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TENURE HISTORIES:
THE ITALIAN CASE***

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Abstract

The issue of assessing the determinants of political stability and the interactions between political and economic factors have long been of great interest both to political scientists and economists. In this paper we propose and estimate a duration model of the Italian government and we test a number of different hypotheses about the causes of the observed cabinet turnover pattern. The flexible form of the hazard function we propose for such an analysis possesses some desirable features and seems to be appropriate for such a type of investigation. The main implication of this paper is that the downfall probability of an Italian cabinet is determined both by political and economic factors. The major determinants of cabinet durability are the duration of the crisis preceding a government's formation, the time horizon to the next election and economic issues such as inflation dynamics and tensions in the labor market.

1. Introduction

The issue of how long a cabinet remains in power in parliamentary regimes has long been of great interest to political scientists. Starting with Lowell (1896), many theoretical explanations of the process of government formation and dissolution and empirical analyses of the causes of government (in)stability have been proposed. Economists, on the other hand, have started wondering about the interaction of economic and political factors since the appearance in 1975 of the seminal work by Nordhaus on the "Political Business Cycle" (PBC). The emphasis is on the causal relationship that goes from the political cycle to the business cycle, in the effort of detecting the mechanisms that link economic fluctuations to political events (in particular, elections).

In this paper we try to achieve a twofold objective. The main task of the paper is to understand the dynamics of the government tenure process and provide some useful instruments of analysis for this purpose. The second, more specific, aim is to test for the presence of a feed-back of the economic outcomes on the political cycle which goes in the opposite direction of the causation predicted by PBC theories. The case study for the empirical analysis is the history of the Italian government, whose characteristics best seem to fit such an investigation. A natural continuation of this paper would imply the extension of the framework presented here to a pool of similar modern parliamentary systems.

The focus of the analysis is on developing different model specifications for the study of the government turnover process in the Italian political system. There are three main empirical results of our analysis. First, the estimates of a 'simple' model with no explanatory variables suggest that the longer an Italian government stays in power, the higher the probability it falls from power. Second, in a 'quasi-conventional' political-only specification of our model all the variables selected to explain the durability of the Italian government have the expected effect on a cabinet's survival probability and four of them -- namely, the duration of the crisis preceding a cabinet's formation, the time horizon which separates a government from the next scheduled election, the majority status of a government and a dummy variable accounting for early elections -- are significant at conventional levels of confidence. Third, in an 'extended' specification of our model

selected economic variables -- such as the inflation rate and number of hours of strike -- are seen to have a positive significant effect on the downfall probability of Italian cabinets.

The paper is organized as follows. In Section 2 we review the literature on cabinet duration. Section 3 presents the case study of our empirical analysis. In Section 4 we describe the econometric model we use to obtain the results presented in Section 6. Section 5 contains a description of the explanatory variables used in the empirical analysis. Conclusions and comments occupy Section 7.

2. A review of the literature

Cabinet durability is viewed by political scientists as a good proxy for the effectiveness of a government and the stability of a democratic regime¹. Contemporary research on government (in)stability has therefore proceeded with empirical assessments of a variety of hypotheses about the determinants of cabinet durability. Structural differences in the fundamental working hypothesis allow to distinguish, within these investigations, two distinct approaches: the 'traditional approach' and the 'events approach'.

The traditional approach² mainly focuses upon relating specific attributes of political actors and parliamentary settings with the duration of cabinets over time. Defining the dependent variable as the duration of cabinets in power -- i.e., the number of days, weeks or months that cabinets endure as governments³ -- a set of exogenous variables,

¹ An alternative interpretation offered by Lijphart (1984a) is that cabinet durability is important because it reflects executive dominance in executive-legislative relationships, in the sense that "a cabinet that stays in power for a long time is likely to be dominant vis-a-vis the legislature, and a short-lived cabinet is likely to be weak and dominated by its legislature" (p. 165). In this paper, we will no longer discuss this issue. The interested reader is referred to Dowding and Kimber (1983), Lijphart (1984a) and Sanders and Herman (1977). Ersson and Lane (1983) introduce a global concept of political stability that keeps into account the interaction between economic, social and political factors.

² See for example, Blondel (1968), Taylor and Herman (1971), Hurwitz (1972), Dodd (1976), Sanders and Herman (1977), Warwick (1979) and Strom (1984, 1985).

drawn mostly from the considerable prior theoretical research⁴, are proposed as explanatory factors and multivariate regression techniques are used. Measures relating to the degree of multipartitism, majority government status, single-party cabinet status, various party-system stability measures, minimal-winning coalition status, electoral salience and measures of ideological polarization or 'cleavage conflict' among parties are among the most frequently used explanatory variables. All such variables however, are constant over the life of a cabinet (and in some cases also over the life of a parliament), and thus can only partially account for the dynamics of the government dissolution process.

The fundamental working hypothesis of the traditional approach -- i.e., that the duration of a government (and then its dissolution) is predetermined by conditions existing at the time of its formation, and independent of the nature of the events arising in its decision-making environment during its lifetime -- has then stimulated criticism and further investigation. It seems in fact reasonable that the variation in the type of events confronting a cabinet day by day might have a significant impact on its survival probability. The events approach⁵ suggests that a major component of a sensible model of cabinet stability should be stochastic in that the process of government collapse should be described as a stochastic process. Events, unlike fixed characteristics of the decision-making environment of a cabinet, are therefore conceived as realizations of random shocks which repeatedly challenge the inherent stability of a cabinet and eventually bring it to an end.

³ Of course, the crucial element in the definition of this variable is the type of events that mark the beginning and the end of a cabinet. We will discuss this particularly controversial issue later on.

⁴ Two intellectual traditions have structured the research on cabinet durability in the past: the first focused upon the political institutions and mechanisms of democratic government, the second associated with the development of rational choice theories of coalition behavior. For a review of early theoretical work on cabinet durability see Browne et al. (1984).

⁵ See, for example, Browne et al. (1984, 1986), Frensdreis et al. (1986) Cioffi-Revilla (1984) and Midlarsky (1984).

The instruments of survival analysis are used to provide this general intuition with an empirical content. A weakness of such analyses, however, is the a-priori assumption that the end of a cabinet is unaffected by its prior experience, for the probability that a cabinet end at any point in time is assumed to be the same regardless of the length of time it has remained in power. In other words, the events approach is based on the assumption that the rate of arrival of the events that determine a cabinet's dissolution follows a Poisson process. This in turn implies that the marginal distribution of cabinet durations is exponential, so that the corresponding hazard rate is constant over time. We will discuss these concepts in more depth in Section 4. Another source of weakness to the events approach derives from the fact that no covariates are introduced into the analysis and hence the inference is restricted to the unconditional distribution of government durations.

The academic controversy between these two approaches was recently brought into open debate by Strom (1988) on one side and Browne et al. (1988) on the other side. This apparently irreconcilable dispute over the appropriate framework for the study of parliamentary cabinets duration has then stimulated the work by King et al. (1990), who attempted to combine the insights of these (up until now) distinct approaches into a "theoretically and statistically unified model that can be used to explore the impact of particular attributes upon cabinet durability, while maintaining the assumption that the duration of any particular cabinet will ultimately be determined by a stochastic process, such as the random incidence of terminal events" (p. 847). King et al. (1990) also control in their model for the incidence of scheduled elections as a right-censoring mechanism.

In this paper we pursue this new direction of research and propose a new framework to look at government tenure histories. In particular, our study extends previous work in four important respects. First, we propose and estimate a flexible functional form for the cabinet duration process which allows us to test for the presence of various forms of duration and time dependence. Second, our model offers a more satisfactory way of

handling right-censored government spells because of scheduled elections and dealing with the presence of a maximum constitutional interelection period. Third, in addition to some of the variables already identified as important in explaining cabinet duration by previous theoretical and empirical studies, we propose new variables some of which are aimed to capture the peculiarities of the political system under study. Fourth, we include among the regressors time-varying covariates and, in particular, economic variables. Economic issues are in fact among the constant and salient events that confront governments. Hence, an analysis of the determinants of the government turnover process cannot avoid to deal with this issue. The idea behind this hypothesized causal relationship that goes from the business cycle to the political cycle is that variations in economic outcomes -- such as the inflation rate, the unemployment rate, GNP growth rate and conflicts in the labor market -- may generate considerable pressure on cabinets. Constituting elements of the 'demand structure' of society, these economic factors are expected to determine the agenda of the governments and the level of stress under which they operate and eventually, contribute to bring them to an end. This idea, certainly not new, has received considerable attention over the past 20 years, but mainly with respect to the issue of assessing the impact of key economic variables on voting behavior and electoral outcomes⁶. The other side of the interaction between economic and political factors has also been widely investigated by the PBC theorists. Essentially, all the contributions originating from the 'opportunistic' political business cycle theory [Nordhaus (1975) and MacRae (1977)] as well as the 'partisan' theory of the business cycle [Hibbs (1977)]⁷, focus upon relating fluctuations in

⁶ For early references see, for example, Kramer (1971), Fair (1979) and Hibbs (1979). With respect to the Italian case see Santagata (1985). Robertson (1983a, 1983b) instead, focuses his study upon relating inflation and unemployment with the collapse of incumbent governments. The frameworks he uses however -- namely, a Poisson model in Robertson (1983a) and a multivariate regression in Robertson (1983b) -- do not allow him to handle the economic variables properly (i.e., as time-varying variables) and are plagued by problems we discuss in this paper.

