advice they gave to the sovereign (Mackintosh, 1977). Such collusive practices acted as a check on the sovereign, allowing the Prime Minister and the cabinet to develop and pursue specific policy agendas. Moreover, it also provided protection for individual ministers, limiting the monarch's ability to single out individual ministers for blame. By the 19th century Dicey identified a convention of collective ministerial responsibility which involved unanimity in the advice given to the crown (Turpin, 1993). It developed further under Lord Salisbury who set out the formulation of joint or collective responsibility in a speech to parliament.

> "For all that passes in Cabinet every member of it who does not resign is absolutely and irretrievably responsible and has no right afterwards to say that he agreed in one case to a compromise, while in another he was persuaded by his colleagues ... It is only on the principle that absolute responsibility is undertaken by every member of the Cabinet, who, after a decision is arrived at, remains a member of it, that the joint responsibility of Ministers to Parliament can be upheld and one of the most essential principles of Parliamentary responsibility established." (*Hansard*, Vol. 239, cols. 833-4.)

Salisbury instantiated this understanding of collective responsibility in order to stop what today would be described as ministers briefing against each other, though not through friends to newspapers as such, rather to their dinner party guests in their grand houses. Collective responsibility implies solidarity with ones fellow ministers: because each minister takes responsibility for the policies of the government as a whole, and so is expected to defend their colleagues, all receive at least some protection should a policy within their remit be deemed to have failed. As Turpin (1993, p. 58) writes

> "Collective responsibility provides a shield for the individual minister, only rarely so emphatically withdrawn as to leave the minister no alternative but resignation."

It is clear that the convention of collective responsibility is a double-edged sword. It acts as a form of protection for an individual minister when policies pursued in his department are deemed to have failed and when the minister's position is under threat. In this case collective responsibility, as a convention, pools the individual risks of ministers, thus making it less likely that a minister bears the full brunt of a policy failure through, for example, the loss of his ministerial job. Nevertheless the convention also induces a cost to being a member of the government. The principle of solidarity which underpins collective responsibility entails that ministers jointly share the responsibility of policy failure; a minister may not abrogate himself from responsibility for a failed government policy.

We take the number of resignation calls made to government ministers as a measure of an individual minister's exposure to collective responsibility. Our discussion suggests different channels through which collective responsibility may affect the tenure of a minister. Contrary to our earlier discussion, which suggested that a minster's survival probability is enhanced when his colleagues are deemed to have failed, one argument based on the notion of collective responsibility leads to the opposite conclusion. That is, conditional on his performance, an increase in the number of ministers who are protected under collective responsibility will leave a minister in a more vulnerable position.

Consider, for example, a minister who is a marginal member of the government, in the sense that the Prime Minister is indifferent between maintaining him or sending him to the back-benches (perhaps his qualities are no more apparent than those of an average minister). If he shares some blame for his colleagues performance, (as he does under collective responsibility), then should any policy failure or scandal arise then he will lose all favor; any shock which leads to a shake up of government will lead to a termination of his government career.

Collective cabinet responsibility also has other effects. The number of ministers protected affects a minister's own political career. A ministerial career is more valuable when an office holder is held in esteem due to the position he holds. As Caselli and Morelli (2004) argue, some of the rewards of a political career are due to association and so the esteem

accorded an office holder is directly related to the performance of those around him. Thus a minister may obtain higher esteem (an "ego-rent") when he serves in a government in which fewer ministers have been protected under collective responsibility. Serving in such a higher-quality government can also help re-election as a member of parliament. Moreover, if a high quality government is more likely to be re-elected, service in such a government enhances the prospect of continued office. In short, there are many potential rewards for serving in a publicly respected government.

For collective responsibility to function according to the principles outlined by Salisbury, some corrective mechanism may be required to ensure that the reputation of the government does not fall too low.[3] The office of Prime Minister provides just such a mechanism. As *primus inter pares* she can conditionally protect threatened ministers or withdraw protection where she sees dissension in the cabinet or that too much damage is being done to the reputation of the government. Whilst the Prime Minister exercises her own judgement, she is undoubtedly swayed by what she perceives to be the "mood" of her ministers (and her party). Ministers can make their feelings known, without explicitly breaking collective responsibility, through non-attributed leaks to the press which often take the form of quotes from "friends" or "colleagues close to the minister". In this way threatened ministers can become isolated and pressure brought to bear on the Prime Minister to withdraw the ailing minister's protection. In short, as the government's reputation declines, a Prime Minister should be less willing to support a threatened minister. Correspondingly, upon receiving a resignation call, ministerial tenure should be decreasing in the number of calls made to ministers of the same government.

3. Data and Descriptive Statistics

To assess the empirical relevance of our arguments we analyze data on all British ministers from 1945-97. In all, our analysis spans nineteen terms from the first Attlee administration until the end of John Major's second term. Each minister is coded according to rank, the government and the Prime Minister under which he serves.[4] Each minister is

[3]Indeed, following on from the discussion above, *ex-ante* each minister would wish to commit themselves to any mechanism which had such an effect.

[4]If they appear in Butler and Butler (2000, 1996), then virtually all ministers as we define them are included in our sample. Reasons for exclusion include lack of information on age or inconsistencies in Butler and Butler that we were not able to rectify from other sources.

also coded for date of birth, education, gender, and whether or not the minister is ennobled. Table 1 provides the definitions of each of the variables used in the analysis and provides basic descriptive statistics for the whole sample.[5]

We analyze the length of time that elapses from when a minister enters government until he leaves or the government terminates. A minister leaves the government following an individual resignation or following a reshuffle. We treat the end of a government term as occurring either when there is an election, or when there is a change of Prime Minister. We treat the starting day for each minister as occurring two weeks from the day the government is formed thus allowing for a period during which the Prime Minister might shuffle the cabinet.[6] Similarly, we censor all ministers two weeks before the end of government to avoid problems generated by coding errors at the end of governments.[7] For simplicity we refer to ministerial spells and ministers as equivalent from now on.

As a performance measure we use a call which is made for a minister's resignation. This data has been collected from *The Times Newspaper* as detailed in the Appendix. As the language of parliament and the press has not remained constant over the period, we coded not only those cases where an explicit call for a resignation was made, but also those where the minister was "severely criticized", described as "being in difficulty" or asked to "consider his position". All such cases are referred to as "resignation calls". [8]

As we can see from Table 2 there are 158 ministerial spells in which a resignation call is made. Of these, 105 ministers receive only one such call, 43 receive two, and only 10 receive 3 or more. In total there are 225 resignation calls in the data. The ministerial spells we observe are evenly split between the periods 1945-1970 and 1970-1997. In the latter

[5]We should note that whilst we have 2230 spells, we do not have that number of separate people serving as ministers – since many people have served at several levels and during several administrations.

