MEASURES OF POLITICAL INSTABILITY IN MULTIPARTY GOVERNMENTS: A NEW DATA SET WITH ECONOMETRIC APPLICATIONS

Fabrizio Carmignani[1]

Glasgow University

Abstract

The multidimensional nature of political instability requires several political indicators and measures to be collected and used in the econometric analysis of the interactions between instability and economic performance. The data set presented in this paper contains time-series for 30 political measures, covering the whole post-war era in 14 countries with significant experiences of coalition governments.
Two econometric applications that make use of the indicators contained in the data set are presented. The first one is a statistical analysis of the determinants of cabinet duration. The second one is an investigation of potential political determinants of government consumption expenditure. It appears that the economic cycle significantly affects the probability of government collapse and that the ideological orientation of the cabinet does influence the level of public expenditure.

Fabrizio Carmignani,
Department of Economics,
Adam Smith Building,
University of Glasgow,
Glasgow G12 8RT,
UK
Email: 9322561c@student.gla.ac.uk

[1] I would like to thank Julia Darby, Anton Muscatelli and Ulrich Woitek for helpful discussion. I also received valuable comments from Nick Braun, Patrizio Tirelli, Carmine Trecroci and participants at workshops at Glasgow University.

Introduction.

Coalition governments and coalition politics are of specific interest to scholars investigating the interaction between politics and economic performance for (at least) two reasons. First of all, they tend to be a rather regular phenomenon in most of the countries that have experienced an uninterrupted post-war history of democratic governments. They are actually the norm in Italy, Finland, France, the Netherlands, Luxembourg, Belgium, Austria, Australia, Israel, Germany, Iceland and Switzerland. In Ireland, Sweden, Denmark and Norway coalitions alternate with single-party governments. Spain, Greece and Portugal have not been democratic throughout the post-war era, but since the establishment of fully democratic regimes, coalitions have occurred regularly.[2] Second, because of their very nature, coalition governments are likely to add several new dimensions to the standard notion of political instability. Therefore research in this area seems to be particularly intriguing.

In the economic literature the interest in the relationship between political instability and economic performance is well established.[3] In those models political instability is usually intended as being generated by electoral uncertainty and it affects economic performance via a *myopia* channel: when facing uncertain prospects of re-election, politicians have an incentive to engage in short sighted economic policies. This leads to inefficient paths of public expenditure, deficit and debt accumulation, distorted investment decisions and ultimately low economic growth. However, the large amount of contributions produced in the political science literature on coalition politics suggest that a few other mechanisms could be at work and that the definition of political instability should also account for the interaction between the executive and the legislature, the ideological

[2]Similar experiences also seem to be shared by the new democracies in East Europe.
[3]Calvo and Drazen (1997), Deveraux and Wen (1996), Persson and Tabellini (1998) and Darby, Li and Muscatelli (1998) are some examples of this strand of the literature.

heterogeneity of partners and the outcome of bargaining over portfolios allocation.[4]

On the theoretical side, the focus on coalitions requires game theoretic models of bargaining and coalition formation (and disruption) to be adapted to a more general economic set up.[5] On the empirical side, a broad set of political and institutional data must be collected and used to construct valuable proxies for coalition instability.

This paper focuses on the empirical side. A new political data set covering the whole post-war period for 14 countries is presented. Section 1 contains a full description of the measures and indicators included in the data set. Section 2 and Section 3 present two econometric applications in which the data are used to shed some additional light on the interaction between politics and economics in countries with coalition governments. Although the main purpose is to demonstrate the usefulness of the data set, some interesting results arise, which also give indications for further theoretical developments. Results are compared (where possible) with those achieved by other authors in this field. Finally the discussion of a specific issue related to the construction of the data set (the definition of parties ideological location) is contained in Appendix 1. The tables with the results of the two econometric applications are given in Appendix 2.

Section 1: Political Data Set on Coalition Governments and Parliaments, 1945-1998.

General remarks

Following Woldendorp et al. (1993), countries with an uninterrupted post-war history of democratic-party governments are: Australia, Austria, Belgium, Canada,

[4] For an overview of work on coalition politics, see, *inter alia*, Laver and Shepsle (1996a,b)

[5] A seminal contribution in this sense is given by Alesina and Drazen (1991). Recent advancements are proposed by Dalle Nogare (1997) and Bellettini (1998).

Denmark, Finland, France, Germany, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Sweden, Switzerland and the United Kingdom. USA are not included in the list since they represent a clear-cut case of separation of powers between the Head of the State, the Legislature and the Judiciary: the Administration is accountable to the President and only indirectly dependent on the Parliament. Thus in this respect USA are a truly presidential democracy, whilst the European presidential democracies (such as France and Finland) can be regarded as "semi-presidential" and hence they are included in the list.

The focus on coalitions implies that of the 20 countries just mentioned, three have to be dropped (Canada, United Kingdom and New Zealand) because of the lack of significant experiences of coalition cabinets.[6] Moreover, it was not possible to find reliable information on the ideological location of parties in Japan, Israel and Switzerland covering a sufficiently long length of time. Since information on ideological location is central for the computation of some of the measures included in the data set, those three countries are excluded from the data base.

All in all, 14 countries are left: the group of western European countries plus the Scandinavian countries and Australia. Each country is observed throughout the

[6] A coalition cabinet is defined as a cabinet supported by an aggregation of two or more "distinct" parties, each of which occupies at least one cabinet post. Therefore parties giving only "external support" are not considered as members of the coalition. For example Cabinet 18 (Jorgenson I) in Denmark was supported by Social Democrats (SD), Radical Liberals (RV), Socialist People's Party (SPP) and Communists (DKP) but only SD occupied cabinet posts. Therefore that specific cabinet is considered, for the purposes of the construction of the data set as single-party (minority) government.

Parties must be "distinct" in the sense that they can be regarded as autonomous political identities, with independent decision bodies and hierarchies, specific names and symbols. Eventually, two parties might be "distinct" one from the other even if they share the same ideological location in the policy space. For example, Christian Democratic Union (CDU) and Christian Social Union (CSU) in Germany are often regarded as a unique party on the grounds that their elected representatives form a unique group in the *Bundestag* and that they have always been sharing office together. In fact, the ideological location of the two parties does not always coincide (with the CSU more shifted towards the right , according to experts' judgements produced over the '80s and the '90s) and the two parties have kept throughout the post-war era separated identities. For this reason in the computation of the measures included in the data set CDU and CSU are treated as two different parties. When a cabinet is supported by CDU and CSU only (Adenauer VI and VIII and Erhard III), then the cabinet is considered as supported by a coalition of two parties rather than a single party government.

post-war era, data are updated until the last possible available year (usually 1998). Overall, measures regarding the characteristics of more than 400 cabinets are included in the data set. In addition to those, the data set includes measures on the characteristics of the legislatures in each country (such measures will be equal across cabinets in office under the same legislature) and a set of dummy variables to account for country-specific institutional arrangements. Finally, the three classifications proposed in Woldendorp et al. (1993) are also reported for each cabinet.

The basic reference for raw data on coalitions composition and portfolios allocation is Woldendorp et al. (1993 and 1995), updated using several issues of the *European Journal of Political Research.* The basic reference for raw data on electoral results is Mackie and Rose (1991 and 1997). *Political Parties of the World* (Keesing's Archive Publication, 1985) and *Party Organisations* (Katz and Mair, 1990) have been used to double check information on parties' identity and ideological orientation.[7] Specific sources for the technical definitions of non-original measures are also acknowledged below. In some cases, these technical definitions have been modified in order to better fit with the need of reflecting political instability.

Description of the indicators and measures in the data set

The general procedure for the computation of each measure is described below. Where the general procedure appears to be quite complex, examples drawn from real world situations are given. First, cabinet-specific measures are presented, then the group of measures related to characteristics of the legislature, then the

[7] Some other sources have been used for additional information concerning specific indicators or countries and these will be explicitly acknowledged below. Basic sources for the determination of ideological left-right scales will be discussed in Appendix 1.

institutional dummy variables. The three Woldendorp's classifications reported in the data set are *reason for termination* (*RfT*), *types of government* (*ToG*) and *complexion of parliament and government* (*CPG*).[8]

CABINET-SPECIFIC MEASURES

Share of seats held by the coalitions

A pretty standard way to proxy the stability of coalitions is to look at the share of seats they control as a proportion of total seats. This information is provided in the data set together with a dummy variable for majority status (i.e. the dummy is equal to 1 if the cabinet is supported by a coalition holding 50% + 1 of seats).

Effective number of parties in the coalition and fragmentation of the coalition.

Assume that the share of seats held by party *i* as a proportion of the total number of seats held by the coalition is equal to p_i and that the total number of coalition partners is *n*. Then, following Laasko and Taagepera (1979), the effective number of parties is determined by:

$$(1) \quad ENP = \frac{1}{\sum_{i=1}^{N} p_i^2}$$

The measure of fragmentation of the coalition follows immediately from ENP:

(2) FRA = 1-1/ENP

[8] For a full description of these variables the reader is invited to refer to the original paper by Woldendorp et al. (1993).

