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Lack of consensus, dispersion of political power and public debt: evidence from a sample of developed countries

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Abstract:

The aim of this paper is to study empirically the relationship between political governance and public debt by testing a number of hypotheses. We examine the effects of the dispersion of power on public debt from an econometric study carried out on a sample of thirteen developed countries for macroeconomic and political data covering the period 1996 - 2012. It comes out that the lack of consensus between the political parties in the government coalition and the dispersion of power within the government are factors explaining the increase in public debt.

Keywords: Public debt, political governance, democracy, public choice, power.

JEL classification: D7, H11

1. Introduction

Sometimes, in order to form a government, the political party that wins an election is forced to build a coalition with other parties in order to secure the support of parliament. Without the formation of a coalition, the parties will not be able to govern and freely implement their economic, political and ideological programs. Whether or not to join a coalition to form a government depends to a large extent on the goals of political parties and their ideological flexibility. Potential members of a coalition would agree on some goals and differ on others. According to Leiserson (1966), forming a coalition leads to bargaining among potential members of that coalition where parties often face a dilemma of whether or not to compromise the party's ideological position. From the outset, each party is under pressure from contradictory forces. The first of these forces is the desire to have good relations with other

potential coalition parties. The second force is the goal of seeing one's own orientations dominate the coalition's joint policies. The third force is the desire to maximize one's chances of re-election and/or to secure a lasting place in government. Taking into account these three contradictory forces, it is often difficult for parties, before or after the formation of the coalition, to homogenize their preferences and make their interests converge.

Once the coalition is formed, what divides the parties is their position on concrete policy issues.¹ If a government is formed by two or more parties, at least one of them must approve the implementation of a set of policies that do not necessarily correspond to its preferred set. Indeed, a governing coalition is likely to face many political roadblocks. Finding common ground on economic policy is not easy, especially if the parties' ideological positions are far apart. In such situations, compromises can only be made when the specter of an unfavorable outcome prompts each party to make concessions.² According to Downs (1957), a coalition can solve societal problems only when there is a tendency to integrate the policies of the coalition and a desire for mutual cooperation. In practice, this condition is rarely met. Most coalitions are made up of distinct parties that are ideologically or even diametrically opposed.³ In this case, the political parties make concessions and approve certain compromises in order to preserve some power and gain influence over the policies actually implemented.

The lack of consensus on fiscal or debt policy is a recurring phenomenon in coalitions.⁴ The difficulty of finding a compromise on policies can cause considerable economic and financial damage. Downs (1957) and Buchanan (1958) were among the first authors to attribute the increase in public debt to a failure of the democratic system; a democratic failure which is mainly linked to the opportunism of politicians and the myopia of voters. Politicians formulate policies only to maximize electoral chances by implementing policies that are strongly desired by voters. The facts are that voters are more likely to support a politician who increases public spending more than one who raises taxes. Thus, the democratic system spontaneously leads to

¹ According to Riker (1962), since the gain to be shared in a coalition is the number of positions in government, the greater a party's political weight in the coalition, the more ministerial positions it will demand. Laver and Shepsle (1996) argue that each party in the coalition will attempt to control its ministries and implement desired policies.

² To remedy this problem, Axelrod (1970) noted that parties forming a coalition must be ideologically adjacent in order to agree on a set of common policies.

³ The 36th government of Israel is a recent example of this. It was a ruling coalition of eight parties that represent a wide range of ideological positions including two centrist parties (*Yesh Atid* and *Blue and White*), three right-wing parties (*Yisrael Beiteinu*, *New Hope* and *Yamina*), two left-wing parties (*Meretz* and the *Labour Party*) and the and the *United Arab List*.

⁴ One example is the "black-yellow" coalition led by Angela Merkel in Germany between 2009 and 2013. This coalition brought together the *Christian Democratic Union* (CDU) and the *Christian Social Union* (CSU), together forming the CDU/CSU, and the *Liberal Democratic Party* (FDP). Disagreements arose in this coalition over issues such as tax cuts and public spending. The FDP, being more economically liberal, wanted deeper tax cuts, while the CDU preferred more cautious fiscal policies to maintain the budget's stability. For more on this, please refer to Saalfeld and Zohlnhöfer (2014).