[6]These days the post-election shuffle rarely takes more than a couple of days but in the past shuffling the cabinet was a more leisurely affair.

[7]We chose this rule to account for inconsistencies in the end dates reported by Butler and Butler for ministers who serve out their term.

[8]Of course, some resignations occur without any preceding call. Nevertheless, individual ministerial resignations such as Dalton in November 1947, without a preceding call still demonstrate some failure in performance. Dalton resigned because a lobby correspondent he had briefed on his way to the Chamber leaked reported details prior to the speech being made. He resigned the next day before anyone had realized Dalton was responsible for the leak though the Opposition had asked for an inquiry. Whilst no call was made, it was clear to him that he would be asked to resign. Whilst not unique Dalton is unusual in that most resignations over individual responsibility occur following a call for resignation.

period there are a larger number of resignation calls with a more or less proportional increase in the number of ministers receiving one, two or more such calls. Thus we observe that resignation calls have grown over time and this may be due to governments facing ever closer scrutiny from the media.

As an aggregate measure of government performance we use a cumulative index of resignation calls over the period in which the government is in office. Table 3 shows the total number of resignation calls during the course of, and by the duration of, each government. Figure 1 plots the cumulative number of resignation issues by government. The peaks on this graph represent the termination of each government in our sample. The height of the peaks of this graph provide a rough indication of the reputation of each government. The highest peaks (lowest reputation) are recorded during the Wilson period of the 1960s, the Thatcher administrations in the 1980s, with Major's administration breaking all previous records in the 1990s. In fact, the number of resignation calls increases over time from 92 in 1945-1970 (including the 1966-1970 Wilson Government) to 133 in the 1970-1997 (starting from the Heath 1970-74 government).

Our aim in this paper is to improve our understanding of ministerial tenure by focussing on individual ministerial performance, the collective performance of the government and upon the interaction between the two. We explore these effects in Figures 2-5 where we initially plot the ministerial survivor functions for our sample of ministers. The survivor function denotes the probability that the time to an event is greater than some time interval of length T. Equivalently, the survivor function shows the proportion of the sample surviving beyond some specified time-point, in the sense that, for that proportion of the sample, the event has not occurred at T. For convenience, we plot the survivor functions for ministers with time recorded as months.

Figure 2 shows the survivor function with regard to resignation calls for the whole of our sample. This provides a graphical representation of the length of time a minister might expect to serve before becoming involved in his first resignation issue. We observe that in governments which see through their whole term of office (5 years in government), on average, 25 percent of ministers are affected by such resignation calls.

Figure 3 explores the effect of our performance measure on ministerial tenure. It provides a graphical representation of the survival probability of a minister during his first five

years in office, breaking down the sample according to those ministers who have not faced a resignation call ($r = 0$) and those who have faced at least one such call ($r = 1$). As one would expect, the survivor function falls more sharply for ministers experiencing one or more resignation calls. In governments which see out their term of office, 70 percent of ministers who have not been involved in a resignation call survive; in contrast only 30 percent of ministers survive who have faced one or more resignation calls.

Figure 4 explores the impact of the government's performance, illustrating the survivor function evaluated at different levels of our cumulative resignations index. In particular, we look at the survival function of ministers in governments where this cumulative index turns from less than 8 to more than 8, with 8 being the median number of cumulative resignation calls. Ministers serving in governments that have experienced more cumulative calls than the median tend to survive longer, although the difference seems small.

Figure 5 looks at the interaction effect between government performance and that of the individual minister, illustrating the survivor function for ministers who have not faced a resignation call and those who have faced at least one such call, evaluated for the case where the cumulative index of resignation issues is less than 8 (in panel 5a) and more than 8 (in panel 5b). In observing these graphs, two effects are immediately apparent. Firstly, the difference in the survival probabilities between those who have faced a resignation call and those who have not, is strikingly larger when the cumulative number of resignation calls is greater than 8. Evaluated at the 40 month period, roughly 40 percent of ministers who have faced a resignation call survive beyond that time-point when the cumulative number of resignation calls is greater than the median. This compares with a figure closer to 25 percent when the the cumulative number of resignation issues is less than the median. These figures thus illustrate the interaction effects of a government's reputation on expected tenure. The message is clear, conditional on receiving a resignation call a minister's survival depends on how many such calls have been previously made to members of his government.[9]

Our graphs suggest that a minister's chances of survival depend not only on his own performance but also on that of his colleagues. Of course, if we are to identify the effects of

[9]The differences reported in Figures 3-5 are all statistically significant at conventional levels.

our performance indicators, we must also take into account the characteristics of different ministers in our sample and of the governments they serve in. Table 4 presents mean length of observed tenure, number of resignation calls and other average characteristics of our sample of ministers, by the rank of the minister. Indeed the descriptive statistics suggest obvious correlations between these characteristics and tenure. For example, the mean observed tenure is longer the further up the ministerial ladder you climb, although these differences are not very pronounced. On average a cabinet minister serves two and a half months longer than a government whip. This feature is also correlated with other aspects. Cabinet ministers are older on average, some nine years older than junior ministers and there are also differences to be found in the level of education at each ministerial rank. As shown elsewhere, there are large differences in the characteristics of ministers by government (Berlinski et al., 2007). For example, on average 81 per cent of Conservative ministers have attended public school (i.e., private education in the UK) and 60 per cent of Conservative ministers have been to Oxbridge (i.e, Oxford or Cambridge Universities). This compares with an average of 29 per cent of Labour ministers with a public school education, with 31 per cent of Labour ministers having been to Oxbridge.

Whilst insightful, these descriptive statistics can take us only so far. Both overall ministerial tenure and the likelihood of receiving a resignation call are affected by ministerial and government characteristics. Our empirical strategy, to which we now turn, helps disentangle these effects.

4. Empirical Strategy

In the previous section we have suggested ways in which performance might affect ministerial tenure. We suggested that when performance is based upon a resignation call, then such a call will have a negative effect on tenure. This is not the only way in which performance might affect tenure and we suggested that the aggregate performance of the government will influence tenure as well. Finally we suggested that the effect of the individual performance indicator will vary with the performance of the government as a whole. Specifically, the effect of a resignation call upon tenure is larger the poorer the performance of the government in which he serves.

To test our key hypotheses, we estimate Cox proportional hazard models. For reasons well discussed in the political science literature, straightforward OLS estimations of time to an event are problematic (Box-Steffensmeier and Jones, 1997); this is due to issues of data censoring (which we discuss below), and, perhaps more importantly, due to the likely violation of the assumption of normally distributed error terms in such analysis. Here we focus our attention instead on estimations of the hazard rate of ministerial spells at any given point in time t, conditional upon the spell being of a duration at least equal to t. The hazard rate is the ratio of the failure rate – that is the instantaneous probability that a minister will resign – to the survival function.