⁷ For excellent surveys of recent contributions on the argument see Alesina (1988) and Nordhaus (1989) and for an empirical assessment of the various PBC theories for the

economic aggregates to macroeconomic policies of differently motivated governments, whose existence is threatened by the presence of scheduled elections. These theories however, do not allow in their models political fluctuations within legislatures -- or better, are designed for political systems where this possibility is ruled out. Hence, it is implicitly assumed that once a government wins an election it can carry over its policy until the time of the next election comes. What we try to detect here is the existence of a feedback of the state of the economy on the lifetime of governments, when government turnover within legislatures is possible. Using as explanatory variables in the model economic covariates, we introduce an assumption of exogeneity of the economic pattern in the sense that we condition our analysis on the path followed by the economic system. Our analysis is therefore as partial as the PBC theories are for they condition on the exogeneity of the political cycle. Over the long term the simultaneity problem must be addressed systematically and a general model of the interaction of economic and political factors in multiparty parliamentary regimes proposed.

3. The case study

In this paper we propose and estimate a duration model for the Italian government⁸. Among modern multiparty parliamentary systems Italy is probably best known for the succession of remarkably short-lived cabinets which characterize its political system. Unlike other similar political regimes, the average duration of postwar Italian cabinets (352 days) is in fact considerably shorter than the parliamentary term (five years). Hence, a large number of cabinets per legislature (3.9 on average over the nine so far

OECD countries see Alesina and Roubini (1990). For a slightly different way of looking at the same problem see Van Winden et al. (1987).

⁸ For an events approach to the same topic see Cioffi-Revilla (1984).

completed legislatures) is a distinctive feature of the Italian political system⁹. However, in spite of this well-established empirical feature and although comparative research on the causes of government durability in modern parliamentary regimes continues to yield new insights and theories, the dynamics of the process of cabinet decay in Italy are still largely incomprehensible, thus motivating the interest of our study¹⁰.

The history of the Italian government can be usefully described as a realization of a two-state alternating (conditional) renewal process, in the terminology of stochastic processes theory¹¹. At any given time in fact, either a cabinet is in power and enjoys political support in parliament or, if the parliament withdraws its support to the incumbent government (even because of a mandatory election), such a government is politically dead and a period of crisis initiates in which the political actors bargain upon a new agreement¹². When such an agreement is reached a new government is inaugurated. The resulting process can be described by the function

$$G(t) = \begin{cases} 1 & \text{if a government is in power at time } t \\ 2 & \text{if a political crisis is in progress at time } t \end{cases}$$

so that the history of the Italian government can be represented as in Figure 1. The focus of this study is on exit times from government status and hence on the transition probability to a crisis¹³.

⁹ For comparisons with other political systems see, for example, Blondel (1968) Hurwitz (1971, 1972) and Laver and Schofield (1990).

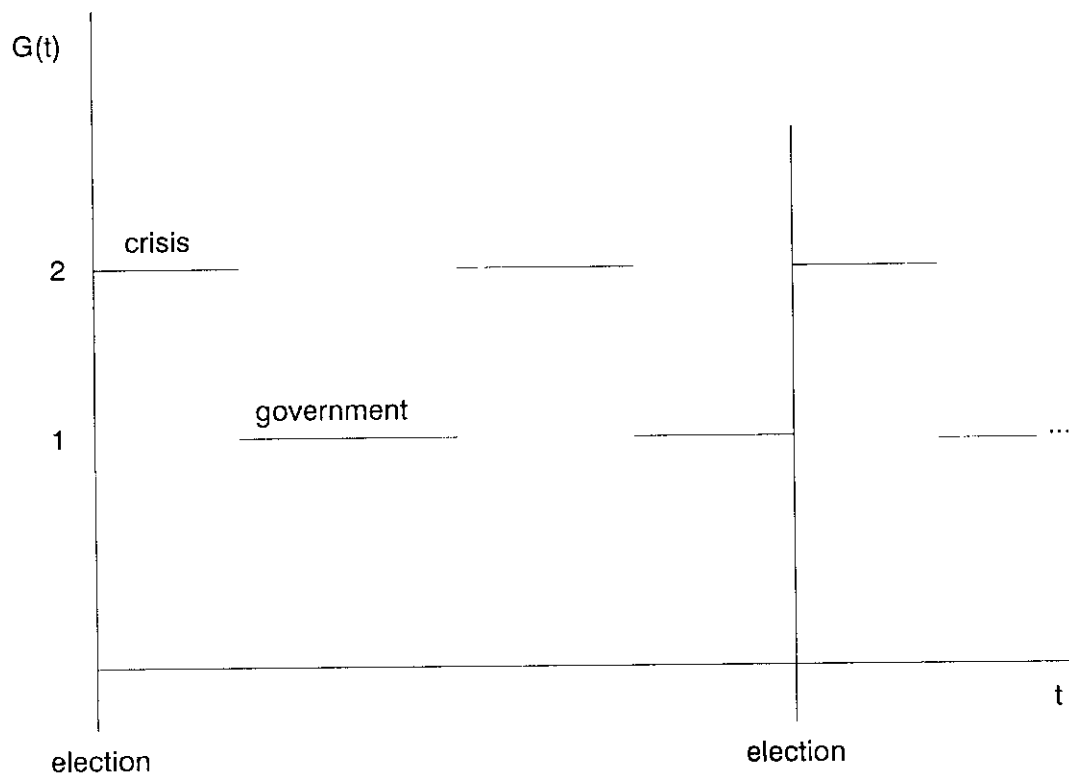
¹⁰ For a detailed description of the Italian political system see, for example, Lange and Tarrow (1980), Mershon (1990), Pasquino (1985) and Pridham (1981). A brief description of the Italian political system ancillary to our study is contained in Appendix 1.

¹¹ For reference see, for example, Cox (1962) and Cox and Isham (1980).

¹² Mershon (1990) contains an interesting discussion about the difference between institutional rules and behavioral regularities in government formation in the Italian political system.

¹³ An analysis of the determinants of the transition probability from crisis status is

Figure 1 - AN ALTERNATING RENEWAL PROCESS



As previously noted, the crucial element in defining the lifetime of a cabinet -- our dependent variable of interest here -- is to identify the events that mark its beginning and end. Following Sanders and Herman (1977), we choose to define these events in the same way as they are perceived within the Italian political system. The process of collapse and reconstitution of Italian governments is well monitored and documented. Operationally, the initial time in which a cabinet begins to rule is defined as the day in which the prime minister-designate and his cabinet swear loyalty to the Republic before the President. The final day of this rule is, instead, defined as the one in which the prime minister resigns, even though the cabinet may be succeeded by a cabinet headed by the same prime minister and with the same party composition¹⁴. The interval of time between these two events defines a completed government spell. The occurrence of a scheduled election determines, instead, the truncation time of a right-censored government spell. The existence of scheduled elections, established by the expiration of the parliamentary term, defines the limits within which government dissolution is certain, even if the existing government is still healthy. For this reason, we treat government spells ending with a scheduled election as right-censored spells and not as completed spells. Right-censoring -- although of a different type -- occurs for the last government in our sample as well. Given that the beginning of the observation interval is also the initial entry date of a

contained in Merlo (1991a). Although this point will be more clear after Section 4, note that we assume here that there is no simultaneity with respect to unobserved heterogeneity. Hence, the likelihood function partitions into two distinct components, so that the two problems -- namely, the transition from a government to a crisis and from a crisis to a government -- can be studied separately.