budget deficits and increased public debt. Since the work of Downs (1957) and Buchanan (1958), numerous theoretical and empirical studies have attempted to explain the possible links between variations in certain macroeconomic magnitudes, particularly variations in public debt, and governance or political structure. Roubini and Sachs (1989a,b), Alesina and Drazen (1991), and Spolaore (1993), among others, point out that pluralist or coalition governments are more prone to deficits because of conflicts of interest and disagreements over fiscal policy; this makes fiscal discipline more difficult to achieve since each political party demands "benefits" for its supporters as a condition for supporting the government. For Persson and Tabellini (1999), problems of coordination among coalition members have significant effects on deficit and debt: the more divided a coalition is, the greater the risk of public debt slippage. The main explanation would be that ruling parties have an unfortunate tendency to transfer budget adjustments to the next government, especially when there is little chance of re-election.

Roubini and Sachs (1989a,b), Alesina and Drazen (1991) also point out that in coalition governments, the dispersal of power among the parties slows down decision making, particularly with regard to deficit reduction; the delay in decision making results in fiscal stabilization costs that would in fact lead to an accumulation of public debt. In a coalition where political parties have equal power, budget negotiations are long and costly. Spolaore (1993) argues that in a majority government where only one political party dominates, the costs of fiscal adjustment are borne by the dominated parties; the dominant party is shielded from measures that would go against the interests of its voters. Measuring power dispersion using the Banzhaf index⁵, Huber et al (2003) reach the following conclusions: (i) a balanced coalition (where political parties have equal political weight or power) generates more deficits than an unbalanced coalition (where one or two parties dominate the coalition); (ii) the number of seats held in parliament by the ruling coalition is neutral with respect to the evolution of the deficit and public debt.

The objective of this paper is to study empirically the relationship between political governance and public debt by testing a number of hypotheses. Contrary to previous work, our analysis focuses not only on the dispersion of power within the government but also on the dispersion of power within parliament. The peculiarity of our empirical approach lies in the study of a relatively large number of different countries at the political and economic level with relatively recent macroeconomic and political data (1996 to 2012), a period very little studied in the literature. Our study includes the following thirteen countries: Austria, Belgium, Canada,

⁵ Banzhaf index (1965) measures the a priori power of political parties within a coalition or parliament.

Czech Republic, Finland, Germany, Greece, Hungary, Italy, Netherlands, Spain, Sweden, and the United Kingdom. We base our analysis on possible links between institutional characteristics and changes in central public debt on four main assumptions. *Firstly*, we seek to test the effect of the dispersion of power within the government on the central public debt. In other words, we want to verify whether the dispersion of power and coordination problems in a government coalition would or would not lead to more public debt. To do so, we determined the number of political parties in the government and measured the dispersion of power by calculating the actual number of political parties. The number of political parties in a parliament or government is most often explained by ethnic and ideological diversity and electoral rule (see Amorim and Cox, 1997; Clark and Matt, 2006; Cox, 1997; Duverger, 1954; Ordeshook and Shvetsova, 1994; Singer and Stephenson, 2009). *Secondly*, the total size of the government is another characteristic to be tested. The objective is to test whether the total number of government members is a factor in increasing the debt. In concrete terms, this variable implicitly tells us the number of ministries and the expenses of the different ministerial structures. *Thirdly*, we want to verify whether the variation in the central public debt is sensitive to the majority status of a government. In other words, is a majority government, holding more than 50 per cent of the seats in parliament, more likely to reduce public debt than a minority government? Is public debt an increasing or decreasing function of the percentage of seats held by a governing coalition? Fourth, we focus our attention on the dispersion of power in parliament and its repercussions on the variation of the central public debt. This dispersion of power measured by the effective number of political parties in parliament provides information on the imbalances that exist among political parties. It reflects the nature of parliamentary control. A country whose parliament is dominated by a single party is likely to have little effective parliamentary oversight. In such a configuration, government policies are approved almost unanimously in parliament. The government guides the decisions of parliament, which could weaken control over public debt.

The rest of the paper is organized as follows. Section 2 is devoted to the presentation of our data in accordance with the main assumptions underlying our analysis. In Section 3, we introduce our econometric model and present the estimation results. Section 4 draws some comments and concluding remarks.