Expressed in the proportional hazards format our hypothesis leads to the following specification:

$$h_{igt} = h_0(t) \times \exp\left[r_{igt}\psi' + \beta cr_{gt} + (r_{igt} \times cr_{gt})\phi'\right], \tag{1}$$

where $h_0(t)$ is the minister's baseline hazard at t. The first bracketed term on the right-hand side, r_{igt} is a vector of ministerial performance measures constructed from our indicator variable; specifically we code 3 dummy variables corresponding to a first, second and third or higher resignation call respectively. The second term cr_{gt} is our measure for government performance; specifically the cumulative number of resignation issues at any given point in time. The third term is an interaction between our vector of individual performance indicators and our government performance measure.

Our discussion above suggests that ψ should be positive; a resignation call makes it more likely that a minister resigns. Conditional on this event we expect that β be either positive or negative depending on whether performance evaluation or collective responsibility has a larger effect. Our discussion above about the effects of collective responsibility suggests that the interaction between these two terms, estimated by the coefficients ϕ' should be positive – as more ministers are protected under collective responsibility the hazard rate for a minister, conditional on receiving a resignation call, is higher.

To separate the effect of our performance indicators from other confounding variables we take into account the fact that individual performance may be correlated with individual ministerial attributes. Using the model estimated in Berlinski et al. (2007) as our guide, we include variables for educational background, gender and ministerial experience (including a measure of whether the minister had resignation calls in previous governments).

Each of these variables are recorded as fixed at the beginning of each spell, thus allowing us to estimate the effect of the attributes a minister brings to government, upon his hazard rate. We also take account of a time-varying feature, namely a minister's rank.

We account for the fact that ministers' and government performance could be correlated with systematic features of the governments in which these ministers served by including a full set of government characteristics. We start from a restricted set of controls such as size of government majority, party and government term and go as far as including government fixed effects (i.e., a full set of interactions between Prime Minister and government term). The models we estimate are variations of the following proportional hazards model,

$$h_{igt} = h_0(t) \times \exp\left[r_{igt}\psi' + \beta cr_{gt} + (r_{igt} \times cr_{gt})\phi' + X_{ig}\theta' + B_g\pi'\right], \tag{2}$$

where X_{ig} is a vector of individual ministerial characteristics and B are a set of government characteristics.

The Cox proportional hazards model makes no restrictions on the shape of the underlying baseline hazard. However, it does not allow the effect of our performance indicators to be affected by the length of time the government has been in existence. This assumption appears strong, as one might expect the Prime Minister to react differently to resignation calls which occur at the beginning or towards the end of the mandated government term. To look at this issue we study how our conclusions change by looking at two sub-samples: one includes the first 18 months in government only; and the other includes the first 36 months in government.

Finally we account for the fact that media exposure of ministers may vary systematically during our period of analysis. This may be reflected in the Prime Minister's response to resignation calls. To deal with this we split our data set and compare the estimates across different time periods. Specifically we look at the period 1945-1970 and the period 1970-1997, the latter period being one in which we observe a larger number of resignation calls reported by the media.

5. Hazard Rate Estimates

We estimate the hazard rate of ministers, conditional on both individual performance and characteristics as well as the performance and characteristics of the government in which they serve. In Table 5 we present the estimates from models which assess the impact of our individual performance measure. The benchmark model includes controls for ministerial traits such as gender, educational background, age and nobility. It also controls for ministerial attributes which relate to a minister's service in previous governments. Specifically we control for whether a current minister has past experience of government and whether during that time he received a resignation call. Finally, we control for a minister's position in the government rank.

Estimates for the benchmark model reveal that the hazard rate for a minister facing his first resignation call is 2.5 times higher than that of a minister who has not yet faced such a call. A minister facing a second resignation call has a significantly higher hazard rate still; a second call increases the hazard rate a further 7.5 times (and 10 times relative to the hazard rate of a minister with no previous calls to his name). Ministers facing a third resignation call are 4 times more likely to leave government than ministers without resignation calls. The latter estimate must be interpreted carefully as few ministers survive a second resignation call.[10]

In the remaining models estimated in Table 5, we add to the benchmark model controls for fixed attributes of the government in which a minister serves. In column 2 we include measures for the size of the government majority, which party is in power and government term. Column 3 adds to column 2 fixed effects for the Prime Minister under which the minister serves. Finally column 4 includes government fixed effects (i.e., a full set of interactions between Prime Minister and government term). In all, these variables have almost no effect on the estimates of our individual performance measures on tenure.

[10]Of course there are counter-examples to the "two-strike" rule which show that there are other considerations than performance at stake in decisions to remove ministers. For example, George Brown was a close colleague and highly valued by Harold Wilson and also Deputy Leader of the Labour Party. He offered to resign in July 1966 being persuaded to retract the offer after Wilson and the parliamentary party made clear they wanted him to stay. As Foreign Secretary he was criticized for his policy on the US in October 1967 and attacking Lord Thomson and his newspapers in November. On both occasions there were calls for his resignation. He finally resigned in March 1968 in protest after he felt he was not consulted over the decision to have the Queen proclaim a Bank Holiday to stop gold dealings. He remained Deputy Leader of the Labour Party. These, and a few similar examples, are the exceptions which prove the rule.

In Table 6, we turn our attention to the effects of government performance and present a similar set of models to those in Table 5, but with the added feature of a variable that records the cumulative number of resignation calls. Our estimates reveal that the hazard rate of a government minister is decreasing by around 9 percent for each unit increase in our cumulative index. Thus, an increase in the cumulative number of resignation calls within a prime ministerial term reduces the hazard rate of an individual minister. This effect is robust to adding different set of controls for government characteristics. The impact of the individual resignation call is similar to that estimated in Table 5.

These direct effects do not take into account how the collective performance of the government interacts with that of the individual minister. In Table 7, we estimate a model which includes an interaction term between the individual and collective performance measure. We observe that the likelihood of leaving government upon receiving a resignation call is increasing in the cumulative number of calls. In particular, we find that, upon receiving a first resignation call, a minister's hazard rate increases by 6 percent for each previous call made to a minister in the government he serves. We find no evidence of a similar interaction effect when considering second and third resignation calls.

Taken together, our estimates are consistent with predictions based on the theory of performance evaluation when applied to our data on ministerial tenure. The largest direct effect upon a minister's hazard rate is due to his own performance, particularly if he receives a second call. On balance, an increase in the cumulative resignations index has a direct effect of reducing ministerial hazard. Although, as argued above, the convention of collective responsibility might increase a minister's exposure, the noise filtering effects of relative performance evaluation appear to dominate. Collective responsibility does appear to be important however in that, upon receiving a resignation call ministerial hazard is higher when other ministers of the same government have faced similar calls; a minister bears some of the brunt of his colleagues failures.