¹⁴ As we already noted, the issue of defining the events that uniquely identify the duration of a cabinet is highly controversial (see for example Strom (1985)). Seven different such events have been proposed in the major studies of cabinet durability; for a discussion of the relative advantages and disadvantages connected with the use of one or a combination of such concepts as a criterion to obtain an operational definition of cabinet duration see Lijphart (1984b). We are aware of the fact that a different definition of the dependent variable might lead to different results.

government in power, left-censoring is not a problem for our analysis. The time frame of our study extends from the fifth De Gasperi government (the first cabinet of the first legislature which starts ruling on May 23, 1948) to the sixth Andreotti government (in power since July 27, 1989 and still ruling in July 31, 1990, the ending point of our sampling period), for a total of 44 governments. For the purpose of this study however, we also require that in order for a government to be included in our sample it must obtain the prescribed vote of confidence by both chambers of the parliament within ten days of its inauguration. If a government fails on either vote, it must resign and although, as noted by Mershon (1990), "a demission at this stage does not annul the government's official status" (p. 12), the occurrence of such an event characterizes what in political jargon is called a 'born dead' government -- i.e., a government which in fact never has the power of ruling. These governments are therefore 'special' in that they can not be treated as the others, especially when looking for some regularities in the cabinet turnover process. The exclusion of the born dead governments reduces the sample size to 39 governments¹⁵.

Two final remarks deserve to be made. First, although in the political system we consider there exists the theoretical possibility of calling early elections -- where by this we mean elections called before the end of the constitutional interelection period -- and this option has been experienced in the time span covered by our study, we do not consider this fact as a signal of the presence of an endogenous mechanism of right-censoring. Rather, we treat early elections in a different way from the scheduled ones. In other words, even though there might be reasons to think that the censoring mechanism is not independent of the structural process generating government duration data¹⁶ we keep

¹⁵ The 5 born dead Italian governments are the fifth De Gasperi (July 1953), the first Fanfani (January 1954), the first Andreotti (February 1972), the fifth Andreotti (March 1979) and the sixth Fanfani (April 1987).

¹⁶ The policymakers might be strategic in choosing the timing of elections. As noted by Ito (1990), for example, early elections might be called to capitalize on good economic conditions. Alesina and Roubini (1990) however, although in the context of a different model, test and reject such a hypothesis for Italy. For a test of Ito's theory in

the assumption that the censoring mechanism is indeed independent¹⁷ and treat the occurrence of an early election as an exceptional event determining the end of a legislature¹⁸. Second, if we consider that no Italian government ever survived as long as a legislature did, that the effectiveness of the policy of a government depends on how long that government endures, and that the monetary policy in Italy is not directly controlled by the government¹⁹, the hypothesis of conditioning political fluctuations on economic outcomes can not be rejected out of hand.

4. The econometric model

In this paper, we apply the econometric methods presented by Flinn and Heckman (1982) for the empirical analysis of individual labor market histories to the empirical analysis of government tenure histories. The flexible functional form implied by this approach allows us to avoid strong assumptions about specific functional forms that are not suggested by the data nor can be justified by an appeal to the theory. The techniques used here allow us to extend previous work in the field in two major ways: time-varying explanatory variables are introduced into the analysis and tests for the presence of different types of time and duration dependence are obtained. Moreover, the likelihood approach adopted here avoids two well-documented major problems that trouble the regression

the context of our model see footnote 39.

¹⁷ Note that in order to be able to identify any model of cabinet duration we either need independence or complete knowledge of the exact form of dependence, if such a dependence exists. On this point see Berman (1963). David and Moeschberger (1978) and Kalbfleish and Prentice (1980) also discuss this issue.

¹⁸ Note that the act of calling an early election, which is done by the President of the Republic, occurs after a government failure and a subsequent acknowledged impossibility of forming a government coalition able to gather the necessary support in parliament.

¹⁹ In Italy in fact (at least after the so-called "divorce" in 1981), a considerable degree of independence is granted to the Central Bank. On this point see, for example, Bade and Parkin (1985).

approach when dealing with duration data and that are relevant for our analysis. The first problem is that the regression approach can not be readily adopted when dealing with time-varying explanatory variables. The second problem is that least-squares estimators are ill-equipped to deal with censored spells of events²⁰.

Using the standard notation in survival analysis²¹, we let T denote the failure time or the lifetime of a government and $F(t)$ denote the distribution function of T with density $f(t)$. For the moment, we ignore any dependence of this distribution on exogenous components. The survival function, $S(t)$, is

$$S(t) = 1 - F(t) = P\{T > t\}.$$

The hazard function, $h(t)$, is defined as the conditional density of exit time from a government spell given the length of time spent in the spell, so that

$$h(t) = f(t)/[1 - F(t)] = f(t)/S(t) = P\{t < T < t+dt | T > t\}.$$

It is a well-known result that, given F , h is uniquely determined and vice versa.

Duration dependence is said to exist if $\partial h(t)/\partial t \neq 0$. If $\partial h(t)/\partial t > 0$ duration dependence is positive. In this case, the longer a government has been in power, the more likely it is to fall from power in the next interval of time ($t, t+dt$). If $\partial h(t)/\partial t < 0$ duration dependence is negative. In this case, the longer a government has been in power, the less likely it is to fall in the next small interval of time. The only continuous density

²⁰ Ad hoc solutions to the first problem may induce simultaneous equations bias in the parameter estimates (but see Olsen and Wolpin (1983) for an exception). The commonly used procedure of using only completed spells of events for regression analysis without accounting for this conditioning, induces instead a sample selection bias. For a proof of these arguments and a discussion of these and other related issues see Flinn and Heckman (1982) and Heckman and Borjas (1980).

²¹ For reference see Cox and Oakes (1984), Kalbfleisch and Prentice (1980), or Miller (1981).

of exit times with no duration dependence is the exponential distribution²². To assume a priori an exponential distribution seems, therefore, to be a strong assumption.

The precise functional form of the hazard function is determined by the distribution of the random shocks facing the governments. Typically, specific distributional assumptions are imposed as a matter of mathematical convenience in formulating a theory and are not, in and of themselves, justified by an appeal to the theory. Moreover, a non-parametric analysis of the Italian government duration data -- which is contained in Appendix 2 -- suggests that in light of the non-standard form of the (marginal) empirical distribution function, it would be hazardous to assume a rigid parametric functional form when moving to the multivariate analysis. For these reasons, it is important to minimize the impact of such distributional assumptions. This target can in general be achieved in two ways. One way is to follow a non-parametric approach and estimate a proportional hazard model²³. The other way is to adopt a flexible functional form for the hazard function -- flexible in that it allows to handle various forms of time and duration dependence. In the specific context we are considering there is a main advantage of the latter approach over the former. Even in a discrete-time representation of our continuous-time model, the sample size we work with would not allow us to obtain an estimate of the incidental baseline hazard function -- through general maximum likelihood [Bailey (1984)] rather than partial maximum likelihood [Cox (1972)] techniques -- that is of direct interest here.

²² In fact, if $f(t) = \alpha \exp\{-\alpha t\}$, then $h(t) = \alpha$ and hence $\partial h(t)/\partial t = 0$.

²³ Originally proposed by Cox (1972), the well-known proportional hazard function is of the form

$$h(t|Z) = h_0(t)\exp\{Z(t)\beta\}$$

where $h_0(t)$ is an arbitrary and unspecified (non-parametric) baseline hazard function. Bienen and Van de Walle (1989, 1990) estimate a proportional hazard model for worldwide leadership durations.