In fragmented coalitions it is in general more difficult to achieve agreement over the policy to be carried out and/or, once an agreement has been reached, it can be more easily broken by one of the partners. In order to keep a fragmented coalition together, the process of policy formation might be distorted in the sense of generating as an outcome a policy able to satisfy competing claims of different partners, but unable to improve on the economic performance of the country.

Alternation

Strom (1984) defines alternation as the share of seats held by parties leaving the government plus the share of seats held by parties entering the government. Where general elections intervene between two successive governments, calculations are based on the composition of the legislature after elections. Alternation is therefore an index of returnability: it gives information on the likelihood of a partner to be included in the next coalition if the incumbent government terminates. It therefore affects the incentive of partners (especially small partners) to break down the *status-quo* agreement and it can also be interpreted as an indicator of the credibility of threats to withdraw support (which are often used by partners in the coalition to obtain policies closer to their most preferred-one).

Concentration of the opposition

It is given by the number of seats held by parties on the numerically largest side of the opposition as a proportion of the total number of opposition seats (Strom, 1984). An example can help to clarify the procedure to compute this measure. Cabinet 20 in Austria (Vranitzky IV[9]) was formed after the 1994 elections. As a

[9] Throughout the paper the convention of using roman number to identify the sequence of cabinets chaired by the same prime minister is followed.

result of those elections five parties obtained parliamentary representation (number of seats held and abbreviations are in brackets): Austrian People's Party(ÖVP, 52), Socialist Party (SPÖ, 65), Freedom Party (FPÖ, 42), Liberal Forum (LF, 11), Greens (13). The cabinet was a SPÖ/ÖVP coalition. A unidimensional left-right political scale can be found in Figure 1:[10]

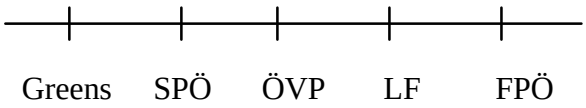

Figure 1

The coalition held 117 seats, the opposition as a whole 66. However, as it can be seen from the above diagram, the opposition was ideologically fragmented: on the left of the coalition were the Greens, on the right were the LF and the FPÖ. The Greens held 13 seats whilst the LF and FPÖ held 53 seats. Thus, LF and FPÖ represented the numerically largest side of the opposition, holding a proportion of 80.3% of the total opposition seats. Therefore 0.803 is the measure of concentration of opposition imputed to Cabinet 20.

How concentration of opposition might affect economic performance is *a-priori* rather ambiguous. On the one hand, one can believe that with a less concentrated opposition, the cabinet can complete the process of policy formation more quickly and without the need to pursue compromise solutions. But, on the other hand, the opposition can have an important constructive role by co-operating with the governments on broad-interest issues and/or acting as a discipline device for incumbent coalitions. Of course, for a fragmented opposition the chances to play such a constructive role are smaller.

[10]Details on the construction of such scales are given in the appendix. For this specific case, the relevant reference is Huber and Inglehart (1995).

Ideological diversity of coalition partners.

Coalitions are formed by parties with different ideological orientation. Laver and Shepsle (1996 a,b) have convincingly argued that even office motivated politicians do have an interest in the contents of the policy undertaken by the government and they try to bring it closer to their own most preferred policy. Therefore it is important to look at the degree to which ideologies differ across coalition partners. The larger the ideological gap, the more likely conflicts are to occur and the process of policy formation to be slowed down.

The policy a coalition will undertake is the outcome of a bargaining game among coalition partners and therefore it is often unknown *ex-ante* (i.e. before the negotiations have been completed). Clearly, if the game is played by parties which are ideologically close, little overall uncertainty about the future course of economic policy is generated. But if the game involves parties relatively distant (in ideological terms) one from another, then the range of possible final outcomes of the bargaining process broadens and the overall degree of uncertainty increases. Such uncertainty distorts investment decisions and resource allocation.

A first measure of ideological diversity has been suggested by Taylor and Laver (1973). They collect information from several specialist studies and determine an ideological ordering (from left to right) of parties, similar to the one depicted in Figure 1. Then, for each coalition they count "spaces" and "holes" separating partners. The sum of this spaces and holes is the suggested indicator of ideological diversity. To illustrate this idea, consider again the 20th Austrian cabinet (Vranitzky IV). Between ÖVP and SPÖ there is one space and no holes. Thus the indicator of ideological diversity for Vranitzky IV is 1. If instead, the government had been formed by ÖVP and FPÖ there would have been two spaces and one hole (corresponding to LF not included in the coalition) for a total of 3 as a measure of ideological gap.

Conflict of Interest.

A more sophisticated way to account for ideological diversity of coalition partners builds on the work of Axlerod (1970) on the conflict of interest theory. The computation of measures of conflict of interest requires a cardinal left-right ideological scale to be developed. More information is needed compared to the computation of the previously described measure of ideological diversity. For the latter a simple ordering of parties was enough, for computation of conflict of interest indicators cardinal locations must be defined. On cardinal scales, parties are located on a [1,10] interval, with 1 representing extreme left and 10 extreme right. As an example, the cardinal locations for the five parties which obtained seats in 1994 Austrian elections were: Greens 2.86, SPÖ 4.75, ÖVP 6.23, LF 6.23 and FPÖ 8.63. Notice that, obviously, the ordering of parties from left to right corresponds to the one given in Figure 1.[11]

Four measures of conflict of interest are actually computed in the data set. The first one is defined as the variance of the unweighted locations of coalition partners. Let L_A be the location of coalition partner A, L_B the location of coalition partner B and L_C the location of partner C, then CI1 is equal to *Variance* (L_A, L_B, L_C).

The second measure (CI2) is given by the sum of the squared deviations of each party location from the "weighted average location". By "weighted average location" it is meant the location of the coalition as a whole. This is computed as:

$$(3) \quad W = \sum_{i=1}^{n} (p_i L_i)$$

[11] Further details on the construction of political scales with cardinal locations are given in the Appendix

where p_i is the share of seats held by a generic coalition partner *i* as proportion of the total number of seats held by the coalition, L_i is party *i*'s location and *n* is the number of parties in the coalition. Given (3), CI2 is equal to:

$$(4) \quad CI2 = \frac{\sum_{i=1}^{n} (L_i - W)^2}{n}$$

The third measure of conflict of interest is the weighted sum of the squared deviations from the weighted mean defined in (3):

$$(5) \quad CI3 = \sum_{i=1}^{n} p_i (L_i - W)^2$$

where all the symbols are defined as in (3).

The last definition of conflict of interest is a slight modification of (5). Instead of taking the square of deviations from W, the absolute values of such deviations enter the formula:

$$(6) \quad CI4 = \sum_{i=1}^{n} p_i |L_i - W|$$

Not surprisingly, the four measures of conflict of interest are strongly positively correlated. However, the correlation coefficients are smaller than one, so that probably the four measures are able to capture different aspects of the same phenomenon.

Dummy for ideological location

Computation of the indicators of conflict of interest yields as a by-product a statistical measure of ideological location of the coalition as a whole (W defined in

equation (3)). The measure W is statistical in the sense that it considers only the location of parties and their weight in the coalition, it does not look at the allocation of portfolios amongst partners, which is probably a key factor in determining the effective ideological location of the cabinet. The construction of an additional data set of real ideological locations of cabinets is currently in progress. However, the statistical ideological location is itself of interest and it will play quite a significant role in the two econometric applications proposed in the next sections. The data set contains the measure W for each cabinet. In addition to that, a dummy variable is defined, which takes value 1 for cabinets whose W is to the right of the median location 5.5.

Total portfolio volatility, party portfolio volatility and within party reshuffles.

Huber (1998) argues that portfolios volatility might play a relevant role in shaping the process of policy formation. With high volatility, ministers stay in office for a relatively short time and thus they do not have the time to build up much knowledge and expertise. Senior civil servants, instead, experience a much lower turnover and they are bale to accumulate valuable information they might decide not to share with ministers. Thus high volatility of portfolios is regarded as a potential reason for "bad decisions" to be made.

Total portfolio volatility is therefore computed by comparing the allocation of portfolios between two successive cabinets. Such a comparison can highlight five different situations: (a) a portfolio is assigned to the same minister who was in control of it in the outgoing cabinet, (b) a portfolio is assigned to a new minister who belongs to the same party of the outgoing minister, (c) the new minister is not of the same party as the old minister, (d) a portfolio is eliminated, (e) a new portfolio is added. With the exception of (a), all other events give rise to some form of volatility. However there is a clear difference between (b) and (c).In the first case, it is likely that some kind of information spillover will take place between

the two ministers of the same party (they share the same ideology so they should co-operate [12]). In the second case, especially if the two parties are located far away from each other on the ideological scale, the extent of information spillover will be very limited. According to this argument, two different measures of volatility are computed. Total portfolio volatility is the sum of (i) the number of changes in individuals controlling portfolios (independently from the partisanship of the two ministers), (ii) the number of portfolios eliminated, (iii) the number of portfolios added. In party portfolio volatility the term in (i) is replaced by the number of changes in the party controlling portfolios. The difference between total portfolio volatility and party portfolio volatility is the number of within party reshuffles.