In the first two columns of Table 8 we look at whether the impact of resignation calls differs by whether they occurred during the first 18 months of government or during the first 36 months of government. In Table 8, for brevity, we only present models with the full set of controls. In column 1, we look at the first 18 months only and in column 2 at the first 36 months. The effect of a second resignation call has a larger effect when both

calls occur within the first 18 months of government. In both cases the direct effect of government performance decreases the hazard, but the magnitude of this effect appears to be stronger in the first 18 months of government. Finally, the interaction between government and individual performance shows also an increasing effect particularly after a first call for resignation. This effect appears significantly larger during the first 18 months in government. One interpretation of these results is that earlier into a government term a prime minister puts more weight on collective performance measures.

In columns 3 and 4 of Table 8 we look at whether the effect of resignation calls differ over time: column 3 of this table estimates the model for the period 1945 to 1970 (including the Wilson 1966-1970 government); column 4 estimates the model for the subsequent period. Results tend to be qualitatively similar with the exception that ministers facing more than one resignation call appear to have a higher hazard rate in the latter period. However, further analysis of the data, as revealed in Table 2, shows that the number of cases involved is small; only 2 ministers face a third resignation call in the period 1945-1970 and 8 in the period 1970-1997. Thus, on this evidence it would appear that higher exposure to the media has not changed the way the Prime Minister reacts to resignation calls.

We turn briefly to analysis of the individual background variables. Comparing our results, which are conditioned on performance indicators, to those in Berlinski et al. (2007) we find strong similarities. To give a few: those with Oxbridge backgrounds and those with higher ministerial rank are more durable; previous experience in government tends to increase the hazard rate of a minister; but here we find no significant effect of having had a resignation call in a previous government on current durability.

6. Conclusions

We have provided an analysis of the effects of individual and collective ministerial performance on the length of time a minister serves in British government for the period 1945-97. We used the number of resignation calls for a minister as an individual performance indicator and the cumulative number of such calls as an indicator of government performance. We asked whether the relations we observe in these data are consistent with the theory of incentives and with the existence of implicit conventions such as collective responsibility.

Our analysis shows the data to be consistent with the theory of incentives. A resignation call increases the likelihood that a minister returns to the back-benches, but as the number of colleagues who have faced similar calls rises his hazard depreciates. A minister's tenure thus reflects not only his own performance but is also directly responsive to that of his colleagues. Indeed our results indicate support for the hypothesis that a minsters performance is evaluated relative to that of his fellow ministers. Whilst the paper adds to previous empirical analysis of how the Prime Minister manages her cabinet (Indridason and Kam, 2007, 2005; Dewan and Dowding, 2005; Huber and Martinez-Gallardo, 2004), it presents the first real evidence of relative performance effects upon ministerial tenure.

The results are consistent with our interpretation of collective responsibility and add to our understanding of this convention in cabinet governments. Our argument is that collective responsibility entails the pooling of ministerial risks which provides benefits, in the form of protection for individual ministers, as well as costs, in that all ministers are affected by a fall in the government's reputation when a minister is so protected. The Prime Minister can ensure that the reputation of the government does not fall too low by limiting the amount of protection on offer, but this means that a minister facing a resignation call has a lower chance of survival the more such calls his colleagues have faced. As such the cumulative number of resignation calls measures a minister's exposure to collective responsibility. Our empirical analysis shows that, when a minister faces a resignation call, his hazard rate is increasing in the number of resignation calls cumulated over the lifespan of the government. Thus ministers share collective responsibility for their colleagues failures in a very real sense: their expected tenure upon receiving a resignation call is shorter the greater their exposure to collective responsibility. Our analysis provides the first evaluation of the costs of collective responsibility faced by individual ministers.

Our analysis also lends support to a "two-strike rule" operating in British government: ministers facing a second call for their resignation have a significantly higher hazard than those facing their first, irrespective of the performance of the government. Our results are thus of relevance to previous formal analysis of ministerial turnover. For example, Dewan and Myatt (2007) have developed a model based on an (assumed) "two strikes rule" whereby a minister is always fired when faced with a second resignation call. Our

empirical results, provide strong empirical evidence for the existence of such a rule and thus justification for its use as a modeling assumption.

Why such a rule is optimal has not, as yet, been addressed. Moreover, our results suggest that the likelihood that a minister is fired on a "first-strike" is affected by the overall reputation of the cabinet, and specifically by the cumulative number of ministers previously affected by resignation calls. In all our results suggest interaction effects between government performance and the hazard rates of ministers which should be investigated further in future theoretical and empirical work.

APPENDIX

The resignation data was collected using the following methods: originally (i) all ministers noted from Butler and Butler (1986, 1994, 2000) and official sources. (ii) *The Times* index consulted year-by-year noting all references to departments, ministers by job and ministers by name and cross-referred to events to build up a comprehensive picture of the major political events of each year. (iii) All potential resignation issues are consulted in *The Time*s on microfilm. Since the advent of *The Times* online, ministers have been surfaced together with stories cross-referenced with words "resign*", "difficulty", "trouble", "consider AND position". Cross-references were made to other newspapers, Hansard, and through biographies, autobiographies and other historical sources. The method for identifying a "resignation call" is simple. If someone in the House of Commons or the press, or from some non-political organization (understood broadly) suggests the minister should resign, or the press suggests the issue is "seriously damaging" or some similar phrase then it is defined as a "resignation call". Subsequent "resignations" were coded as such if the minister resigns or is replaced in a reshuffle and returns to the back-benches.

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Table 1: Definition of Variable and Descriptive Statistics