The spirit of the analysis here is exploratory. No structural models are proposed and estimated and unobserved heterogeneity is ignored. Given that, the flexible functional form for the hazard function for a single government spell -- after we bring into the analysis explanatory variables which are allowed to vary freely within a spell -- is as follows:

$$[1] \quad h(t|Z, \tau, e) = \exp\{Z(t+\tau)\beta + \sum_{j=1}^J \gamma_j [(t^{\lambda_j} - 1)/\lambda_j] + \delta(e(\tau) - t)\}$$

where $Z(t+\tau)$ is a $1 \times K$ vector of covariates as of calendar time $t+\tau$; β is a $K \times 1$ vector of coefficients; τ is the calendar time at which the spell begins; and $e(\tau)$ is the time distance to the next scheduled election with respect to the calendar time at which the government spell begins. Duration dependence is captured by the term $\sum_{j=1}^J \gamma_j [(t^{\lambda_j} - 1)/\lambda_j]$ ²⁴. The last term, $(e(\tau) - t)$ -- which we might call "time-to-exhaustion" [Moffit (1985)] -- captures the fact that, given that the interelection period is constitutionally determined and fixed²⁵, each cabinet (depending on when within the legislature it begins ruling), faces a different time horizon, and this is supposed to have an influence on the cabinet lifetime. This specification of the hazard is very general and reduces -- setting the appropriate values for the parameters $\lambda_1, \dots, \lambda_J$, $\gamma_1, \dots, \gamma_J$, β and δ -- to the most commonly used hazard functions. In our empirical investigation we adopt either a polynomial specification in tenure with $\lambda_j = j$ and $J \leq 3$ or a logarithmic one with $J=1$ and $\lambda_1=0$. The exponentiation of the right-hand side of [1] guarantees that the hazard function is positive everywhere, as it must be given that $h(t)$ is a conditional density function. Note, however, that in the flexible specification of the hazard function we are working with, nothing guarantees that the underlying distribution function is non-defective²⁶. This fact however, does not imply

²⁴ This treatment of the duration term is clearly analogous to the Box-Cox transformation used in regression analysis [Box and Cox (1964)].

²⁵ Treatment of the problem of early elections will be discussed later.

²⁶ A duration distribution is defective if with positive probability exit never takes

that the maximum likelihood procedure we are using is not well defined, and the properties of consistency and asymptotic normality of the corresponding estimators still hold.

The density function of the exit time of each government is

$$[2a] \quad h(t|Z,\tau,e)\exp\{-\int_0^t h(u|Z,\tau,e)du\}$$

for completed spells, and

$$[2b] \quad \exp\{-\int_0^t h(u|Z,\tau,e)du\}$$

for censored spells, and under the assumption that the observed individual durations are obtained from a random sample of governments, the appropriate log-likelihood is the sum of the log of the individual densities for each government in the sample. Maximizing this function with respect to the parameters β , γ_j ($j=1,\dots,J$) and δ produces maximum likelihood estimators that have been shown [Flinn and Heckman (1982)] to be both consistent and asymptotically normally distributed if the model is correctly specified and as the number of events histories becomes larger. The estimated information matrix can be used to construct valid large sample test statistics for parameter vectors.

5. The data

As already noted, the set of covariates we use in our analysis to explain the process of decay of the Italian government is heterogeneous. In it we can distinguish three distinct groups of variables, which, for simplicity, we label as general political, country-specific political and economic variables.

General political variables are either cabinet or party-system attributes which have been identified as important by earlier theorists for the study of cabinet duration.

place. For the specific case we are considering, a defective duration distribution would imply a positive probability of a government lasting forever.

These variables are expected to account for the effect on a cabinet's durability of its decision-making environment. The specific variables considered in our analysis are the "effective number of parties" [Laakso and Taagepera (1979)] in the political system (which varies across legislatures, but is fixed over each legislature²⁷), the length of the crisis preceding each cabinet's formation and the majority status of each cabinet (captured by a dummy variable which takes the value 1 in correspondence of a majority government and 0 otherwise). The presumption is of course that more stable governments would be associated with a smaller number of parties 'effectively' holding seats in the parliament for it reduces the complexity of the bargaining process, and a majority status for it enlarges the political support to a government in parliament. In contrast, it is a-priori unclear whether a longer crisis should imply reduced cabinet duration. In this respect, we disagree with King et al. for whom "a longer crisis indicates a more difficult bargaining situation in which it is easier for cabinets to collapse, suggesting diminished cabinet duration" (p. 859). We prefer, instead, the interpretation suggested by Strom (1985) for whom "the relationship between crisis duration and government duration may involve an inhibition on early dismissals of

²⁷ This concept is connected to the "fractionalization index" [Rae (1971)] through the relationship

$$N = 1/(1-F)$$

where N denotes the effective number of parties and F the fractionalization index. Both these indexes, which are the two most commonly used measures of the 'effective size' of a multiparty political system, are in turn based on the Herfindahl-Hirschman concentration index [Hirschman (1945)] defined as

$$HH = \sum_i w_i^2$$

where, for our purposes, w_i is the vote (or seat) share obtained by party i in a general election. In particular,

$$N = 1/HH \quad \text{and} \quad F = 1 - HH.$$

What all of these measures try to capture is the degree of complexity of the coalition bargaining process that takes place in multiparty democracies, which is higher in multipolar political systems.

governments formed after lengthy negotiations" (p. 749), on the grounds that the political actors involved in the bargaining process recognize the high costs of dissolving them or, more easily, a lengthy negotiation may clear away the most immediate obstacles to government unity. As we already discussed in Section 4, the potential duration of a government -- i.e., its time distance from the next scheduled election -- also appears as an explanatory variable in our model. The expectation about the direction of the impact of such a covariate on the downfall probability of a government is theoretically unclear. Casual empiricism however, suggests that the vicinity of a scheduled election should keep the government coalition closer in order to allow the government parties to manipulate the electoral event, thus indicating that as the maximum time a government could constitutionally hold office before the expiration of the parliamentary term diminishes its survival probability should increase.

Country-specific political variables are introduced into our analysis to capture the effect of some distinctive features of the Italian political system on the duration of its cabinets. These variables are a dummy variable for early elections (which takes the value 1 if the last election was an early election and 0 if it was instead a scheduled election), the duration of the preceding cabinet, the cumulative length of previous government spells of cabinets run by the same type of coalition and the cumulative length of previous government spells of cabinets headed by the same prime minister. The choice of the last three variables is also aimed to detect the existence of "lagged duration dependence" [Heckman and Borjas (1980)]. The meaning of the early election dummy variable is that of capturing the impact of an early election on cabinet durability. The general expectation is that cabinets following an early election, for they face an additional source of uncertainty²⁸,

²⁸ This uncertainty is about the length of the legislature. Although the theoretical possibility of calling an early election always existed in the Italian political system, it was experienced for the first time only in 1972 and since then it became a rule. Hence, we expect that the threat of an early election is more credible after having experienced one.

should manifest a tendency to last less than cabinets in a legislature originating from a scheduled election. The lagged cabinet duration variable tries to give an empirical content to the idea of duration "contagion" expressed by Strom (1988). Both a positive or a negative impact of such a variable on the probability of collapse of a cabinet may be expected. The inclusion among the explanatory variables of lagged coalition and prime minister durations responds to the need of accounting for a peculiar characteristic of the Italian political system while keeping in the mean time control over the number of covariates²⁹. In spite of its high cabinet turnover rate, the Italian Republic experienced only four different government coalition formulas (or what Mershon (1990) calls "prescriptions for governing alliances"), which succeeded to each other in sequence over the years³⁰ headed by a restricted number of politicians³¹. What we try to pin down is, therefore, a possible impact of the 'experience' levels of such politicians and coalition formulas in their ability to bring (and keep) the various governing alliances together. The expectation is that the more 'tested' a government coalition formula and the more experienced a prime minister the longer a cabinet should last³². Other political variables also recognized as important in explaining government durability by earlier theorists are not included in our data-base for different reasons. One-party governments in Italy have always been minority governments and they almost exhaust the set of minority governments (with only three exceptions). The

²⁹ The alternative being the creation of a dummy variable for each coalition formula and for each prime minister.

³⁰ Namely, centrism from 1948 to 1962, center-left from 1962 to 1976, national solidarity from 1976 to 1979 and "pentapartito" (five-party) from 1979 to the present. For further detail see Appendix 1.

³¹ Only 18 politicians alternated in the role of prime minister since 1948 and 5 of them headed 5 or more cabinets each.

³² Note, however, that the same effect might be produced by unobserved coalition or prime minister specific heterogeneity. Spurious negative duration dependence can in fact be generated by not properly accounting for population heterogeneity.

inclusion among the regressors of this variable or of the number of parties in the government coalition together with the majority government status dummy would therefore, lead to an identification problem. Minimal winning coalition governments represent only a very small fraction of the Italian cabinets (1%), thus making the distinction between minimal winning and surplus coalition governments uninformative. Other variables are simply excluded to keep the number of regressors (and consequently the explanatory power of the model) reasonable. A parsimonious representation of the process being studied is among the important objectives to be achieved in an empirical analysis such as the present one where we work with a sample of limited size and no 'good' structural models are available.