Ideological portfolio volatility

This measure combines the information on ideological location of parties with the information on portfolios volatility. It has been used by Huber (1998) and it is the sum of the Euclidean ideological distances for each portfolio change divided by the total number of portfolios transferred. Consider the following example. Cabinet 17 in Austria (Vranitzky I) was supported by a coalition SPÖ/FPÖ. The following Cabinet 18 (Vranitzky II) was supported by a coalition SPÖ/ÖVP. Since there was a change in the partisan composition of the coalition, it is likely that some portfolios "flew" from FPÖ to ÖVP. Indeed, 2 portfolios (Deputy PM and Defence) shifted from FPÖ to ÖVP. In addition to that, other changes were observed: 4 from SPÖ to ÖVP (Education, Agriculture, Environment, Social Affairs), 1 from FPÖ to SPÖ (Industry and Trade), 1 from FPÖ to a non-aligned minister (Defence), 3 new cabinets were created and 2 eliminated. The ideological scale for those years (1986-1987) was: SPÖ 3.7, ÖVP 6.27, FPÖ 7.12 (the fact

[12]This argument is particularly true if the party can be viewed as a unitary actor. If instead parties are characterised by significant internal divisions, then the transmission of knowledge between two ministers of different wings of the same party can be very difficult.

that these locations are different from those of the previous example should not be surprising since parties tend to move on the left-right scale over time). For the purpose of computing ideological portfolio volatility the shift to the non-aligned minister and the 5 creations/eliminations are not relevant.[13] Thus:

IPV = [1*(7.12-3.7) + 4*(6.27 - 3.7) + 2*(7.12 - 6.27)]/7 = 2.205

Duration, survival rate and time horizon

For each cabinet the duration in days, and the corresponding number of years, are reported. Those data on duration are taken from Woldendorp et al. (1993) and therefore their conventions about the definition of the date of constitution and the date of termination of the cabinet are adopted. In short, the life of a cabinet starts when the formal process of investiture is completed and terminates only when a new cabinet is formed.[14] However, in order to guarantee cross-country comparability, duration data should be expressed as the proportion of days a government lasted in relation to the maximum period between elections allowed by the constitution. This ratio, which is called survival rate, is also included in the data set..

A problem with the survival rate is that it does not account for the fact that the time horizon of a cabinet not formed immediately after an election is often considerably shorter than the maximum period between elections allowed by the constitution. The effective time horizon is taken into considerable account by the government when deciding over economic policies and it is therefore important to provide information on it. The data set does contain this information in the form of

[13]It would be problematic to define the ideological location of a non-aligned minister. For newly created (eliminated) posts the start (arrive) of the ideological journey of the portfolio is missing.

[14] The convention about the date of termination follows from the fact that even after its political death, the outgoing cabinet usually stays in office as a caretaker government (often with powers limited to ordinary administration) until the incoming cabinet is officially invested.

a level variable called time left and a ratio variable called time horizon. Time left is given by the constitutionally established period between two elections minus the time elapsing between the date of last elections and the date of constitution of the government. Time horizon is the ratio between time left and the maximum potential period between two elections.

Coalition experience and prime minister expertise

Going through the process of policy formation in complex political environments requires some expertise. This can be accumulated in two forms. First, it can be accumulated by the coalition as a whole: the longer the time the same coalition has been in power, the more experienced the coalition itself is likely to be. This means that relationships between partners are more likely to occur along well-known lines of behaviour and thus within coalition conflicts should be less frequent. Second, personal expertise accumulated by the prime minister is also likely to matter, given that a process of learning by doing could be at work.

Two measures are computed in the data set. The first one is "Coalition Experience" and it is equal to the cumulative duration of all previous governments controlled by the same coalition. The second measure is "Prime Minister expertise" and it is given by the cumulative duration of all previous governments headed by the same prime minister. The two measures have been introduced by Mauro (1998) following an argument put forward by Strom (1988).

Compatibility index

This is a simple index of compatibility between the share of votes and the share of portfolios received by coalition partners. For each of the *n* partners of a coalition the difference between the share of electoral support and the share of portfolios controlled is computed. Then, the *n* differences for the *n* partners in the coalition

are added up. The index is expressed as a percentage and technically it falls in the range [0 , 1.999]. The value 0 corresponds to the case where all the parties which contested elections are included in the coalition and each party controls a share of portfolios exactly equal to its share of votes. The value 1.999 is the extreme case of a party receiving a very small share of votes (say 0.001%) and controlling all portfolios. In fact, the effective range for the countries in the data set is [0.051 , 0.889] with an average of 0.4704 and a standard deviation of 0.1349.

The policy implemented by a coalition government is the result of bargaining amongst coalition partners over portfolios allocation. Carmignani (1999) discusses some alternative models of bargaining. In spite of the differences in the extensive form of the game and the design of the process, for all these models it seems to be true that the outcome does not necessarily relate to the parliamentary size of the actors involved. This implies that the preferences expressed by voters might well be distorted and the policy outcome be rather different from what would be obtained in an hypothetical direct democracy where citizens choose policies without the intermediation of representatives or political parties. The compatibility index is meant at capturing such a distortion. However, some caveats must be stressed. For example, an electorally small party could be able to hold out for the control of just one, but key portfolio. If this is really the case, then this party would be able to influence the policy of the coalition to a considerable extent, in spite of the fact that its aggregate share of portfolios is small (and hence consistent with the small share of votes received in the elections). Thus, voters' preferences could be frustrated even when the share of portfolios allocated to each partner roughly reflects the share of votes that party received. Moreover, the distribution of voters' preferences on each dimension of the policy space could be only imperfectly approximated by the distribution of votes, so that an allocation of portfolios that somehow reflects the distribution of votes could in fact be an imperfect representation of citizens' preferences on some dimensions.

MEASURES RELATED TO THE LEGISLATURE AS A WHOLE

Effective number of parties and fragmentation of the legislature

These two measures are based on the same equations (1) and (2) previously defined with regard to the coalition. Now, all parties with parliamentary representation are included and not just coalition partners. More fragmented legislature are usually believed to generate more fragmented coalitions. Moreover, a large effective number of parties implies that several different viable coalitions can be formed at any time. The existence of such a large number of alternatives can make the incumbent government more "fragile" in the sense of increasing the likelihood of votes of no-confidence to be cast and/or by making partners' threat to withdraw support and join in another of the several possible coalitions more credible.

Electoral Volatility and Parliamentary Volatility.

Powell (1982) defines volatility of the party support as the sum of the share of votes (electoral volatility) or seats (parliamentary volatility) added or lost by each party in present elections respect to the previous contest, divided by two. Parties which contest only one elections add their entire share of seats or votes. As an example consider the definition of volatility for the third legislature in Sweden (1952). Previous elections had been held in 1948. In both electoral contests only five parties competed and received seats. Electoral results and share of seats are reported in the Table 1 below:

	1948		1952	
	seats (%)	votes (%)	seats (%)	votes(%)
SDA	48.7	46.1	47.8	46
MUP	10	12.3	13.5	14.4
BF/CP	13	12.4	11.3	10.7
VPK	3.5	6.3	2.2	4.3
FP	24.8	22.7	25.2	24.4

TABLE 1. Source, Mackie and Rose (1991).
Parties are as follows: Social Democrat (SDA), Conservative Party (MUP), Centre Party (BF/CP), Left Party (VPK), People's Party (FP).

Parliamentary volatility is then given by:

PV=[(0.461-0.46)+(0.144-0.123)+(0.113-0.107)+(0.043-0.022)+(0.252-0.244)]/2=0.039

Electoral volatility is given by:

EV=[(0.487-0.478)+(0.135-0.10)+(0.13-0.113)+(0.035-0.022)+(0.252-0.248)]/2=0.038

Large electoral volatility (and/or parliamentary volatility), reflecting more volatile preferences of voters, makes the electoral outcome more uncertain. Uncertainty of electoral outcomes is often regarded as the original cause of *myopic* policy choices (Darby, Li, Muscatelli, 1998).

Polarisation

Several theoretical models point out that inefficient policy choices are likely to be made in polarised socio-political system (Powell, 1982, Warwick, 1992 and

Alesina and Drazen, 1991). A quantitative definition of polarisation has been proposed by Powell (1982). This is given by the total share of support expressed by voters for "extremist" parties; that is, for those parties whose ideological orientation is towards a radical change of the existing system. Based on the original definition of extremism as well as on the country-specific list of extremist parties provided by Powell for the '60s and the '70s, an updated list of parties whose share of votes have to be included in the index of polarisation has been compiled. This covers the whole post-war era and makes use of the information incorporated in the new sources available since early '80s. For each country, at the time of each general election, the index of polarisation includes the share of votes received by parties which fall in at least one of the five following categories: (i) parties explicitly labelled as Communists or Neo-Fascists, (ii) parties included in the original list provided by Powell, (iii) parties whose ideological orientation is explicitly independentist (for example, this is the case of the Northern League in Italy in 1992, 1994 and 1996), (iv) parties located to the right of 8.5 or to the left of 2.5 on the ten points ideological scales which are to be discussed in the Appendix, (v) parties whose ideological orientation as stated in *Political Parties of the World* (Keesings Publication, 1986) is unambiguously extremist in the original definition given by Powell.