Variable	Definition	Mean (Std. Dev.)
Tenure	Ministerial tenure in months by government. Failure is defined as leaving government at least two weeks before the end of government. There are no left censored variables. Right censoring occurs when someone is still in post two weeks before the end of a government term. Ministers who fail during the first two weeks of government are dropped.	26.89 (16.46)
Individual calls for resignation	Number of individual calls for resignation (See Appendix for sources).	0.04 (0.20)
Cumulative government resignation calls	Number of resignation calls accumulated by the government. Change occurs each time there is a resignation call for a government minister.	2.28 (4.28)
Public school	Dummy variable equal to one if attended public school and zero otherwise.	0.62
Oxbridge	Dummy variable equal to one if attended university at Oxford or Cambridge and zero otherwise.	0.50
Age	Age in years at the start of ministerial spell.	49.17 (8.78)
Female	Dummy variable equal to one if female and zero otherwise.	0.05
Some experience	Dummy variable equal to one if a minister has served under previous governments and zero otherwise.	0.61
Resignation calls in the past	Dummy variable equal to one if a minister had resignation calls in a previous government and zero otherwise.	0.06
Noble	Dummy variable equal to one if unelected peer and zero otherwise.	0.21
Cabinet Ministers	Dummy variable equal to one if cabinet minister and zero otherwise.	0.16
Ministers of Cabinet rank	Dummy variable equal to one if minister of cabinet rank and zero otherwise.	0.30
Junior Ministers	Dummy variable equal to one if junior minister and zero otherwise.	0.35
Whips and Members of HM Household	Dummy variable equal to one if whip or member of HM Household and zero otherwise.	0.19
Majority	Majority is defined as the percentage share of the house commanded by the governing party.	54.35 (4.01)
Labour	Dummy variable equal to one if Prime Minister belongs to the Labour party and zero otherwise.	0.37
Term	Term currently being served by the Prime Minister (first, second or third). When conditioning on this variable in the regression analysis 2 dummies are used.	
Prime Minister	Eleven Prime Minister identifiers. When conditioning on this variable in the regression analysis 10 dummies are used.	

Notes: Data source is Butler and Butler (2000). There are 2,230 spells in total.

Table 2: Number of Resignation Calls for Ministers with Resignation Calls

Resignation Calls	All	1945-1970	1970-1997
One	105	34	71
Two	43	13	30
Three or More	10	2	8
Total	158	49	109

Notes: See Table 1 for the definition of variables. The period 1945-1970 includes the Wilson 1996-1970 government and the period 1970-1997 starts with the Heath 1970-74 government. There are 1087 spells in the first period and 1143 in the second.

Table 3: Resignation Calls and Government Duration

Government	Resignation Calls	Government Duration (in months)
Attlee 1945-50	9	54.82
Attlee 1950-51	12	19.97
Churchill 1951-55	6	41.21
Eden 1955	0	1.61
Eden 1955-57	6	19.48
Macmillan 1957-59	10	32.79
Macmillan 1959-63	19	48.2
Douglas-Home 1963-64	2	11.9
Wilson 1964-66	5	17.38
Wilson 1966-70	23	50.49
Heath 1970-74	12	44.36
Wilson 1974	3	7.18
Wilson 1974-76	15	17.77
Callaghan 1976-79	12	36.82
Thatcher 1979-83	21	49.05
Thatcher 1983-87	17	47.93
Thatcher 1987-90	16	41.48
Major 1990-92	4	16.26
Major 1992-97	33	60.62
Total	225	619.32

Notes: See Table 1 for the definition of variables.

Table 4: Average Tenure and Characteristics of Ministers by Ministerial Rank

	Ministerial rank							
	Cabinet Ministers		Ministers of Cabinet rank		Junior Ministers		Whips and Members of HM Household	
Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Observed Tenure	27.96	16.75	27.21	16.64	26.84	16.00	25.55	16.77
Individual calls for resignation	0.14	0.35	0.03	0.16	0.03	0.16	0.01	0.08
Cumulative government resignation calls	0.89	0.77	1.57	2.84	2.50	4.50	4.18	6.33
Public School	0.70		0.66		0.60		0.55	
Oxbridge	0.62		0.53		0.46		0.41	
Age	55.37	7.36	50.81	7.66	46.15	7.91	47.03	9.71
Some experience	0.92		0.74		0.49		0.38	
Resignation calls in the past	0.25		0.05		0.01		0.00	
Female	0.03		0.04		0.06		0.05	
Noble	0.19		0.25		0.11		0.34	
Observations	356		667		792		415	

Notes: See Table 1 for the definition of variables.

Table 5: The impact of Individual Calls for Resignation on Ministerial Durations. Hazard Ratios from Cox Models.

Variables	(1)	(2)	(3)	(4)
First individual call for resignation	2.519***	2.556***	2.569***	2.489***
	[0.400]	[0.407]	[0.409]	[0.398]
Second individual call for resignation	10.049***	9.518***	9.924***	10.095***
	[2.187]	[2.084]	[2.193]	[2.232]
Third or higher individual call for resignation	4.634***	4.820***	4.974***	4.993***
	[2.119]	[2.218]	[2.299]	[2.313]
Public School	1.267**	1.141	1.088	1.094
	[0.143]	[0.143]	[0.138]	[0.139]
Oxbridge	0.793**	0.786**	0.798**	0.795**
	[0.085]	[0.084]	[0.085]	[0.085]
Age	1.042***	1.045***	1.044***	1.043***
	[0.006]	[0.006]	[0.006]	[0.006]
Female	0.704	0.654*	0.686	0.685
	[0.173]	[0.161]	[0.171]	[0.170]
Some experience	1.451***	1.291**	1.368**	1.472***
	[0.162]	[0.152]	[0.171]	[0.192]
Resignation calls in the past	0.793	0.830	0.796	0.798
	[0.162]	[0.170]	[0.163]	[0.163]
Noble	1.011	1.003	0.980	0.977
	[0.120]	[0.120]	[0.117]	[0.117]
Ministers of Cabinet rank	1.724***	1.700***	1.716***	1.717***
	[0.255]	[0.252]	[0.253]	[0.253]
Junior Ministers	2.311***	2.212***	2.243***	2.271***
	[0.369]	[0.355]	[0.360]	[0.365]
Whips and Members of HM Household	3.617***	3.396***	3.654***	3.713***
	[0.670]	[0.633]	[0.684]	[0.697]
Majority		0.985	0.976	
		[0.013]	[0.018]	
Labour		0.824		
		[0.100]		
Second Term		1.345***	1.360**	
		[0.145]	[0.189]	
Third Term		1.536**	2.200***	
		[0.283]	[0.475]	
Prime Minister fixed effects	No	No	Yes	No
Prime Minister x Term fixed effects	No	No	No	Yes
Observations	25,572	25,572	25,572	25,572

Notes: Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1% . See Table 1 for the definition of variables.

Table 6: The impact of Individual and Government Calls for Resignation on Ministerial Tenure. Hazard Ratios from Cox Models.