2. Data and details

From a technical point of view, we have chosen to take into account only the characteristics of the government that has remained in power the most over the course of a year. Indeed, we believe that the government with the greatest control over the affairs of state is primarily responsible for the policies adopted. On the other hand, it is important to note that the policy variables explaining our dependent variable (the change in central government debt) are lagged by one year. For example, if the change in public debt is calculated between 2000 and 1999, then the policy variables taken into account concern the government that governed the most in 1999. This choice stems from the consideration of the time needed to implement a fiscal policy. The decisions taken by a government would only have an impact on the fiscal situation from at least the following year onward. In general, if new expenditures have been decided by the government in one year, they are allocated to the following year's budget. Thus, a delay of one year in taking into account the governmental characteristics seems reasonable to us (as well as for the parliament). Moreover, unlike the work of Roubini and Sachs (1989), we used central budget data. The advantage of these data lies in the neutralization of budgetary variations that are subordinate to the activity of any public body enjoying financial autonomy. Budgetary data from public authorities such as local authorities, town halls and social security administrations, which have their own financial management, are not taken into account in our central data.

In our study, the data are of two kinds: economic and political. Fiscal and macroeconomic data are derived primarily from World Bank and OECD databases. As for the data related to political variables, they were collected from the political databases « *Political Data Yearbook* », sorted and classified according to the objectives of our study. Our sample includes economic and political data from 13 countries (Austria, Belgium, Canada, Czech Republic, Finland, Germany, Greece, Hungary, Italy, Netherlands, Spain, Sweden, and the United Kingdom) over the period 1996 to 2012 (221 observations). Let us briefly present each of the selected variables. The variable to be explained is the variation of the central public debt as a percentage of GDP denoted by ΔDPC . We have chosen the change in the central public debt as the dependent variable and not the public debt ratio because we wish to study the impact of policy variables not only on the increase and decrease of the debt ratio but also on its rate of growth or decrease. This allows us to obtain more reliable and accurate results. But since we cannot distinguish econometrically between the increase in the ratio and the decrease in the rate of decrease, or between the decrease in the ratio and the decrease in the rate of growth, we will simply note that the public debt increases or decreases, even if sometimes it is the rate of growth or decrease in the ratio that is implicitly interpreted. The other explanatory variables (data) are presented in

Table 1 and grouped relatively to: *i) changes in fiscal variables as a percentage of GDP, ii) percentage changes in macroeconomic data and iii) political variables.*

All of the policy data refer to year t-1 in relation to the dependent variable (DPC) data in year t. In addition, the following policy data; PRC_IND, NBTOTMG, NBPPG, NBEFPPG, PRC_SGCPM refer to the government (coalition) that led the state the most during the year. In addition, we would like to provide more information on the effective number of political parties (in government or parliament).

The number of political parties sitting in parliament (NBPPPM) and the effective number of political parties sitting in parliament (NBEFPPPM) are both measures used to describe the level of fragmentation in a parliamentary system. NBPPPM is simply the total number of political parties that have representation in parliament. This measure can be useful in assessing the diversity of political perspectives and the degree of representation of various interests in the legislature. NBEFPPPM takes into account not only the number of parties, but also the relative strength of each party. It is calculated by taking the sum of the squared vote shares of each party represented in parliament, and then dividing that by the square of the total number of parties. The resulting value provides a measure of the effective number of parties that are truly represented in the legislature, accounting for the fact that larger parties have a greater influence on the legislative process.

At the government level, the effective number of parties depends on the relative power that each party in the coalition enjoys in terms of the number of ministers. For example, if a government is formed by three political parties and only two parties share almost all of the ministerial posts, then the effective number of political parties would be closer to two than three. If only one political party dominates the other two, then the effective number of political parties would be closer to unity this time. In other words, the greater the gap between the actual number and the effective number of political parties, the more unbalanced the coalition is (one would say that power is not dispersed). Conversely, the smaller the gap, the more evenly the political parties share power (dispersed power). This reasoning also applies to parliament based

on the number of seats held by each party. Laakso and Taagepera (1979)⁹ introduced an index to measure the actual number of parties. It is defined as follows: $NBEF = \frac{1}{\sum_{i=1}^n x_i^2}$ where x_i represents, in percentage terms, the share of ministerial positions (resp. seats) held by political