General Instability and Partisan Cabinet Instability

Probably, the simplest common sense idea of instability is represented by the frequency of observed cabinet terminations. Huber (1998) suggests how to incorporate this simple idea in two quantitative indicators. The indicator of General Instability is given by the annual average number of terminations observed between two elections. The indicator of Partisan Cabinet Instability is equal to the annual average number of changes in the partisan composition of the cabinet. A few technical details in the computation of these two measures are worth stressing.

With regard to the measure of General Instability, it has to be noticed that not all terminations should be taken as a symptom of instability. Woldendorp et al (1993) identify six possible *reasons for termination*: (a) elections, (b) voluntary resignation of the prime minister, (c) resignations of the prime minister due to health reasons, (d) dissension within the cabinet, (e) lack of parliamentary support, (f) intervention by the Head of the State. Obviously, terminations (b), (c), (d) and (f) must be included in the computation of the index. Terminations due to health reasons (c), instead, should not be included because they have nothing to do with the idea of cabinet instability or political instability. More subtle is the inclusion of terminations falling in group (a). On the one hand scheduled mandatory elections constitute a compulsory endpoint in the life of a cabinet. A cabinet could well survive beyond the date of elections, but in parliamentary democracies the incumbent has to resign when a new parliament is formed. Thus, life of cabinets is censored when elections are held. On the other hand, elections are often anticipated (that is, held before the end of the constitutionally established term). Usually anticipated elections are held whenever a government is confronted with either a no-confidence vote or internal dissension and no alternative coalition is viable. Therefore, when caused by anticipated elections, cabinet terminations do seem to represent a form of instability and they should be included in the computation of the index of instability.[15]

The second technical point relates to the computation of the measure of Partisan Cabinet Instability. When general elections intervene between two successive governments, the change in the partisan composition of the coalition is imputed to the new legislature. The rationale behind this choice is that the outgoing cabinet usually stays in office (possibly with only limited powers) until the incoming one is formed. Thus, the formal switch from the old partisan composition to the new one takes place under the new legislature.

[15] Elections are not considered anticipated if they are held within the six months before the constitutionally established term.

Duration and survival rate of the legislature

As for cabinets, duration and survival of the legislature are reported in the data set. Duration is expressed in days and fraction of years, survival is simply the ratio between effective duration and maximum constitutionally established term.

Institutional dummy variables.

To account for cross-country differences in constitutional factors concerning government cycles, three dummy variable are included in the data set. The dummies are based on the discussion proposed by Laver and Schofield (1990, chp. 4). The first dummy (Investiture) takes value one if a formal investiture vote is needed (as in Belgium, Ireland and Italy, for example) and zero otherwise. The second dummy (government power) takes value one if the government can dissolve the legislature (as it is commonly the case with the notable exception of Norway and Finland) and zero otherwise. Finally the third dummy (legislature power) takes value one if the legislature can dissolve itself (as it is the case in Austria) and zero otherwise.

Section 2: Econometric analysis of determinants of cabinet duration.

The first of the two econometric applications proposed as an example of how the political data set of Section 1 can be used is aimed at identifying the determinants of cabinets duration. Short durations (which lead to high government turnover) are often regarded as the key indicators of political instability (see Alesina et al. 1996 *inter alia*). Theoretical arguments suggest that various political, institutional and economic variables are likely to have a significant impact on cabinet survival. A

very good survey of the theoretical as well as empirical results achieved in this field of research can be found in Grofman and Van Roozendaal (1997).

Duration data are peculiar for two reasons. First of all, they can never take negative values. The standard assumption of normality of the data is thus violated. A possibility would be to assume log-normality (Greene, 1993). However, this strategy does not overcome the second, more fundamental, issue: cabinet duration are often in the nature of censored observations. Right-censoring occurs when the cabinet terminates either because mandatory, non-anticipated elections are held or because of resignation of the Prime Minister motivated by health problems. Notice that terminations due to anticipated elections do not give rise to censored observations. In effect, whilst non-anticipated elections represent a constitutionally established deadline, independent from political conditions (i.e. the cabinet might well have survived longer, had these elections not taken place), anticipated elections do reflect a political stalemate involving the executive and the legislature. In other words, anticipated elections are a symptom of political instability and hence the associated cabinet terminations have to be treated as non-censored observations.

Because of these peculiarities, the econometric analysis of cabinet duration data requires the use of a specific statistical tool, known as *event-history analysis* (or *duration analysis*). Such an approach was originally developed in biology and engineering and more recently it has been applied to the study of economic phenomena such as the duration of unemployment (Lancaster, 1979; Nickell, 1979; Taylor, 1999) or labour disputes (Kennan, 1985). Kiefer (1988) surveys several applications of duration models to economic problems.

The rest of this section is organised in two sub-sections. The first one contains a (short) presentation of the specific econometric method used for the analysis. In the second sub-section results of the analysis are discussed (Tables with all the econometric results are reported in Appendix 2).

Partial Likelihood estimation of the proportional hazards model

The history of a generic cabinet *i* in a multiparty democracy can be represented as a simple single-spell duration model known as "death process". This is a stochastic process X_t which takes its values in the discrete space $\{E_0, E_1\}$. At time $t = 0$ (the *birth date*) the process is in state E_0. Transition to state E_1 occurs just once in a lifetime at time τ (the *death date*). The state E_0 corresponds to the state "in office" for the incumbent government and the transition to state E_1 represents the termination of the cabinet. T, the time period spent in state E_0, is the duration of the cabinet and it is in the nature of a positive random variable.

Of particular interest for duration analysis is the probability that a spell will be completed at time $t + \Delta$, given that it has lasted until time *t*. Such probability is defined as:

$$(7) \quad l(t) = \lim_{\Delta \to 0} \frac{P\left[t < T < t + \Delta \middle| T \geq t\right]}{\Delta}$$

$\lambda(t)$ is called *hazard function* and it can be interpreted as the probability of observing a change of status at time *t* (namely, between *t* and $t + \Delta$).

The hazard function is used to characterise a process in terms of duration dependence. If the derivative of $\lambda(t)$ w.r.t. time, evaluated at $t = t^*$, is positive, then the process is said to exhibit positive duration dependence at t^*. If instead the derivative is negative, then the process exhibits negative duration dependence. The notion of duration dependence is quite important when considering cabinet duration. Positive duration dependence would imply that the probability of observing a termination at same point t^* increases the more distant t^* is from the birth date. This would mean that the longer a government has been in office, the more likely it is to terminate in the near future. On the contrary, negative duration

dependence would imply that the longer the tenure of the cabinet, the less likely it is to terminate in the near future.

The object of interest in the analysis of determinants of cabinet duration is the impact of explanatory variables (covariates) on the hazard defined in (7). A convenient way to specify the effect of covariates is through the so called *Proportional Hazard Model*. In the proportional hazard model, the hazard function at time *t* for an individual to whom the set *z* of covariates is associated can be specified as:

$$(8) \quad l(t;z) = l_0(t)\, y(z,b)$$

where $\lambda_0(t)$ is the baseline hazard function, ψ is a known function expressing the relationship between covariates *z* and (unknown) regression parameters β.[16] The set of covariates will include, for example, the effective number of parties in the coalition, the degree of polarisation of the legislature, the size of the conflict of interest among coalition partners and so on. The baseline hazard function $\lambda_0(t)$ is defined as the hazard function of the "representative" (or reference) cabinet; that is a cabinet for which either $z = 0$ or $E(z) = 0$.

The lack of information about the underlying distribution of failure time data makes it important to develop a flexible method of estimation. By flexible it is meant a procedure that does not require a functional form for the baseline hazard to be chosen *a-priori.* The Partial Likelihood method proposed by Cox (1972 and 1975) has this desirable property of flexibility and it is therefore convenient to use it for the analysis of cabinet duration data. With the Partial Likelihood (PL) method, the function ψ in model (8) is taken to be exponential, so that the hazard function can be written as:

[16]The above formulation assumes that covariates are time independent. Indeed, the covariates considered in this analysis all have the characteristics of being constant throughout the life of a cabinet.

(9) $\lambda(t;z) = \exp(z\beta)\lambda_0(t)$

The censoring mechanism is assumed to be independent from the failure mechanism. Moreover, the only information embodied in a censored observation is that the failure time of the censored cabinet is larger than the censoring time. In other words, censoring is assumed to be independent and non-informative. These assumptions are fully consistent with the nature of censoring of cabinet duration data as previously discussed.