Variables	(1)	(2)	(3)	(4)
First individual call for resignation	2.462***	2.468***	2.461***	2.406***
	[0.391]	[0.392]	[0.393]	[0.385]
Second individual call for resignation	10.551***	9.646***	9.922***	10.230***
	[2.279]	[2.091]	[2.176]	[2.252]
Third or higher individual call for resignation	5.354***	5.391***	5.283***	5.248***
	[2.458]	[2.482]	[2.441]	[2.431]
Cumulative government resignation calls	0.964***	0.932***	0.922***	0.908***
	[0.009]	[0.010]	[0.012]	[0.014]
Public School	1.234*	1.126	1.095	1.095
	[0.140]	[0.143]	[0.139]	[0.140]
Oxbridge	0.797**	0.791**	0.801**	0.800**
	[0.086]	[0.085]	[0.086]	[0.086]
Age	1.042***	1.045***	1.044***	1.044***
	[0.006]	[0.006]	[0.006]	[0.006]
Female	0.762	0.719	0.714	0.710
	[0.187]	[0.178]	[0.178]	[0.177]
Some experience	1.517***	1.185	1.231	1.184
	[0.170]	[0.143]	[0.157]	[0.158]
Resignation calls in the past	0.765	0.797	0.798	0.808
	[0.155]	[0.161]	[0.163]	[0.165]
Noble	1.002	0.977	0.979	0.995
	[0.119]	[0.116]	[0.117]	[0.118]
Ministers of Cabinet rank	1.728***	1.681***	1.689***	1.682***
	[0.253]	[0.245]	[0.246]	[0.246]
Junior Ministers	2.371***	2.207***	2.257***	2.240***
	[0.377]	[0.350]	[0.360]	[0.358]
Whips and Members of HM Household	3.891***	3.640***	3.788***	3.741***
	[0.719]	[0.671]	[0.703]	[0.695]
Majority		0.957***	0.940***	
		[0.013]	[0.018]	
Labour		0.931		
		[0.117]		
Second Term		2.105***	1.967***	
		[0.271]	[0.309]	
Third Term		2.243***	2.623***	
		[0.441]	[0.577]	
Prime Minister fixed effects	No	No	Yes	No
Prime Minister x Term fixed effects	No	No	No	Yes
Observations	25,572	25,572	25,572	25,572

Notes: Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1% . See Table 1 for the definition of variables.

Table 7: The impact of Individual, Government Calls for Resignation, and their interaction on Ministerial Tenure. Hazard Ratios from Cox Models.

Variables	(1)	(2)	(3)	(4)
First individual call for resignation	1.333	1.335	1.370	1.320
	[0.364]	[0.368]	[0.378]	[0.366]
Second individual call for resignation	11.329***	9.305***	10.013***	10.746***
	[4.505]	[3.682]	[3.964]	[4.281]
Third or higher individual call for resignation	6.978	4.187	4.334	4.439
	[8.421]	[5.075]	[5.205]	[5.263]
Cumulative government resignation calls	0.957***	0.924***	0.916***	0.903***
	[0.010]	[0.011]	[0.013]	[0.014]
First individual call X Cumulative government calls	1.066***	1.066***	1.062***	1.064***
	[0.022]	[0.022]	[0.022]	[0.022]
Second individual call X Cumulative government call	0.995	1.004	1.000	0.997
	[0.031]	[0.031]	[0.030]	[0.030]
Third individual call X Cumulative government calls	0.985	1.022	1.018	1.015
	[0.078]	[0.081]	[0.080]	[0.078]
Public School	1.224*	1.113	1.082	1.081
	[0.139]	[0.142]	[0.138]	[0.138]
Oxbridge	0.786**	0.780**	0.793**	0.791**
	[0.085]	[0.084]	[0.085]	[0.085]
Age	1.042***	1.046***	1.044***	1.044***
	[0.006]	[0.006]	[0.006]	[0.006]
Female	0.753	0.715	0.710	0.705
	[0.185]	[0.177]	[0.177]	[0.175]
Some experience	1.520***	1.187	1.236*	1.193
	[0.171]	[0.143]	[0.158]	[0.160]
Resignation calls in the past	0.776	0.809	0.806	0.817
	[0.158]	[0.164]	[0.164]	[0.167]
Noble	1.017	0.996	0.995	1.010
	[0.120]	[0.118]	[0.118]	[0.120]
Ministers of Cabinet rank	1.692***	1.640***	1.645***	1.636***
	[0.247]	[0.240]	[0.241]	[0.240]
Junior Ministers	2.372***	2.200***	2.247***	2.230***
	[0.378]	[0.351]	[0.360]	[0.358]
Whips and Members of HM Household	3.843***	3.582***	3.724***	3.675***
	[0.710]	[0.661]	[0.692]	[0.684]
Majority		0.958***	0.941***	
		[0.013]	[0.018]	
Labour		0.922		
		[0.116]		
Second Term		2.098***	1.961***	
		[0.272]	[0.308]	
Third Term		2.245***	2.613***	
		[0.442]	[0.575]	
Prime Minister fixed effects	No	No	Yes	No
Prime Minister x Term fixed effects	No	No	No	Yes
Observations	25,572	25,572	25,572	25,572

Notes: Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1% . See Table 1 for the definition of variables.

Table 8: The impact of Individual, Government Calls for Resignation, and their interaction on Ministerial Tenure by Number of Months in Office and Two Eras (1945-1970, 1970-1997). Hazard Ratios from Cox Models.

Variables	(1)	(2)	(3)	(4)
First individual call for resignation	0.576	0.790	1.367	1.195
	[0.318]	[0.263]	[0.506]	[0.511]
Second individual call for resignation	13.739***	4.769***	8.479***	15.976***
	[12.414]	[2.225]	[5.570]	[8.486]
Third or higher individual call for resignation	708.347	2.932	0.004	118.706***
	[3,384.695]	[3.714]	[0.025]	[176.498]
Cumulative government resignation calls	0.488***	0.757***	0.776***	0.936***
	[0.037]	[0.023]	[0.027]	[0.018]
First individual call X Cumulative government calls	1.427***	1.153***	1.065*	1.080***
	[0.128]	[0.040]	[0.038]	[0.030]
Second individual call X Cumulative government cal	1.097	1.123***	0.963	1.006
	[0.154]	[0.050]	[0.068]	[0.036]
Third individual call X Cumulative government calls	0.522	1.113	1.473	0.838
	[0.405]	[0.107]	[0.401]	[0.113]
Public School	1.351	1.041	1.085	1.091
	[0.291]	[0.155]	[0.211]	[0.192]
Oxbridge	0.873	0.816	0.964	0.694**
	[0.158]	[0.103]	[0.163]	[0.101]
Age	1.052***	1.039***	1.054***	1.031***
	[0.010]	[0.007]	[0.010]	[0.009]
Female	1.010	0.901	0.962	0.541*
	[0.377]	[0.246]	[0.356]	[0.185]
Some experience	1.236	1.290	1.172	1.110
	[0.302]	[0.208]	[0.240]	[0.201]
Resignation calls in the past	0.856	0.833	0.579*	1.574*
	[0.282]	[0.181]	[0.185]	[0.432]
Noble	1.075	1.096	0.804	1.340*
	[0.202]	[0.149]	[0.143]	[0.223]
Ministers of Cabinet rank	2.084***	1.350*	1.443*	2.168***
	[0.529]	[0.221]	[0.296]	[0.483]
Junior Ministers	2.205***	1.646***	2.103***	2.594***
	[0.617]	[0.296]	[0.464]	[0.628]
Whips and Members of HM Household	5.054***	2.983***	3.287***	4.731***
	[1.530]	[0.615]	[0.893]	[1.273]
Prime Minister x Term fixed effects	Yes	Yes	Yes	Yes
Observations	10,600	20,525	10,008	15,564

Notes: Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1% . See Table 1 for the definition of variables. Column 1 is estimated up to the first 18 months of government only and column 2 is estimated up to to 36 months in office. Column 3 is estimated with those governments between 1945 to 1970 (including Wilson 1966-70) and Column 4 is estimated with those in government from 1970 to 1997 (starting with Heath 1970-74).