Economic variables form the third group of covariates. They are included in our analysis to test for the presence of a causal effect of economic factors on political fluctuations. The specific economic variables we consider here are the inflation rate and number of hours of strike. The choice of these variables (among the many others that one might want to introduce in such an analysis), although conditioned by the availability of data over the whole time horizon of our study, seems to be appropriate for our analysis. The expectation here is clearly that a higher inflation rate and a higher level of conflict in the labor market (measured by the second variable) should increase a cabinet's risk of collapse.

Data on durations of Italian governments and political crises and elections dates are compiled from Presidenza del Consiglio dei Ministri (1990), Mallory (1948-1970) and Banks (1975-1990). Data on the other political variables are drawn from Mershon (1990). The economic data are monthly observations on inflation and total number of hours of strike (from ISTAT). Inflation is defined as the monthly rate of change of the CPI³³ (from

³³ Namely,

$$\pi_t = [(CPI_t - CPI_{t-1})/CPI_{t-1}] * 100.$$

IMF, IFS). Monthly data are transformed into daily by linear interpolation (inflation) or by imputation to each single day of a fixed proportion of the monthly observation (total number of hours of strike). This operation is necessary in order not to lose any information contained in the government duration data.

Descriptive statistics of all the variables described above are presented in Table 1.

6. The empirical analysis

The maximum likelihood procedures outlined in Section 4 are used here to obtain three sets of empirical results. A 'simple' model with no explanatory variables is first estimated to test for the presence of duration dependence in the Italian government tenure data. Different specifications of the model are compared with respect to the fit they yield. Table 2 shows the results. Figure 2 presents plots of the estimated hazard function based on the different model specifications of Table 2 superimposed to the 'empirical' hazard function (see Appendix 2 for details about its derivation)³⁴. As we can clearly see (Figures 2a and 2b), both a Weibull-like (logarithmic) and a Gompertz-like (linear) specification³⁵ provide a satisfactory fit of the duration data³⁶. The sign of the estimated coefficients (Table 2, Columns (1) and (2)) leads us to conclude that there is evidence of positive duration dependence in the process generating the observed government durations history, thus contradicting the hypothesis of exponentiality³⁷. Higher-order polynomial specifications

³⁴ Note that in order to make the two functions comparable we transformed the estimated hazard function by integrating it over each month.

³⁵ A Weibull-like specification of the hazard function is obtained by setting $\beta=\lambda_1=\gamma_2=\dots=\gamma_J=\delta=0$ in [1], a Gompertz-like by setting $\lambda_1=1$ and $\beta=\gamma_2=\dots=\gamma_J=\delta=0$ in [1].

³⁶ Note that maximum likelihood procedures are seen to perform better for shorter durations. The reason is that maximum likelihood procedures assign low weights to longer durations for which only a few data points are available. Moreover, note that in small samples the accuracy of the non-parametric estimator used to represent the empirical hazard function is also better for shorter durations. On this last point see Kiefer (1988).

³⁷ This result confirms the qualitative conclusions of the non-parametric analysis

TABLE 1

Descriptive statistics of the variables used in the analysis

	<u>Mean</u>	<u>St.dev.</u>	<u>Max.</u>	<u>Min.</u>	<u>Norm.</u>
Tenure (in days)	351.9	218.6	1058	78	/100
Potential Duration* (in days)	1262.8	432.5	1841	371	/1000
Early election dummy (1=early election)	0.4	0.5	1	0	-
Crisis duration (in days)	35.2	28.6	126	7	/10
Effective number of parties	3.9	0.4	4.6	2.9	-
Majority status (1=majority)	0.7	0.5	1	0	-
Lagged cabinet duration (in days)	340.5	209.5	1058	78	/100
Lagged coalition duration (in days)	2061.4	1428.7	4879	0	/1000
Lagged prime minister duration (in days)	482.3	592.1	1996	0	/100
Inflation rate (monthly basis)	0.6	0.8	4.1	-4.8	-
Monthly hours of strike (in thousands)	7464.2	8099.5	73140	37	/1000

* at the beginning of the spell

Figure 2 - HAZARD PLOTS

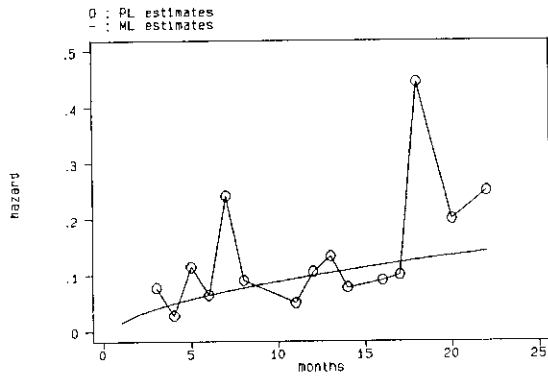


Figure 2a - logarithmic fit

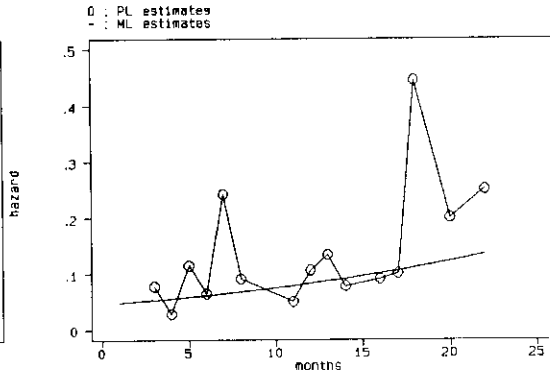


Figure 2b - linear fit

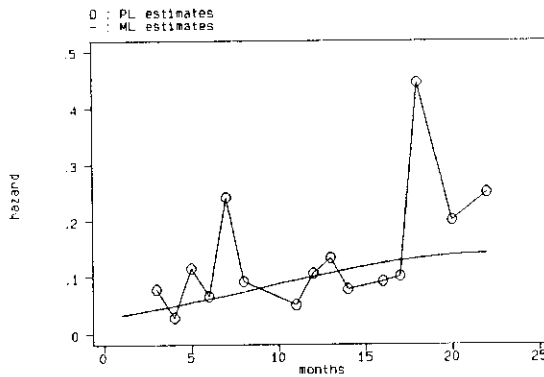


Figure 2c - quadratic fit

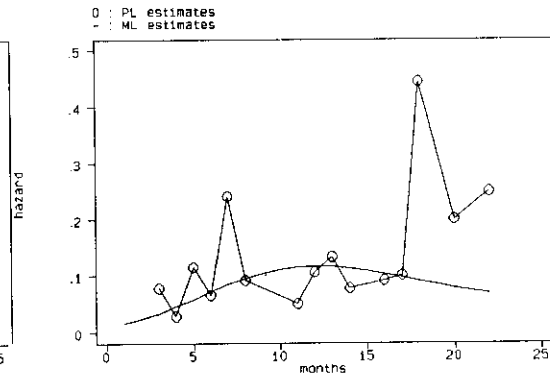


Figure 2d - cubic fit

TABLE 2

Maximum likelihood estimates of a 'simple model' of government duration
 (asymptotic standard errors in parentheses)

	<u>log.</u>	<u>linear</u>	<u>quadr.</u>	<u>cubic</u>
	(1)	(2)	(3)	(4)
Intercept	-9.15 (1.55)	-6.47 (0.35)	-6.88 (0.64)	-7.76 (1.38)
ln Tenure	0.59 (0.27)			
Tenure		0.17 (0.08)	0.46 (0.37)	0.15 (0.14)
Tenure ²			-0.35 (0.50)	-0.32 (0.43)
Tenure ³				0.19 (0.39)
Log Likelihood	-233.36	-235.69	-234.84	-232.98
Likelihood Ratio Statistics vs. (4)		5.42	3.72	

in tenure instead, either do not improve upon the fit offered by the previous specifications while requiring the estimation of additional parameters, or provide a rather poor fit (Figures 2c and 2d and Table 2, Columns (3) and (4)). We therefore abandon such specifications. The first empirical result is, therefore, that the longer an Italian cabinet endures as a government, the higher the probability it falls from power in the next (small) interval of time. Another result is that a logarithmic specification in tenure dominates a linear one. The general specification presented in [1] (when we set $J=1$ and λ_1 is a free parameter to be estimated) contains in fact both the linear and the logarithmic specifications as special cases -- when $\lambda_1=1$ and $\lambda_1=0$ respectively. Hence, the choice between these alternative specifications can be made within the framework of classical statistical inference³⁸. In particular, estimating the unrestricted model yields a point estimate of λ_1 equal to 0.24 (with an asymptotic standard error of 0.28), and an asymptotic likelihood ratio test rejects the null hypothesis that $\lambda_1=1$, and does not reject the hypothesis that $\lambda_1=0$. This suggests the logarithmic specification as an admissible transformation while rejecting the linear one³⁹.