The use of the PL function for the estimation of the parameters β in model (9) is based on the following argument. Consider the sequence of failure times t_1 < ..... < t_m. Let R_j denote the risk set at time t_j, that is; the set of all individuals still alive at time t_j. Assuming that there are no ties in the data and hence that only one failure is observed at t_j, the conditional probability that the generic item *k* in R_j fails at t_j is:

(10) $$\frac{\lambda(t_j;z_j)}{\sum_{k\in R_j}\lambda(t_j z_{(k)})} = \frac{\exp(z_j\beta)}{\sum_{k\in R_j}\exp(z_{(k)}\beta)}$$

where z_j is the value of *z* for the item failing at time t_j and $z_{(k)}$ is the value of *z* for the generic *k*th item.

Equation (10) represents the contribution of each failure time to the likelihood function. In addition to (10), the full likelihood should include the contribution steaming from the observation that between two successive failure times t_j and t_{j+1} no termination occurs. In other words, information about the parameters β should be inferred not only from the observation of failures occurring at times t_j , t_{j+1} , t_{j+2} ....., but also from the observation that in the interval [t_j , t_{j+1}) none of the items in the risk set fails. However, because the baseline hazard function is left completely arbitrary, one can account for this second bit of information simply by

taking $\lambda_0(t)$ to be very close to zero in the interval $[t_j , t_{j+1})$. In this way, no contribution needs to be registered from the observation that between any two failure times no termination is occurred. In the end, the likelihood is formed by taking the product over all failure times of (10) and it is in the nature of a Partial (not Conditional, not Marginal) Likelihood (Cox, 1975). Such PL function has the form:

$$(11) \quad L(\beta) = \prod_{j=1}^{m} \left(\frac{\exp z_j \beta}{\sum_{k \in R_j} \exp(z_{(k)} \beta)} \right)$$

Estimation of β then proceeds by maximising (11). This will require the use of the Newton-Raphson iterative procedure. Cox (1975) shows that under broad set of conditions, usual properties of maximum likelihood estimators extend to maximum "partial" likelihood estimators.

Equation (11) refers to a continuous case where no ties in the data occur. In the discrete case more than one failures at each failure time t_j might be observed. The PL can be written in such a way as to account for these ties:

$$(12) \quad L(\beta) = \prod_{j=1}^{m} \left(\frac{\exp(s_j \beta)}{\sum_{k} \exp(s_{(k)} \beta)} \right)$$

where s_j is the sum of z for all the l_j items failing at t_j; the sum is taken over $k \in R_{t_j, l_j}$.

A final note on the interpretation of the estimated coefficients. First of all, since the hazard indicates the likelihood of observing a cabinet termination, negative signs on coefficients indicate longer cabinet durations, positive signs indicate shorter durations. In addition to that, with the proportional hazards model, coefficients can be given partial-derivative interpretations, analogous to that given to regression

coefficients in the linear model. To see this, simply consider that when the model is formulated as in (9), the following relationship holds:

$$(13) \quad \frac{\partial \ln l(t;z)}{\partial z} = \frac{\partial \ln y(z;b)}{\partial z} = b$$

According to (13), when z is not time-dependent, its proportional effect on the hazard function is not dependent on duration and it is equal to β. Therefore, a one-unit change in a certain variable has an estimated effect on the hazard which is given by the estimated coefficient raised to the exponential power.

PL estimates of duration determinants and discussion.

Two sets of estimates are reported in Table A1 and A2 of Appendix 2. Table A1 refers to the estimation of a duration model using a sample of 369 cabinets formed (and terminated) throughout the period 1950-1995 in all the fourteen countries included in the political data set of Section 1. The duration variable is the *log* of the duration (expressed in days) of each cabinet. Results do not change significantly if the survival rate as defined by Woldendorp et al. (1993) is taken as the duration variable.

In Model 1 of table A1 only indicators that represent specific features of the coalition are entered as potential covariates. The share of seats controlled by the coalition, the extent of alternation, the time horizon at the moment of formation and lagged duration all have a significant positive effect on duration. The obvious interpretation for the role of the share of seats is that majority governments tend to last longer than minority governments. The positive impact of alternation can be explained in terms of an incentive effect. When alternation is high, the chances for parties in the incumbent coalition to be included in the next governing coalition are smaller; it is therefore less attractive for these parties to break the current

agreement and make the cabinet fall. The result concerning the time horizon suggests that the first cabinet of a legislature is expected to last longer than possible *subsequent* cabinets of the same legislature. However, since lagged duration increases government's survival, a "duration contagion"[17] effect is also at work and subsequent cabinets might benefit from it.

A significative negative impact on duration can be traced back to the effective number of parties (ENP) in the coalition and to the degree of total portfolio volatility (TPV). Indeed, in a more fragmented coalition (i.e. a coalition composed of a large effective number of parties) internal conflicts are more likely to arise, thus imposing a substantive constraint on the possibility of long durations. It is less straight-forward to explain the impact of total portfolio volatility. A possible argument goes as follows. With a high ministers turnover, each minister can accumulate only little knowledge of the working of its portfolios (i.e. bureaucratic structure, departmental activities, previously undertaken actions, and so on) and this can push her to carry out "wrong" policies (or maybe, "right" policies in the "wrong" way). Therefore, these mistakes made by individual ministers might threaten the survival of the cabinet as a whole and determine shorter durations.

Model 2 includes as covariates only variables which refer to the legislature as a whole. The rate of survival of the legislature has a strong positive effect on cabinet duration. Thus a more stable legislature seems to be able to generate a more stable cabinet. Not surprisingly, the degree of polarisation of the legislature strongly reduces cabinet duration. High polarisation is an indicator of fierce political competition. In such a difficult political environment, the chances to observe cabinet terminations are increased. Finally, the degree of concentration of the opposition does have a significant positive impact on duration. There are two ways in which this result can be interpreted. The first one is that a strong opposition may encourage coalition cohesion if coalition partners are afraid to let the opposition

[17] This term has been originally proposed by Strom (1988).

into power. The second one is that concentrated oppositions are more likely to act responsibly and play a constructive role in the process of policy formation, thus "supporting" the cabinet.

Model 3 combines the previous two models. In this "full" political model almost all coefficients retain the same sign they had in Model 1 and 2.[18] Of particular interest is the finding that the dummy variable for ideological location (*location*) has a significant negative coefficient. To interpret this result, recall that the dummy takes value one for cabinets located to the right of the median value 5.5 on the ideological space [1, 10] and that a negative coefficient reflects a positive impact on expected duration. Therefore, the model suggests that "right-wing" coalition tend to last longer than "left-wing" coalitions.

Table A2 reports estimate of politico-economic models of duration. That is, some economic variables have been added to the purely political specifications of Table A1. The theoretical literature on the *political business cycle* and the *partisan business cycle*[19] makes use of models based on the expectations augmented Phillips curve to formalise the interactions between economic and political cycles. It is therefore reasonable to consider inflation and production as the two economic variables which are most likely to influence cabinet duration. Unfortunately, the monthly series of the Consumer Price Index (CPI) and the Industrial Production Index (IP) made available by IMF/International Financial Statistics do not cover the whole period 1950-1995 for all the 14 countries in the political data-set. Therefore, the sample used to estimate the politico-economic models of duration has to be restricted to 173 observations.

Model 4 of Table A2 is the full political model re-estimated for the smaller sample. For some of the variables, results are quite different from those obtained in Model

[18] The only exceptions concern the variable measuring the cumulative duration of all previous government headed by the same Prime Minister (*cumulative prime minister*) and the compatibility index. However, both are largely insignificant.

[19] See Alesina, Roubini and Cohen (1997) for a survey of contributions in this field.

3 of Table A1. However, for some other variables results are quite robust: the potential time left at the moment of formation, the rate of survival and the degree of polarisation of the legislature retains their significance as well as the sign of their effect. In addition, two new variables become significant: the degree of conflict of interest and the compatibility index both act in the sense of reducing duration. High values of the compatibility index are indicators of low compatibility between portfolios allocation and preferences expressed by voters (in the sense specified in Section 1). Thus the negative impact on duration should not be surprising. Similarly, high values of the index of conflict of interest imply significant ideological differences between coalition partners. Again, such ideological diversity is likely to cause early terminations.

In Model 5 of table 2 the "levels" of industrial production and inflation are included as covariates. This does not significantly alter the sign and the significance of the political variables. Moreover, with the exception of polarisation, the size of the coefficients of the five political variables which are strongly significant in the full political model are not changed dramatically. The estimated coefficients of the two economic variables are as expected. Higher inflation acts in the sense of shortening duration, whilst higher industrial production increases the chances of survival. This result implies that cabinet's survival cannot be taken as being independent from economic performance. In particular, the assumption (common to most models of political and partisan business cycle) that poor economic performance (i.e. high inflation, low production) will represent a burden for the incumbent only at the time of next elections is too restrictive: poor economic performance is a liability the incumbent might be called to pay for even before the constitutionally established term of office has expired.