Figure 1: Cumulative Resignation Calls by Government 1945-1997

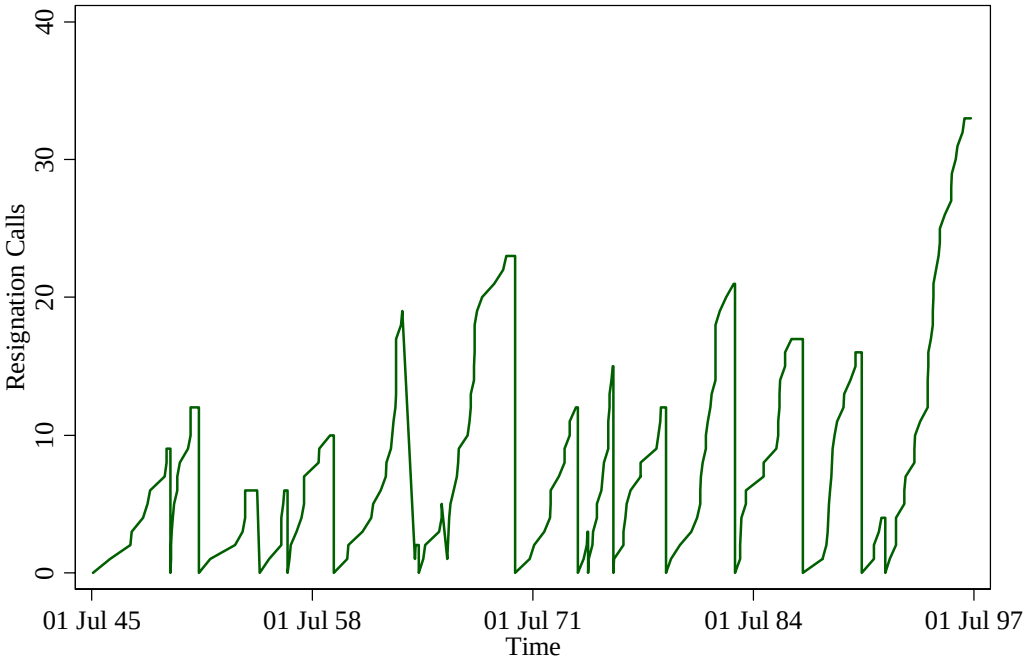


Figure 2: Survivor Function for Ministerial Resignation Calls 1945-1997

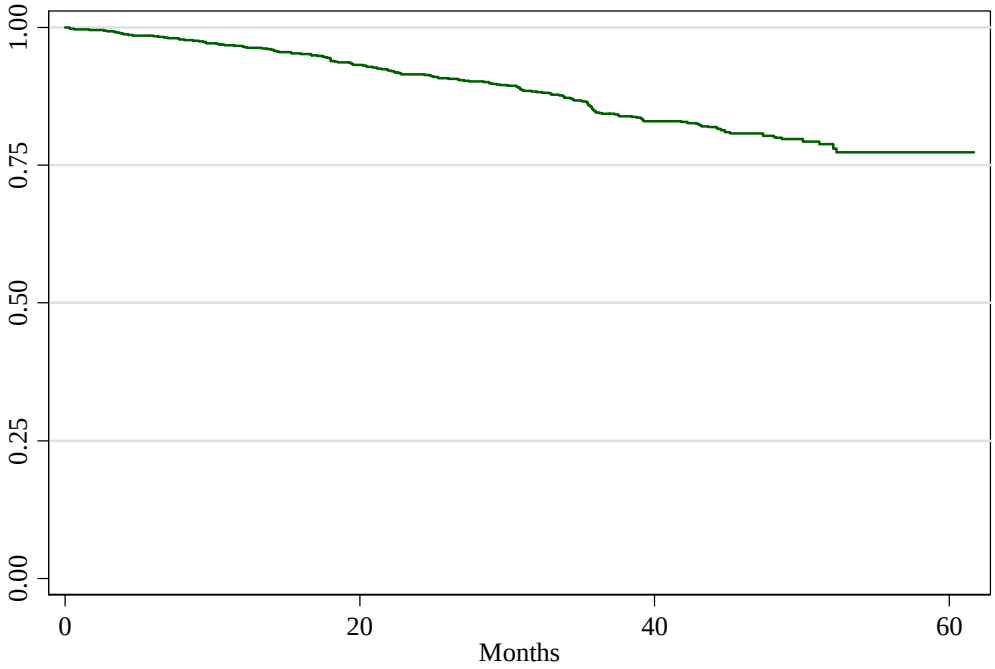
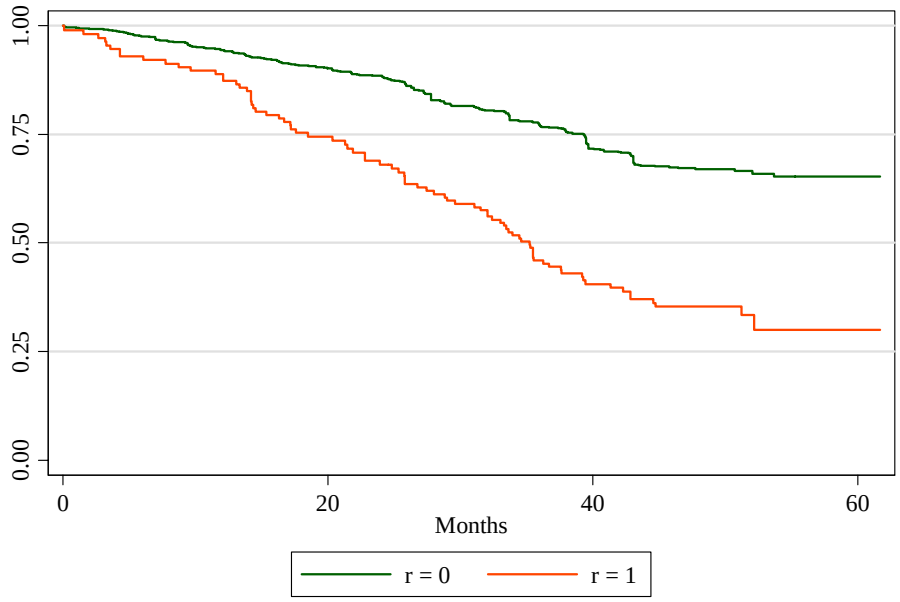
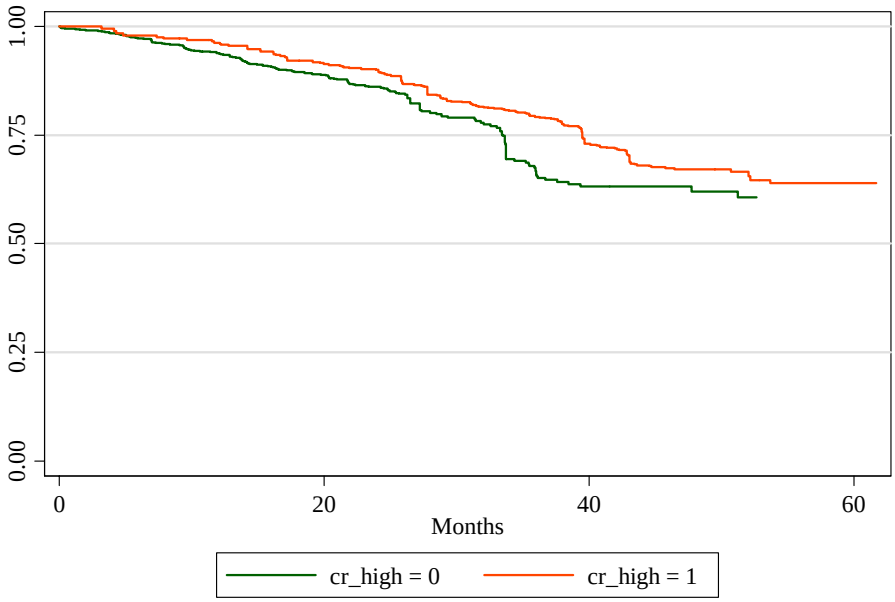