Table 1. Variables, abbreviations and their sources

Groups of variables	Abbreviation	Variable	Source
<i>Changes in fiscal variables as percentage of GDP</i>	ΔDPC	Variation of the central public debt as a percentage of GDP	World Bank ⁶ / OECD ⁷
	ΔREV	Public revenues	
	ΔSPD	Public spending	
	ΔCI	Central government interest expenses	
<i>Percentage changes in macroeconomic data</i>	ΔINFL	Rate of inflation	OECD ⁷
	ΔGDP	Rate of economic growth	
	ΔUER	Unemployment rate	
<i>Political variables</i>	PRC_IND	Percentage of independents in government	Political data yearbook ⁸
	PRC_SGCPM	Percentage of seats of the governing coalition parties in parliament	
	NBTOTMG	Total number of government members	
	NBPPG	Number of political parties in government	
	NBEFPPG	Effective number of political parties in government	
	NBPPPM	Number of political parties sitting in parliament	
	NBEFPPPM	Effective number of political parties sitting in parliament	authors' computations
	STRENGTH	Sum of Banzhaf indices of parties in government	
DISPERSION	Standard deviation of Banzhaf indices of parties in government		

party i in the government (resp. parliament) given n the total number of political parties present in the government (resp. parliament). The two last variables, STRENGTH and DISPERSION are drawn from Huber et al (2003).

⁶ <https://data.worldbank.org/>

⁷ <https://data.oecd.org/>

⁸ <https://politicaldatayearbook.com/>

⁹ See also Taagepera and Shugart (1989), Volkerink and De Haan (2001).

Let us say some few words on how these two variables are constructed. For some authors, including Sutter (2003), the share of seats held by a party in parliament is not a good proxy or measure of that party's power or ability to make or break governments; power indices would be the most appropriate tools for this. This argument is also shared by Huber et al (2003), who propose to measure the strength of a government and the dispersion of power within a coalition government by means of the normalized Banzhaf index also known as the Banzhaf-Coleman index (Banzhaf, 1965; Coleman, 1971).¹⁰ The normalized Banzhaf index compares the relative influence of different players in a coalition game. The higher a player's index, the more important he is for the outcome of the game, as he has more power to swing the outcome by joining different coalitions. Let us assume that the game involves at set N of n ($n \geq 2$) players (parties), each with a weight (number of seats in parliament) w_i ($i = 1, 2, \dots, n$) and that the minimum threshold for a proposal to be adopted is q . The voting system is defined by the list $[q; w_1, w_2, \dots, w_n]$. Any S subset of N is called a *coalition*; we denote by s the cardinality of S and by $S - \{i\}$ the coalition S without player i . Given q , a coalition will be said to have won if the sum of the weights of the agents in that coalition is greater than or equal to q . The characteristic function of the voting system $v(S)$ is defined as follows: $v(S) = 1$ if $\sum_{i \in S} w_i \geq q$ and $v(S) = 0$ otherwise. The normalized Banzhaf index of player i is calculated according to the following formula:

$$BI(i) = \frac{\sum_{S \subseteq N} [v(S) - v(S - \{i\})]}{\sum_{j \in N} \sum_{S \subseteq N} [v(S) - v(S - \{j\})]}$$

Huber et al. (2003) measure government strength vis-à-vis the opposition as the sum of the Banzhaf indices of all parties in government and the dispersion of power within governments by the standard deviation of voting power of parties in government. Government with lower values of strength will tend enhance higher debt accumulation through budget deficits. Coalitions with more or less equally strong parties will have lower values of dispersion, while this will be larger for coalitions with one predominant: in governments with a relatively higher power dispersion, one strong party can put pressure on the relatively weaker party (parties) in order to stabilize the budget. Huber et al. (2003) showed that government strength vis-à-vis the opposition has no significant effect on debt levels while the dispersion of power within coalition

¹⁰ The most popular power indices are the Banzhaf index (Banzhaf, 1965) and the Shapley-Shubik index (Shapley and Shubik, 1954). For an overview of other power indices that have been devised, the reader may refer to Felsenthal and Machover (1998), Holler and Owen (2001), Holler and Nurmi (2013).

governments is a significant predictor of deficit levels; more, coalition governments with about equally strong parties have higher deficits than governments consisting of one dominating party and one or more relatively weaker parties.