In Model 6 together with the levels of inflation and industrial production, the volatility of inflation (measured as the standard deviation of inflation) and the growth rate of industrial production are entered the full specification. In fact, these two variables do not seem to add very much to the explanatory power of the

model. The relative large standard errors reported in the table implies that the coefficients are not very precisely estimated.

Finally, Model 7 of Table 2 is aimed at testing whether or not the significant impact of economic variables (expressed in levels) on duration is robust to institutional differences across countries. For this purpose the three institutional dummy variables presented in Section 1 are added to the specification. The dummy *legislature* takes value one if the legislature can dismiss itself. The negative sign of the estimated coefficient suggests that when such power is afforded to the legislature, the duration of the cabinet is increased. The dummy *government* takes value one if the government has the power to dismiss the legislature. As one would expect, when such power is granted to the cabinet, the cabinet's probability of survival increases. The existence of a formal investiture procedure (captured by the dummy *investiture*) is on theoretical grounds less important for cabinet duration and more relevant for the duration of the process of cabinet formation. The low significance of its coefficient does confirm this theoretical point. In general, results concerning the other political and economic variables are robust to adding institutional dummies to the model.

Finally, the issue of time dependence can be addressed by looking at the curvature of the *integrated hazard function.* The integrated hazard is defined as:

$$(14) \quad \Lambda(t) = \int_0^t \lambda(u)du$$

When plotted against duration, the integrated hazard function will be convex if the hazard function is increasing w.r.t. time; that is, if there is positive duration dependence. If instead the integrated hazard is concave, then the hazard function is decreasing with duration and thus there is negative duration dependence. In all the models of Table A1 and A2, plots of the integrated hazard (not reported) show a clear positive duration dependence. As already pointed out, positive duration dependence implies that the longer a cabinet stays in office, the higher the

probability it will collapse in the near future. This very same result has been found by Merlo (1998) in his analysis of cabinet duration in Italy.

Section 3. Political determinants of government consumption expenditure.

The idea that political instability has significant impact on the size and the composition of government expenditure and, via government expenditure, on the overall economic performance of the system is incorporated in several models (Darby, Li, Muscatelli, 1998; Alesina Perotti and Tabares, 1998; Sachs and Roubini, 1989). The political data set presented in Section 1 allows for a systematic analysis of political determinants of government consumption expenditure. Of course, government consumption is likely to be determined not just by political factors, but by economic and environmental factors as well. For this reason, the panel models of Tables A3 and A5 include three "control" variables: (i) the fertility rate (in log-form), (ii) the enrolment rate in higher education, (iii) the level of per-capita real GDP, adjusted for changes in the terms of trade. The first is meant to capture the effect of a growing population on the size of public consumption and current social expenditure. The second-one is intended as a proxy for the demand of education infrastructure (which are often provided by the government). Finally, the level of per capita GDP is used as indicator of wealth: in richer countries government expenditure should be higher, other things being equal.[20]

The dependent variable is the ratio of real government consumption expenditure to real GDP observed in each of the 14 countries of the political data set over the sample period 1965-1990. All data are averaged over periods of five years. For political variables, a weighted average is computed as follows. Each cabinet which

[20] Data on fertility are taken from various issues of the Statistical Yearbook of United Nations, the enrolment rate is taken from the Barro and Lee data set (1993) and the data on the level of real per-capita GDP are from Summer and Heston (1991).

stayed in office over a fraction of each quinquennium is assigned a weight equal to the ratio of its duration (in days) to the total number of days in a quinqiennium (i.e. 1800). For cabinets that stayed in office across two successive quinquennia, only the fraction of duration falling in the quinquennium of interest is used to determine the weight. Once weights are determined, the political measures for each country in each quinquennium are simply the weighted average of the data observed for each cabinet in office for any fraction of the quinquennium. Exceptions to this procedure are made for the measures of portfolio volatility (Total Portfolio Volatility, Party Portfolio Volatility and Ideological Portfolio Volatility). For such measures simple rather than weighted averages are computed.[21] The measures of general instability and partisan cabinet instability are obtained by counting the number of cabinet terminations and changes in the partisan composition of the cabinet occurred over each quinquennium and then dividing by 5 (so to obtain a yearly average over the quinquennium).

The set of results in Table A3 refers to OLS estimation of the model. Model 1 of Table A3 is a full politico-economic model, where all political variables plus the three control variables are entered[22]. A few intriguing findings are worth mentioning. First of all, the three control variables all have positive and significant coefficients, as one would expect. Turning to the political variables, three of them seem to have a particularly significant impact. Cabinet duration acts in the sense of increasing government expenditure whilst both the share of seats controlled by the coalition and the dummy for ideological location have a negative sign. The inverse relationship between share of seats and government consumption is consistent with

[21] The reason for this special treatment has to do with the specific nature of the three variables. Portfolio volatility is observed only once, at the moment of formation of the new cabinet. Instead, measures such as the effective number of parties in the coalition represent situations which are observed continuously at any moment of the life of the cabinet. Therefore, it seems more plausible to give the latter a weight as a function of the time the government stays in office, whilst portfolio volatility measures are better represented by simple average.

[22] In fact, not all the political variables of the data set are entered as regressors. The reason for that is that some of them tend to be highly correlated and thus problems of multicollinearity might arise.

the findings reported by Darby, Li and Muscatelli (1998). Indeed, theoretical models predict that the share of seats controlled by the coalition, being an indicator of political stability, should work in the sense of limiting the level of government consumption. An analogous argument should apply to cabinet duration. To the extent that it is possible to interpret duration as an indicator of stability, one would expect lower government consumption associated to longer duration. The positive sign of the coefficient of cabinet duration in Model 1 suggests that some other effect is at work. In particular, it might well be possible that the ability or the incentive "to spend" of cabinet ministers increases with tenure, thus making the relationship between duration and government consumption positive. The finding that the dummy for ideological location has a negative coefficient is very interesting. It means that "left-wing" government effectively tend to increase government consumption relatively to "right-wing" government.

Model 2 is the politico-economic model re-estimated with OLS after dropping the variables that in Model 1 resulted highly insignificant. Now both the survival rate of the legislature and the survival rate of the cabinet have significant negative coefficients. This result is in contradiction with the finding that duration has a positive impact on government consumption. This can probably be interpreted as a further confirmation that, with regard to the time dimension of political instability, several alternative mechanisms of influence on the process of policy formation are at work. The negative sign of the coefficient of total portfolio volatility, however, seems to support the idea that the ability to spend of ministers might be positively related to tenure (or inversely related to turnover). The null hypothesis of zero restrictions on the coefficient of the measure of fragmentation and the measure of concentration of the opposition cannot be rejected at usual confidence level. Therefore, Model 2 has been re-estimated after deleting such two variables, yielding Model 3 in Table A3. Some additional specification tests are reported in Table A4.

Table A5 contains Instrumental Variables estimation of Model 2 (without the index of concentration of the opposition) and Model 3 in Table 3. There are good reasons to believe that the three control variables might be endogenous. Therefore, lagged values of the fertility rate, the enrolment rate in higher education and the real per-capita GDP are used as instruments. It can be noticed that the main results obtained with simple OLS still hold.

Conclusion.

The two econometric applications suggested in this paper are an example of the vast range of possible applications for the political measures included in the data set presented in Section 1. Some interesting results have been obtained.

The duration analysis of Section 2 shows that the probability for a government to collapse increases the higher the degree of ideological heterogeneity of coalition partners, the higher the degree of polarisation of the system, the lower the rate of survival of the legislature, the shorter the time horizon to next mandatory elections and the worse the overall economic conditions of the country. There is also evidence of positive duration dependence: the longer the cabinet has stayed in power, the higher the probability it will collapse in the near future.

The panel analysis of Section 3 suggests that once controlling for some economic and environmental variables, political variables do have an impact on government spending decisions. In particular, the ideology of the coalition matters: with left-wing cabinets the level of government consumption expenditure tends to be higher than with right-wing cabinets. Another intriguing finding is that higher portfolio volatility reduces government consumption expenditure. This result supports the view that the ability of individual ministers to obtain resources for their department increases with ministers' tenure.

Appendix 1. Left-Right ideological scales: sources and methods.

To compute the measures of conflict of interest, polarisation and ideological portfolio volatility, empirical policy scales reporting the cardinal location of parties on the left-right ideological continuum are needed. The construction of such scales is usually based on either the analysis of electoral manifestos or country experts' judgement. In both cases the purpose is to collect information concerning the ideological orientation of parties on different, relevant dimensions of the policy space and then summarise such information by assigning each party a cardinal location on a unidimensional space (the left-right scale). Obviously such an exercise has some intrinsic limitations, especially if the policy space consists of several, heterogeneous dimensions. A party might well decide, for example, to be "liberal" with regard to the cultural-linguistic dimension, but "conservative" with regard to the economic dimension. Both the cultural-linguistic and the economic dimension are likely to be relevant and they should both contribute to determine the overall position of the party on the unidimensional left-right continuum. A system of weights has to be used in such case, but especially for scales based on experts' judgements, the choice of what weights to use might be arbitrary and conditioned by historical experiences of coalitions. However, two factors contribute to rise the degree of reliability of information obtained from the empirical policy scales available in the literature. First of all, some authors (Laver and Shepsle, 1996b) note that party locations on different dimensions of the policy space tend to be positively correlated. This means that cases of parties which are "liberal" on some issues and "conservative" on some other issues are more the exception than the norm. Second, there is still some wide agreement over the importance of the economic dimension as the one involving the basic issues that divide left from right (Huber and Inglehart, 1995). Thus, even if the number of dimensions composing the policy space is large, the economic orientation of the party can be taken as being the key indicator of the ideological position of the party itself. These are definitely good news for those economists who use empirical policy scales to analyse the interaction between politics and economics.