The next step in the model building process consists in the extension of the logarithmic specification in tenure we just discussed to a quasi-conventional 'political' model. At this stage we do not allow economic variables to enter the model, and simply want to compare its explanatory power with respect to the previous studies on cabinet duration. All the political variables presented in Section 5 are introduced into the analysis.

contained in Appendix 2.

³⁸ See, for example, Heckman and Polachek (1974) for an application to the earnings-schooling relationship.

³⁹ The choice of the logarithmic over the linear specification can also be justified by the fact that, the number of parameters being the same, the value of the maximized log-likelihood function is higher using the former specification [Akaike information criterion].

The results are shown in Table 3. The special concern about testing for the presence of lagged duration dependence justifies the specification of three separate models. Column (1) reports estimates of the full political model. In Column (2) only the three variables designed to capture lagged duration dependence are entered. In the model specification of Column (3) then, such variables are eliminated. Looking first at the results contained in Column (1), we see that all the estimated coefficients are of the expected sign. Another interesting result (that emerges also from Column (2)) is that we do not find any evidence of lagged duration dependence of any particular form. Moreover, a Likelihood Ratio test rejects the general specification of Column (1) in favor of the one of Column (3). On the basis of these empirical findings we therefore drop the three variables related to different forms of lagged duration dependence from our analysis. Looking then at the results contained in Column (3), we see that the coefficients associated with crisis duration, cabinet potential duration, early election dummy and government majority status are all significant at conventional levels. Only the effective number of parties in the political system fails to reveal significant influence in explaining the durability of Italian cabinets. The third result of our empirical analysis is, therefore, that the longer the crisis preceding a cabinet's formation and the shorter the time horizon to the expiration of the interelection period, the higher the survival probability of a cabinet. Moreover, majority cabinets (as opposed to minority ones) and cabinets in legislatures emanating from scheduled elections (as opposed to early elections) have a higher probability of staying in power.

Table 4 shows the results of adding to the political model outlined in Column (3) of Table 3 a set of economic covariates. Note however, that, although significant in the previous specifications, we suppress from the model of Table 4 the early election dummy variable. The simultaneous presence of inflation rate and early election dummy in the specification of our model induces numerical problems and our interest in the effect of the

TABLE 3

Maximum likelihood estimates of a 'political model' of government duration
(asymptotic standard errors in parentheses)

	(1)	(2)	(3)
Intercept	-17.22 (4.21)	-9.49 (1.86)	-15.39 (3.37)
ln Tenure	1.47 (0.46)	0.62 (0.30)	1.27 (0.42)
Time-to-exhaustion	1.33 (0.69)		1.15 (0.51)
Early election dummy	1.52 (0.59)		1.29 (0.56)
Crisis duration	-0.28 (0.09)		-0.25 (0.09)
Effective number of parties	0.69 (0.80)		0.60 (0.63)
Government majority status	-1.16 (0.54)		-0.98 (0.44)
Lagged cabinet duration	0.15 (0.19)	0.24 (0.82)	
Lagged coalition duration	-0.51 (1.89)	0.11 (0.15)	
Lagged prime minister experience	-0.17 (0.57)	-0.34 (0.31)	
Log Likelihood	-223.46	-232.35	-224.80
Likelihood Ratio Statistics vs. (1)		17.62	2.52

TABLE 4

Maximum likelihood estimates of an 'extended model' of government duration
(asymptotic standard errors in parentheses)

	(1)	(2)	(3)
Intercept	-18.60 (4.62)	-21.83 (5.62)	-21.64 (5.81)
ln Tenure	1.43 (0.43)	1.72 (0.53)	1.70 (0.54)
Time-to-exhaustion	1.29 (0.49)	1.58 (0.54)	1.59 (0.57)
Crisis duration	-0.17 (0.08)	-0.28 (0.10)	-0.25 (0.11)
Effective number of parties	1.05 (0.93)	1.27 (0.97)	1.21 (1.08)
Government majority status	-0.83 (0.46)	-0.69 (0.50)	-0.64 (0.51)
Current inflation rate	0.70 (0.33)		
Current hours of strike	0.08 (0.08)		
Average inflation rate		1.36 (0.45)	
Average hours of strike		0.20 (0.09)	
Distributed lags of inflation rate			
- ≤ 2 months			0.92 (0.61)
- > 2 months			0.38 (0.70)
Distributed lags of hours of strike			
- ≤ 2 months			0.05 (0.09)
- > 2 months			0.17 (0.13)
Log Likelihood	-224.02	-219.39	-217.82

former variable on the risk of cabinet collapse motivates our choice⁴⁰. A set of results which refer to three different specifications of the model are presented. Column (1) reports estimates of the model in which contemporaneous economic variables are entered. Columns (2) and (3) contain estimates of our model when we consider more articulated dynamics of the impact of economic variables on the downfall probability of a government. If we first look at the results of Column (1), we see how the introduction of the contemporaneous inflation rate and number of hours of strike among the covariates generates contrasting results. While the coefficient associated with the inflation rate is significant at conventional levels, the number of hours of strike has instead a negligible impact (although of the right sign) on the probability of collapse of an incumbent government⁴¹. It seems reasonable, however, that as well as the effectiveness of a policy, the responsiveness of a government to a given outcome might depend on how long that particular government stays in power and lagged realizations of economic variables might play a role. Such considerations justify the specifications adopted in Columns (2) and (3). In Column (2) we simply replace the contemporaneous economic variables in the model of Column (1) with 'recursive averages' of such variables over individual government spells; i.e., if we let $z(t+\tau)$ denote the rate of inflation (number of hours of strike) at time $t+\tau$, we then define its recursive average at time $t+\tau$ as

$$\tilde{z}(t+\tau) = (t+1)^{-1} \sum_{i=0}^{\tau} z(t+\tau-i) \quad t = 1, \dots, T$$

⁴⁰ A possible explanation is as follows. What the early election dummy variable tells us is that there is a structural break in 1972 in the Italian elections pattern, in that since May 1972 all the legislatures have been emanating from an early election. In the mean time however, 1972 also represents a break point in the inflation rate time series, for after the first oil price shock the average inflation rate has significantly been higher.

⁴¹ As a partial test of the theory advanced by Ito (1990), for whom early elections might be called to capitalize on good economic conditions, we also estimated a competing risks model in which we treated an early election as a separate "cause of death" of a government. The results however, stay qualitatively the same and, in particular, the economic variables still enter the hazard function with positive sign.

where $T+\tau$ is the ending time of the government spell beginning at calendar time τ . Such a specification seems to offer a more sensible representation of the process under study than the one of Column (1)⁴². Both the economic variables enter now the model in the form of recursive averages over government spells, emphasizing two ideas: First, that their impact on a government's probability of collapse can not be exclusively contemporaneous; Second, that the relative performance of a government depends on how long that particular government endures in power. To explore these ideas further, we also present the specification of Column (3) which is intermediate between those (extreme) of Columns (1) and (2). If we define a general distributed lag structure of the economic variables over individual government spells as

$$z^d(t+\tau) = \sum_{i=0}^t \alpha_i z(t+\tau-i) \quad t = 1, \dots, T$$

the specification of Column (1) is obtained by putting all the weight on the contemporaneous observations and no weight on lagged realizations (i.e., $\alpha_0=1$, $\alpha_j=0$ $j=2, \dots, t$), whereas the specification presented in Column (2) corresponds to the case in which we assign equal weights to all the current and past observations (i.e., $\alpha_i=(t+1)^{-1}$ for all i). The model of Column (3) contains a two-parameter distributed lag structure for each of the economic variables considered, which is similar to the specification adopted by Tuma, Hannan and Groenevel (1979) to introduce time-dependence into their model. The specification adopted here consists in partitioning the sample period into two subperiods (after having identified an arbitrary fixed break point k time units away from the end of the sample period), and taking recursive averages (as defined above) of the inflation rate and number of hours of strike over these predetermined time intervals (within spells) each

⁴² Note that the specification of Column (2), using the Akaike information criterion, also dominates that of Column (1). According to the same criterion it also dominates the specification of Column (3) of Table (3).

with a different (free) coefficient associated with it⁴³. The idea behind this specification is that of separately assessing the impact of current (and more recent) and past (or less recent) values of economic covariates on the survival probability of a government, while keeping the model parsimonious (in terms of the number of free parameters to be estimated) and imposing a not too rigid structure on the lag distribution⁴⁴. We set k to be equal to 2 months. Two major conclusions can be drawn from the analysis of the estimates reported in Columns (2) and (3). On the one hand, the political variables that appear to be robustly significant -- i.e., with respect to different model specifications⁴⁵ -- in explaining the durability of the Italian government are the length of the crisis preceding a cabinet's formation and the time horizon faced by a government, which is determined by the time to the expiration of the parliamentary term. The estimated coefficient of the former variable is negative denoting that the longer a crisis the lower the probability of

⁴³ Note that this specification reduces to the one of Column (2) if, for each variable, we restrict the two coefficients to be the same.