Table 2 presents, for each of the 13 countries in our sample, the averages of the changes in the economic variables. From this table, we see that the largest average change in central government debt is recorded in Greece (3.45); this result is far from surprising with the recent economic upheavals experienced by Greece. The lowest average variation is observed in Sweden (-2.71). On the other hand, the countries that have controlled their spending the most are Sweden, Germany and Finland. As for changes in interest expenses, they are all negative on average and this is explained by the effects of the monetary union on the financial markets, which had strengthened investor confidence and lowered interest rates. The small average changes in inflation rates are explained by the monetary policy of inflation targeting and stability adopted in Europe for at least two decades. The negative average variations in the economic growth rate are mainly due to the deterioration of the international economic situation between 2007 and 2012. As for unemployment, Finland has the lowest average variation (-0.45) while Greece has the highest average variation (0.88).

Table 2. Average changes in economic variables (%)

	ΔDPC	ΔREV	ΔSPD	$\Delta SDEBUD^{11}$	ΔCI	ΔINF	ΔGDP	ΔUER
Austria	1	-0.03	-0.22	0.17	-0.08	0.01	-0.10	0.03
Belgium	-1.95	0.03	0	0.02	-0.29	-0.08	0.13	-0.10
Czech Republic	1.67	-0.14	0.16	-0.08	0	-0.34	-0.41	0.17
Finland	-1.43	-0.12	-0.54	0.36	-0.13	0.10	-0.33	-0.45
Germany	1.17	-0.06	-0.54	0.47	-0.05	0.01	-0.07	-0.15
Greece	3.45	0.52	0.66	-0.03	-0.34	-0.43	-0.51	0.88
Hungary	-0.23	-0.08	-0.46	0.36	-0.26	-1.32	-0.17	0.04
Italy	0.53	-0.09	-0.33	0.25	-0.34	-0.12	-0.30	-0.05
Netherlands	-0.01	-0.01	-0.32	0.31	-0.16	0.03	-0.27	-0.11
Spain	0.62	-0.52	-0.20	-0.14	-0.10	-0.13	-0.28	-0.13
Sweden	-2.71	-0.34	-0.68	0.37	-0.23	-0.09	-0.25	-0.06
United Kingdom	2.91	0.18	0.25	-0.01	-0.02	0.00	-0.11	-0.04

¹¹ The budget balance is added to this table for the sole purpose of refining the interpretations of the data. This variable is not, of course, one of the explanatory variables.

Canada	-1.43	-0.13	-0.35	0.21	-0.24	-0.03	-0.06	-0.13
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Table 3 presents the means of the variations in the political variables. In this table, we note that the percentages of independents in governments are very low, except in Italy, where the percentage of independents averaged 0.21 (or 21%) during this period. Canada has large governments with an average of 27.7 members on average, while Austria has the smallest number of members with an average of 13.23. In terms of the number of political parties in government, Italy has an average of 5.64 political parties in its coalitions, while Greece, Spain and Canada use only one political party to lead the government. On the other hand, taking into consideration the effective number of political parties in government, it is clearly observable that Italy is the country with the most unbalanced governments, with an average effective number of political parties of 3.84 compared to 5.64 in real terms. This comparison is made by calculating the gap between the real and effective number of political parties in government.

Table 3. Averages of political variables

	PRC_ IND	NBTOT MG	NBPP G	NBEFP PG	PRC_SGC PM	NBPPP M	NBEFPP PM	STRENGTH	DISPERSION
Austria	0.02	13.23	2	2	0.61	4.58	3.46	0.63	0.01
Belgium	0.004	18.88	4.70	4.37	0.60	10.76	7.60	0.62	0.001
Czech Republic	0.11	15.70	2.47	2.28	0.92	5.11	3.82	0.45	0.03
Finland	0.02	18.11	4.35	3.38	0.65	8.47	5.06	0.66	0.02
Germany	0	15.64	2.58	2.04	0.56	6.23	3.70	0.65	0.06
Greece	0	20.17	1	1	0.53	4.41	2.01	0.98	0.47
Hungary	0.03	15.88	2.17	1.61	0.47	5.05	2.63	0.76	0.17
Italy	0.21	23	5.64	3.84	0.28	12.64	3.88	0.61	0.05
Netherlands	0	15.23	2.94	2.63	0.63	9.88	5.24	0.58	0.02
Spain	0	16.17	1	1	0.47	11	2.51	0.68	0.26
Sweden	0	21.64	1.88	1.59	0.43	7.05	4.07	0.55	0.13
United Kingdom	0	22.58	1.11	1.06	0.59	11	2.30	0.88	0.42
Canada	0	27.70	1	1	0.50	4.47	2.80	0.80	0.36

For the other countries, the gap is not so glaring and there is a relative balance between the political parties forming the coalitions. In terms of the percentage of coalition seats in parliament, it is notable that most countries have majority governments on average. However, Hungary, Spain and Sweden are on average slightly below 50 per cent, while Italy is far behind with 28 per cent on average. The Czech Republic is the only country with a percentage close to 100% on average.