Figure 3. Survivor Function for Ministerial Duration by Individual Resignation Calls



Notes: r=1 when one or more individual resignation calls have been received and 0 otherwise.

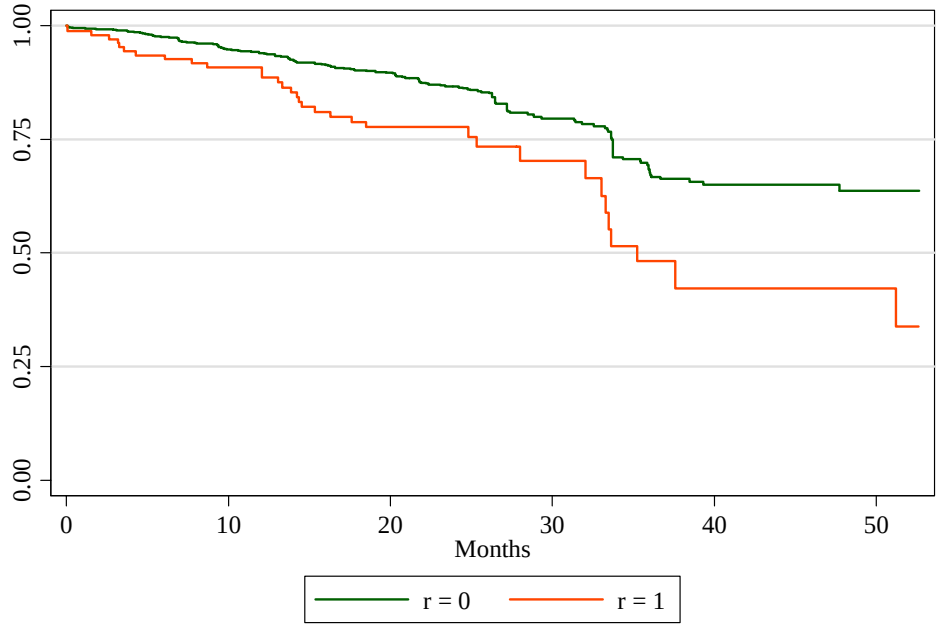
Figure 4. Survivor Function for Ministerial Duration by Cumulative Number of Government Resignation Calls Below or Above the Median



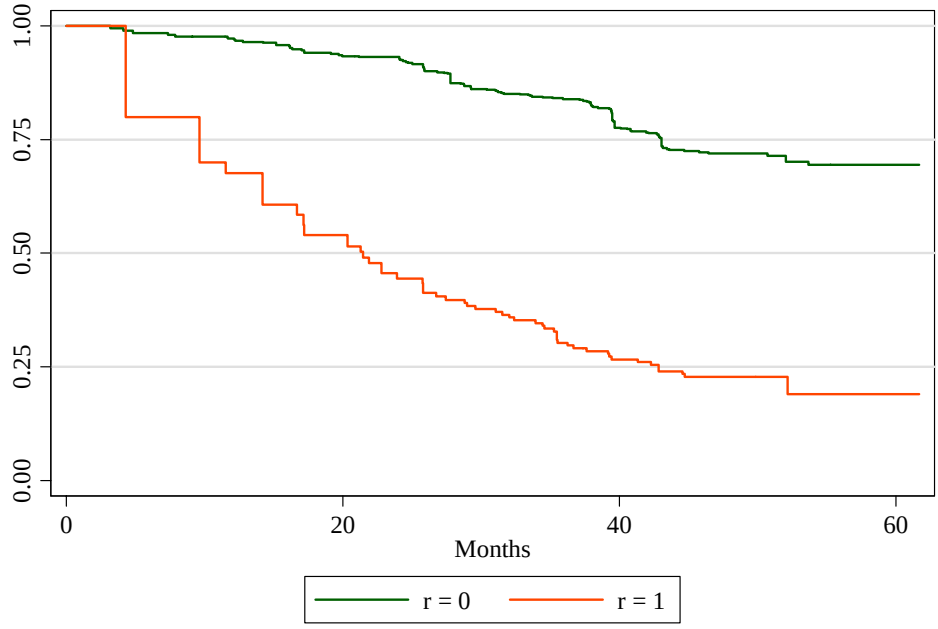
Notes: The median number of resignation calls is 8. cr_high=1 if the number of cumulative government resignation calls is bigger than the median and 0 otherwise.

Figure 5. Survivor Function by Individual Resignation Calls

a. Governments with less than the median number of cumulative resignation calls



b. Governments with more than the median number of cumulative resignation calls



Notes: r=1 when one or more individual resignation calls have been received and 0 otherwise. The median number of cumulative government resignation calls is 8.