Several empirical left-right scales are available in the literature. Since parties tend to re-locate over time, it is convenient to make use of scales produced at different times and to partition the post-war era so that the position of each party at a given time is taken from the scale produced in the proximity of that time. Four basic sources are considered: Dodd (1976), Browne et al. (1984), Castles and Mair (1984), Huber and Inglehart (1995). In addition to those, some country-specific sources (such as Hardson and Kristens, 1987) are sometimes used to fill gaps left in the four main sources. All scales are converted into a continuum spanning from 1 (extreme left) to 10 (extreme right). The two points 2.5 and 8.5 are used as thresholds to identify extremist parties. These thresholds have been chosen on the basis of the discussion in Dodd (1976). Dodd explicitly reports that extremist parties on his scales are located either to the left of -5 or to the right of +5. Converting the locations -5 and +5 onto the continuum spanning from 1 to 10 one obtains 2.5 and 8.5. The median 5.5 is used as threshold to divide "left-wing" from "right-wing" coalitions and to construct the ideological dummy variable.

The advantage of using different scales to cover different fractions of the whole sample period can be illustrated with an example. In Italy commentators almost unanimously recognise that the PSI (Socialist Party) has experienced over the post-war era a significant ideological re-location from the left towards the centre. Such re-location has been witnessed by the increasing importance of the role of PSI as a coalition partner of DC (Christian Democrats). Throughout late '70s, '80s and early '90s (until the dissolution of the old party system), PSI has constantly remained member of the broad government coalitions built around DC, often receiving important cabinets and holding the prime-ministership three times.[23] The re-location process engaged by the PSI and its effects on the structure of Italian coalitions and, more generally, Italian politics would not be fully accounted for by the measures included in the political data set if a unique policy scale (possibly obtained by applying discriminant analysis to the four main sources previously mentioned) were used. In such a case, in fact, the location of parties would be assumed constant thorough time. Instead, by using the Dodd's scale for the first sub-period (1945-1975), then the Castle and Mair's scale for the second sub-period (1975-1990) and then the Huber and Inglehart's scale for the third period (1990-1998), the ideological location of PSI used as the basis for the computation of measures of conflict of interest and ideological portfolio volatility gradually moves from 3.5 to 3.8 to 5, consistently with what has been observed in the political arena. The same approach of "partition" of time has been used for all countries, so that in general, parties re-location should be consistently captured by the indices in the data set.

All information regarding ideological location of parties is contained in 14 "matrices of ideology" (one for each country). Each of such matrices is of size $n*k$, where n is the number of parties with parliamentary representation in at least one of the post-war legislatures and k is the number of post-war cabinets. These matrices thus provide a complete overview of the ideological locations occupied by all parties involved in national politics in each of the fourteen countries of the sample.

[23]The importance of this event is clear if one considers that until 1993, 51 cabinets were formed in Italy. In 46 out of these 53 cases the prime-minister was a Christian Democrat and the only two parties able to obtain the prime-ministership other than DC were PSI and PRI.

Appendix 2. Econometric results.

Table A1: Partial Likelihood estimates of political models of cabinet duration.

covariates	*Model 1*	*Model 2*	*Model 3*
share of seats	-3.0685 (.8567)		-1.7887 (1.023)
ENP	0.20908 (.0913)		.46546 (.16559)
alternation	-.47639 (.2799)		-.53085 (.3157)
TPV	.02198 (.01066)		.00518 (.01108)
IPV	-.1057 (.08043)		.03720 (.08574)
opposition		-.8946 (.42316)	-.75709 (.4587)
compatibility	-.4473 (.81900)		.57322 (.80071)
conflict of interest	.14556 (-.9535)		.06331 (.1008)
time horizon	-1.714 (.27314)		-2.952 (.34228)
fragmentation (legisl.)		-.09159 (.0643)	-.2761 (.11654)
parliamentary vol.		.28425 (.75670)	.77845 (.88024)
polarisation		3.0770 (.58552)	1.6179 (.65707)
survival (legisl.)		-2.6205 (.2923)	-4.287 (.38070)
location	-.1066 (.13206)		-.2860 (.14202)
lagged duration	-.1594 (.06799)		-.1742 (.07263)
cumulative coalition	-.0183 (.01965)		-.0075 (.02059)
cumulative p.m.	-.0017 (-.0190)		-.0104 (.01976)

Notes: Duration variable is (log) duration; standard errors in brackets. There are 369 observations in the sample. Sample period is 1950-1995.

Table A2: Partial Likelihood estimates of political-economic models of cabinet duration.

covariates	*Model 4*	*Model 5*	*Model 6*	*Model 7*
share of seats	.210 (1.7264)	.3215 (1.719)	.3175 (1.773)	.2722 (1.760)
ENP	-.006 (.2797)	-.0108(.2683)	.0117 (.2728)	-.0697(.2792)
alternation	.358 (.5444)	.0085 (.5729)	.7103 (.5779)	.3003(.6110)
TPV	.002 (.0180)	.0241 (.0201)	.0223 (.0203)	.0142 (.0207)
IPV	-.179 (.1445)	-.1530(.1443)	-.168 (.1458)	-.1628(.1472)
opposition	-.515 (.8675)	-.6042(.8604)	-1.018 (.908)	-.8191(.8916)
compatibility	2.241(1.297)	2.420 (1.365)	2.236 (1.361)	2.232 (1.432)
conflict of interest	.357 (.1998)	.3926 (.2105)	.4434 (.2048)	.5808 (.2274)
time horizon	-2.117 (.465)	-2.000 (.475)	-1.930(.4787)	-1.956 (.479)
fragmentation	-.039 (.1900)	-0.213(.1849)	-.0431(.1894)	-.0524 (.206)
parliamentary vol.	-1.171(1.39)	-.5959(1.396)	-.8399(1.454)	-.9469(1.539)
polarisation	3.137 (.9640)	2.318 (1.069)	1.721 (1.158)	2.068 (1.149)
survival (legisl.)	-4.046(.589)	-4.133 (.588)	-4.145(.5831)	-4.165(.6263)
ideological locat.	-.098 (.2281)	-.0796 (.238)	-.0832(.2390)	-.1396(.2521)
lagged duration	-.031 (0.115)	.0445 (.1211)	.0408 (.1199)	-.0720(.1216)
cumulative coal.	-.029 (.0301)	-.0269(.0307)	-.0112(.0328)	-.0278(.0313)
cumulative p.m.	-0026(.032)	.0197 (.0328)	.0176 (.0329)	.0142 (.0337)
inflation		.5542 (.3310)	.8698 (.4035)	.5906 (.3329)
industrial prod.		-.9186(.3472)	-1.067(.6575)	-1.093(.3729)
volatility infl.			-.9387(.6575)	
growth ind. prod.			-.0259(.0767)	
legislature				-.9209(.5481)
government				.3956 (.3815)
investiture				.0418 (.3151)

Notes: duration variable is (log) duration, standard error in brackets. There are 173 observations in the sample, the sample period is 1950-1955. The variable *fragmentation* refers to the fragmentation of the legislature.

Table A3: Determinants of government consumption expenditure. OLS estimates.

regressors	*Model 1*	*Model 2*	*Model 3*
intercept	-.6197 (.1640)	-.5557 (.1352)	-.5592 (.1435)
fertility rate	.0750 (.0174)	.0692 (.0144)	.0651 (.0150)
higher enrolment	.0726 (.0298)	.0901 (.0248)	.0968 (.0237)
per-capita GDP	.0749 (.0164)	.0650 (.0142)	.0670 (.0152)
share of seats	-.1224 (.0400)	-.1011 (.0298)	-.0977 (.0292)
opposition	.0350 (.0249)	.0234 (.01988)	
compatibility	-.0041 (.0301)		
conflict of interest	.0036 (.0033)		
ideological locat.	-.0125 (.0046)	-.0127 (.0049)	-.01078 (.0050)
duration	.0451 (.0160)	.0237 (.0074)	.0256 (.0066)
survival (cabinet)	-.0743 (.0463)	-.0465 (.0178)	-.0498 (.0175)
time left	-.0239 (.0198)		
time horizon	.0106 (.0647)		
fragmentation	.0046 (.0030)	.0031 (.0023)	
survival (legisl.)	-.0510 (.0277)	-.0476 (.0171)	-.0439 (.0168)
polarisation	-.0179 (.0356)		
TPV	-.0106 (.0074)	-.0138 (.0057)	-.0132 (.0056)
IPV	-.0017 (.0030)		
general instability	.0103 (.0126)		

Notes. The dependent variable is the ratio of real government expenditure to real GDP (source: Barro and Lee, 1993). Estimation is by Ordinary Least Squares, White's Heteroscedasticity adjusted Standard Errrors are in brackets. The panel consists of 14 countries observed throughout 1965-1990. Data are averaged over periods of five years, so that for each country 5 observations are available and a total of 70 observations are available. The variable *fragmentation* refers to fragmentation of the legislature.