⁴⁴ Another alternative is to consider normalized geometric distributed lag structures [Dhrymes (1981)] of the inflation rate and number of hours of strike over individual government spells; i.e., if we let $z(t+\tau)$ denote the rate of inflation (number of hours of strike) at time $t+\tau$, we then define its normalized geometric distributed lag structure at time $t+\tau$ as

$$\tilde{z}(t+\tau) = \xi \sum_{i=0}^t \alpha^i z(t+\tau-i) \quad t = 1, \dots, T$$

where

$$\xi = \left(\sum_{i=0}^t \alpha^i \right)^{-1}$$

and $T+\tau$ is the ending time of the government spell beginning at calendar time τ . Note that when $\alpha=1$ $\tilde{z}(t+\tau)$ reduces to $z(t+\tau)$. We estimated this alternative specification using a grid search method for α (numerical problems prevented us from using other optimization techniques) and found that the likelihood function attains its maximum when $\alpha=1$ (both for the inflation rate and for the number of hours of strike). This result can be explained by the fact that a geometric structure does not seem to be 'natural' for the problem we are considering while it imposes a lot of structure on it.

⁴⁵ Note, however, that the results obtained using different model specifications are not directly comparable, for these specifications are not nested.

collapse of the government originating from it. The estimated coefficient of the latter variable is, instead, positive suggesting that the closer the end of the interelection period the longer the expected duration of a government. On the other hand, both the economic variables selected in our analysis -- namely, the inflation rate and the number of hours of strike -- are seen to have a positive impact on the downfall probability of the Italian government, thus suggesting that the worse the state of the economy the more instable the government. This result justifies the concern expressed in the paper. The way in which such economic variables affect the risk of a cabinet's collapse is, however, different as far as its dynamics is concerned. If overall recursive averages of such variables over government spells have in fact both a (positive) significant effect on the survival probability of a government (Column (2)), the inflation rate appears to have a more immediate effect than the number of hours of strike. Looking at Column (3) we see in fact that the coefficient associated with relatively more recent realizations of the process generating the inflation rate is bigger (and significantly different) than the one capturing the effect of past realizations. Such a relationship is reversed for the number of hours of strike, indicating that the impact of tensions on the labor market needs more time to manifest its maximum strength. Inflation and tensions on the labor market are therefore crucial issues for the survival of a government day by day. The importance of this result for the recent rational-PBC theories [Alesina (1987) and Cukierman and Meltzer (1986)] is that the nature of the game being played among policymakers and voters is enriched by this further element. Firstly, if the state of the economy can topple a government in the middle of its tenure and agents are rational, they have to consider this possibility when formulating their strategies, and the issue of time inconsistency of macroeconomic policy⁴⁶ seems to be widened by this new source of uncertainty. Secondly, in a multiparty political regime characterized by a high cabinet turnover rate, we not only have to focus on the repeated

⁴⁶ For which see, for example, Alesina and Tabellini (1988).

election game between politicians and voters, but it also seems to be relevant to concentrate on the repeated bargaining game over government allocations which takes place among political parties within legislatures⁴⁷. Our empirical findings however, together with the results suggested by PBC theories, invite us also to conceive the interaction of economic and political fluctuations as (at least) a two-sided process⁴⁸.

7. Conclusions

The model we propose for the analysis of government tenure histories seems to possess some desirable features for such an investigation and perform relatively well when applied to our case study. The model estimated here generalizes previous work on the same subject in four important respects. First, the flexible functional form we propose and estimate for the cabinet duration process allows us to test for the presence of different types of duration and time dependence. Second, our model offers a more satisfactory way of handling right-censored government spells because of scheduled elections and dealing with the presence of a maximum constitutional interelection period. Third, in addition to some of the variables already identified as important in explaining cabinet duration by earlier theorists, we propose new variables some of which are aimed to capture the peculiarities of the political system under study. Fourth, we incorporate in our analysis time-varying economic variables, for we believe that economic issues are among the most crucial challenges governments face day by day. The major conclusions we draw from our empirical investigation can be summarized as follows. First, we find strong evidence for the presence of positive duration dependence, which rules out the hypothesis of exponentiality of the distribution of government durations assumed by the proponents of the events

⁴⁷ See Merlo (1991).

⁴⁸ Note in fact that if indeed politics causes economic fluctuations (as suggested by PBC theories), then the model we have estimated here is 'misspecified'.

approach. Second, evidence from the calibration of a fully political model shows that all the political explanatory variables selected have the expected effect on the hazard function with respect to the direction of the effect, and four of them -- namely, the duration of the crisis preceding a cabinet's formation, the time horizon which separates a government from the next scheduled election, the majority status of a government and a dummy variable accounting for early elections -- are seen to be significant at conventional levels. Third, in an extended political-economic model the estimated coefficients associated with recursive averages over government spells of selected economic variables -- namely, the inflation rate and number of hours of strike -- are also significant at conventional levels. A feedback from the state of the economy to government duration affects the validity of PBC theories for multiparty parliamentary systems where government turnover within legislatures is possible. The empirical evidence in favor of such an effect we find for Italy is, however, derived conditioning political fluctuations on the business cycle. These final remarks should definitely bring our attention toward the task of devising a general model of the interaction between economic and political factors.

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Appendix 1

A brief description of the Italian political system

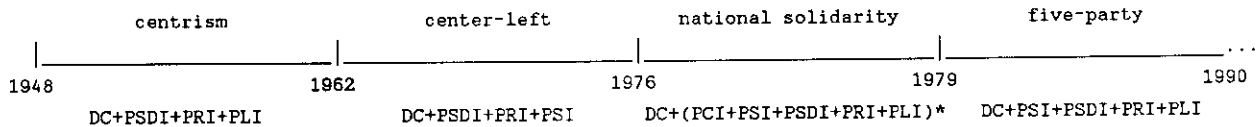
After a national referendum on June 2, 1946 which abolished the monarchy, Italy adopted a republican parliamentary form of constitution that went into effect on January 1, 1948, following a period of provisional government. The Italian political regime is a parliamentary system with a President, a bicameral legislature and a cabinet executive headed by a Prime Minister. The President of the Republic, selected for a seven-year term by an electoral college consisting of both houses of Parliament -- Senate and Chamber of Deputies -- plus delegates named by the Regional Assemblies, is responsible for nominating the Prime Minister and may dissolve the Parliament -- and call new elections -- at any time prior to the last six months of a full parliamentary term, whose constitutional duration is five years. Both houses of Parliament, which have equal legislative power, are chosen by direct universal suffrage under proportional representation (partial for the Senate) and both are subject to dissolution at the holding of new elections. The Prime Minister forms the cabinet. Each cabinet must be separately approved by both Senate and Chamber within ten days of its inauguration, which coincides with the formal act of swearing loyalty to the Republic before the President. If a cabinet fails on either vote it must resign. A cabinet must also resign at any time if the Parliament withdraws its support to the government. When a Prime Minister resigns, the President can ask him to make a new attempt to form a cabinet, designate a new Prime Minister or dissolve Parliament and call an early election.

The first legislature originated from the general election held on April 18-19, 1948. Since then, nine other general elections were held. The last five of them -- starting with the one held on May 7-8, 1972 -- were early elections.