Table A4: Variable addition tests

Additional variables	*Lagrange Multiplier statistic*	*Likelihood Ratio statistic*
ENP	.57284 (.449)	.57519 (.448)
compatibility	.069398 (.792)	.069432 (.792)
conflict of interest	.25133 (.616)	.25178 (.616)
time left	1.4763 (.224)	1.4921 (.222)
polarisation	1.0546 (.304)	1.0626 (.303)
general instability	.090221 (.764)	.090279 (.764)

The basic specification is the one of Model 2, Table A3. The null hypothesis is stated as a zero restriction on the coefficient of each of the additional variables listed above. Thus, variable should be added to the basic specification if the test statistic is sufficiently high (and the null can be rejected). P-values are reported in brackets. As it can be seen from the values reported in the second and in the third column, for none of the additional variables, the null hypothesis can be rejected at usual confidence levels.

The joint test of zero restrictions on the coefficients of the two variables *opposition* and *fragmentation of the legislature* yields the following results: Lagrange Multiplier Statistic 2.5096 (.285); Likelihood Ratio Statistic 2.5557 (.279). Again, the null hypothesis cannot be rejected and hence the two variables can be deleted. Model 3 in Table A3 is Model 2 re-estimated after deleting the two variables.

Table A5: Determinants of government consumption expenditure. Instrumental Variable estimation.

regressors	*Model 4*	*Model 5*
intercept	-.51734 (.17573)	-.53026 (.17445)
fertility rate	.059094 (.018532)	.060399 (.018486)
higher enrolment	.096564 (.024990)	.063857 (.018087)
per-capita GDP	.061676 (.018363)	.10150 (.024092)
share of seats	-.10102 (.029122)	-.097709 (.028577)
ideological location	-.011133 (.0048501)	-.010534 (.0050324)
duration	.027143 (.0059766)	.025944 (.0061116)
survival (cabinet)	-.051949 (.016555)	-.050602 (.016971)
fragmentation (legisl.)	.0019982 (.0019800)	
survival (legislature)	-.043272 (.016227)	-.043201 (.016457)
TPV	-.014381 (.0058532)	-.013155 (.0058275)

Notes. Dependent variable is the ratio of real government consumption expenditure to real GDP (source: Barro and Lee, 1993). Estimation is by Instrumental Variables. Lagged values of the fertility rate, per-capita GDP and higher enrolment rate are used as instruments. Political variables are used as their own instruments. White's Heteroscedasticity adjusted Standard Errors reported in brackets. The sample size is 70 observations (see Notes to Table A3 for further details).

References.

Alesina, A. and A. Drazen (1991). "Why are Stabilisation Delayed". *American Economic Review, 81, 1170-1185*

Alesina, A. , R. Perotti, J. Tavares (1998) "The Political Economy of Fiscal Adjustments", *Brookings Papers on Economic Activity, 1, 197-226.*

Alesina, A. N. Roubini and G. Cohen (1997) Political Cycles and the Macroeconomy, The MIT Press.

Axlerod, R. (1970) Conflict of Interest Theory, Cambridge University Press.

Bellettini, G. (1998). "Aggregate Uncertainty, Political Instability and Income Redistribution", *European Journal of Political Economy, 14, 19-33.*

Browne, E.C. , D. Gleiber and C. Mashoba (1984) "Evaluating Conflict of Interest Theory: Western European Cabinet Coalitions, 1945-80", *British Journal of Political Studies, 14, 1-32.*

Calvo, G. and A. Drazen (1997). "Uncertain duration of reform: dynamic implications", *NBER Working Paper 5925*

Carmignani, F. (1999). "Theoretical Models of Bargaining over the Allocation of Portfolios in Coalition Governments", forthcoming *Quaderni del dipartimento di economia politica series, Universita' Cattolica del Sacro Cuore – Milano.*

Castles, F. and P. Mair (1984), "Left-Right Political Scales: Some Expert Judgements", *European Journal of Political Research, 73-88.*

Cox, D.R. (1972) "Regression Models and Life-Tables (with discussion)", *Journal of the Royal Statistics Society, 1972, B 34, 187-220.*

Cox, D.R. (1975) "Partial Likelihood", *Biometrika, 62 (2), 269-76*

Dalle Nogare, C. (1997). "Ideological Polarisation, Coalition Governments and Delays in Stabilisation", *University of Glasgow, Department of Economics Discussion Paper No. 9710*

Darby, J. , C.W. Li and V.A. Muscatelli (1998). "Political Uncertainty, Public Expenditure and Growth". *University of Glasgow, Department of Economics Discussion Paper No 9822.*

Deveraux, M. and J.F.Wen (1996). "Political uncertainty, capital taxation and growth". *Mimeo, University of British Columbia.*

Dodd, L.C. (1976) Coalitions in Parliamentary Government, Princeton University Press.

Greene, W.H. (1993) Econometric Analysis., 2nd ed., MacMillan.

Grofman, B. and P. Van Roozendaal (1997) "Review Article: Modelling Cabinet Durability and Termination", *British Journal of Political Studies, 27, 419-451.*

Huber, J.D. (1998). "How Does Cabinet Instability Affect Political Performance ? Portfolio Volatility and Health Care Cost Containment in Parliamentary Democracies", *American Political Science Review, Vol.92, No. 3.*

Huber, J.D. and R. Inglehart (1998) "Expert Interpretations of Party Space and Party Locations in 42 Societies", *Party Politics, 1, 73-111.*

Laasko, M. and R. Taagepera (1979) "Effective Number of Parties: A Measure with Application to West Europe", *Comparative Political Studies, 12, 3-27.*

Katz, P. and P. Mair (1990). Party Organisations.

Keesing's Archive Publication (1985) Political Parties of the World.

Kennan, J. (1985) "The Duration of Contract Strikes in U.S. Manufacturing", *Journal of Econometrics, 28 (1), 5-28.*

Kiefer, N.M. "Economic Duration Data and Hazard Functions", *Journal of Economic Literature, Vol XXVI, 646-679.*

Koele, R. and P. Mair (eds.) "Political Data Yearbook", *European Journal of Political Research*, various issues.

Lancaster, T. (1979) "Econometric Methods for the Duration of Unemployment", *Econometrica, 47 (4), 939-56.*

Laver, M. and N. Schofield (1990) Multiparty Government, Oxford University Press.

Laver, M. and K.A. Shepsle (1996a). Making and Breaking Governments, Cambridge University Press.

Laver, M. and K.A. Shepsle (1996b). Cabinet Ministers and Parliamentary Governments, Cambridge University Press.

Mackie, T. and R. Rose (1991) The International Almanac of Electoral History, MacMillan.

Mackie, T. and R. Rose (1997) A decade of Election Results: updating the international almanac, Centre for the Study of Public Policy, Strathclyde University.

Merlo, A. (1998) "Economic Dynamics and Government Stability in Post-war Italy", *The Review of Economics and Statistics, 629-637.*

Nickell, S.J. (1979) "Estimating the Probability of Leaving Unemployment", *Econometrica, 47 (5), 1249-66.*

Persson, T. and G. Tabellini (1998). "Political Economics and Macroeconomic Policy", forthcoming in J.Taylor and M.Woodford (eds.), Handbook of Macroeconomics, Amsterdam:North-Holland

Powell, B. (1982) Contemporary Democracies, Cambridge, MA: Harvard University Press.

Roubini, N. and J. Sachs (1989) "Government Spending and Budget Deficits in the Industrialised Countries", *Economic Policy, 8, 99-132.*

Strom, K. (1984) "Party Goals and Government Performance in Parliamentary Democracies", *American Political Science Review, Vol. 79.*

Strom, K. (1988) "Contending Models of Cabinet Stability", *American Political Science Review, 82, 923-930.*

Taylor, M.P. (1999) "Survival of the Fittest ? An Analysis of Self-employment Duration in Britain", *Economic Journal, C140.*

Taylor, M. and M. Laver (1973) "Government Coalitions in Western Europe", *European Journal of Political Research, 1, 205-248.*

Warwick, P. (1992) "Ideological Diversity and Government Survival in Western European Democracies", *Comparative Political Studies, 25, 332-361.*

Woldendorp, J. , H. Keman and I. Budge (1993) "Political Data 1945-1990. Party Government in 20 Democracies", *European Journal of Political Research, 24, 1-119* and "Party Government in 20 Democracies: an update (1990-1995), *European Journal of Political Research, 33, 1998.*