Italy's three major parties are the Christian Democratic Party (DC), the Italian Communist Party (PCI) and the Italian Socialist Party (PSI). The Christian Democratic

Party constitutes the core of virtually all postwar Italian governments¹. Although the Italian Communist Party is the largest communist party in Western Europe and has always been widely supported by the electorate, it is unrepresented in the government since 1947. The Italian Socialist Party is the emerging political force of the '80 and has been part of various government coalition formulas since the mid '60. Three smaller moderate parties that have participated in many postwar government coalitions are the Italian Social Democratic Party (PSDI), the Italian Republican Party (PRI) and the Italian Liberal Party (PLI). A minority party which is worth mentioning is the Italian Social Movement (MSI).

Four government coalition formulas characterize Italian governing alliances after 1948. They succeeded each other in the order indicated in the following diagram:



* external support

¹ Note that only four cabinets were headed by a non-Christian-Democrat and no government coalition was ever formed without the Christian Democratic Party in it.

Appendix 2

A non-parametric analysis of government duration data

A well-known non-parametric instrument for the analysis of duration data is the product-limit (PL) or Kaplan-Meier estimator of the empirical distribution function [Kaplan and Meier (1958)]. Such an estimator -- which has been shown to be strongly consistent and equivalent to a maximum likelihood estimator [Johansen (1978)] -- is obtained by calculating the hazard at each time t at which any non-zero number of failures is observed. Hence, the distribution obtained is a discrete one. In the present application data on durations of Italian governments are transformed from days into months, rounded off to the nearest figure and ordered in ascending order. To define the PL estimator let $R(t)$ denote the set of governments 'at risk' at time t -- which is the set of governments still in power just prior to time t -- let n_t be the cardinality of this set -- i.e., the number of elements in it -- and let d_t be the number of governments that fall from power at time t -- not including those which are censored by time t . Then the PL estimator of the hazard rate at time t is

$$\hat{h}_t = d_t/n_t$$

and consequently, the PL estimator of the survival function at time t is

$$\hat{S}_t = \prod_{i=1}^t (1-\hat{h}_i)$$

and the PL estimator of the integrated hazard at time t is

$$\hat{H}_t = \sum_{i=1}^t \hat{h}_i$$

A plot of the estimated PL hazards (not including the longest government in the sample) is shown in Figure 3. As we can see there is a noticeable increasing trend in the hazard plot that would suggest the presence of positive duration dependence. The presence

Figure 3 - HAZARD PLOT

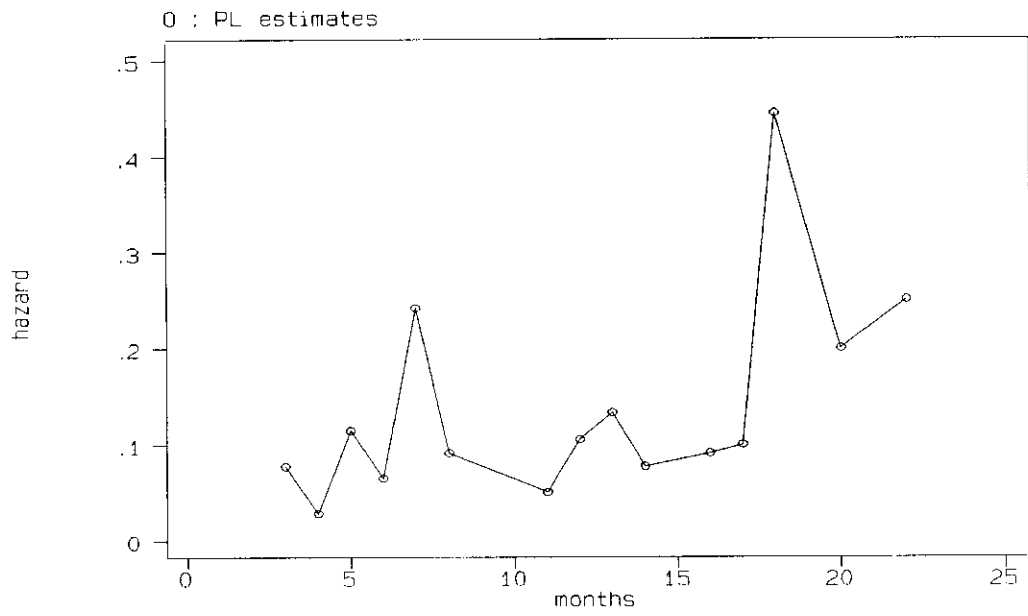
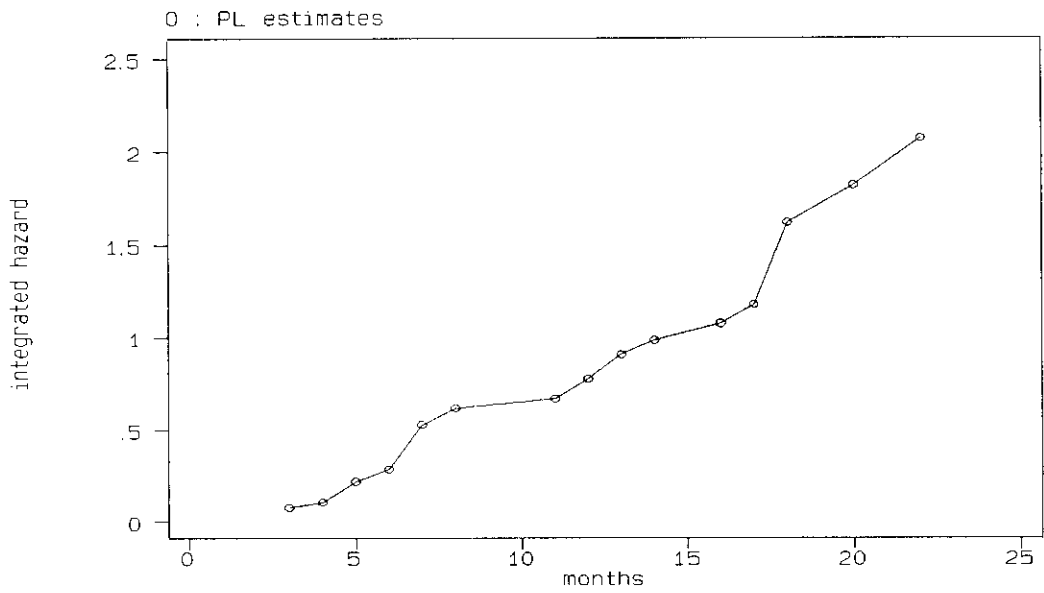


Figure 4 - INTEGRATED HAZARD PLOT



of two remarkable spikes respectively at 7 and 18 months however, makes the empirical distribution function non-standard. The same conclusions can be drawn by looking at the plot of the estimated PL integrated hazards shown in Figure 4. As we can see the overall convex shape of the integrated hazard that indicates the presence of positive duration dependence is bothered by two mass points at 7 and 18 months. These mass points however, seem to be generated more by a pervert mechanism of coincidences related to the specific sample we are working with than by explainable regularities in the government turnover process.

Some slightly more formal evidence is provided in Table 5, which presents the results of some least-squares regressions on the estimated PL survival function. Given that the survival function for an exponential distribution with hazard

$$h(t) = \alpha$$

is

$$S(t) = \exp\{-\alpha t\}$$

the regression

$$\ln(S_t) = \beta t + u$$

yields a coefficient $\hat{\beta}$ whose absolute value is equal to the average hazard (and if the distribution is exactly exponential then the R^2 is equal to one). Moreover, given that the survival function for a Weibull distribution with hazard

$$h(t) = \gamma \alpha t^{\alpha-1}$$

is

$$S(t) = \exp\{-\gamma t^\alpha\}$$

TABLE 5**Summary regressions on PL estimates**
(standard errors in parentheses)

	<u>$\ln(S_t)$</u>	<u>$\ln(-\ln(S_t))$</u>
Intercept	-	-4.146 (0.210)
t	-0.087 (0.005)	-
$\ln(t)$	-	1.615 (0.090)
R ²	0.880	0.960
Observations	15	15

the regression

$$\ln(-\ln(S_t)) = \beta_0 + \beta_1 \ln(t) + u$$

yields a coefficient $\hat{\beta}_1$ which represents the duration dependence parameter of a Weibull distribution (and if $\hat{\beta}_1 > 1$ then there is positive duration dependence). The first column of Table 5 indicates that the average hazard in the sample is about 0.09; the relatively low R^2 indicates that the distribution should not be mistaken for an exponential. The second column indicates a better fit for the Weibull specification and evidence for the presence in the data of positive duration dependence.