In terms of the number of political parties in parliament, Italy, Belgium and the Netherlands have the most diverse parliaments with a number of political parties close to ten parties. The proportional electoral system in all three countries explains this diversity in parliament. Conversely, Greece, Austria and Canada have parliaments formed by a small number of political parties. Nevertheless, if we look at the actual number of political parties in parliament, another observation emerges: Italy, Spain and Britain have the most unbalanced parliaments in terms of the number of seats held by each political party; conversely, Austria, Canada and the Czech Republic have more balanced parliaments (dispersed power), i.e. parliaments that are not dominated by one or two political parties.

In terms of power index (STRENGTH), Table 2 shows that, with the exception of the Czech Republic, ruling governments (coalitions) control more than 50% of parliamentary power on average, with Greece approaching 100%. A comparison of the STRENGTH and PRC_SGCPM variables reveals that in some countries, a high share of seats in parliament does not necessarily correspond to a high STRENGTH index, which can be relatively low, as in the Czech Republic, while the opposite is true in Italy. The scores of the variable DISPERSION reflect the dispersion of power within the ruling coalition. The closer this score is to 0, the closer the parties within the governing coalition have STRENGTH indices (or equal STRENGTH indices). The DISPERSION scores recorded for the UK, Greece and Canada reflect the tendency in these countries to have a majority party in power, or a coalition in which a strong party is present.

Table 4 focuses on the correlations between political variables. This table in turn confirms the existence of links between the political variables. We propose to comment on some of them. First, the strongest correlation is observed between NBPPG and NBEFPPG, which is not surprising. Second, there is a correlation, not unimportant, between NBEFPPM and NBEFPPG: the more balanced the parliament is in terms of the number of seats held by each party, the more evenly power is distributed in government. In other words, the absence of a dominant party in parliament leads to a wider dispersion of power within the government.

Finally, the NBPPG is relatively correlated with the NBPPPM. Obviously, any political party in parliament wishes to be represented in government to defend the party's objectives and interests. We also note that the variables STRENGTH and DISPERSION, while positively correlated with each other and with the variable NBTOTMG, are negatively correlated with each of the other political variables. The positive correlation between STRENGTH and DISPERSION and the NBTOTMG variable can be explained by the fact that a large size of government is often the consequence of the number of parties that have agreed to support the formation of a coalition government; this support is most often translated into the granting of offices. The more parties there are in the coalition, the more power can be dispersed.

Table 4. Correlations of political variables

	PRC_IND	NBTOTMG	NBPPG	NBEFPPG	PRC_SGCPM	NBPPPM	NBEFPPPM	STRENGTH	DISPERSION
PRC_IND	1	0.01	0.32	0.30	-0.06	0.23	0.04	-0.15	-0.12
NBTOTMG		1	0.004	-0.11	-0.31	0.11	-0.10	0.18	0.34
NBPPG			1	0.89	-0.05	0.47	0.65	-0.31	-0.56
NBEFPPG				1	0.04	0.38	0.69	-0.29	-0.54
PRC_SGCPM					1	-0.15	0.18	-0.12	-0.11
NBPPPM						1	0.37	-0.11	-0.11
NBEFPPPM							1	-0.41	-0.58
STRENGTH								1	0.86
DISPERSION									1

3. Econometric estimations

3.1. The model

Given our different hypotheses and the fact that our collected data represent repeated observations over time, a panel data model is therefore particularly suited to our objective of studying the dynamics of the political structure and its effects on public indebtedness.

For our empirical study, the estimates are made using weighted ordinary least squares (OLS) with period weights. This estimation method takes into account not only the characteristics of the sample but also the weighting used (a weighting based on the number of countries or a weighting based on the number of periods). The choice of this method was based on the Schwarz criterion. Since in our sample the number of years (17) is greater than the number of countries (13), the choice is made between the "OLS" model and the "Period Fixed Effect" model; the model with the weakest Schwarz criterion is adopted. In our case, the "OLS" model has been adopted. As for the weighting option, it is the "Period weights" option that must be selected. We should also note that this method is the one used by several authors carrying out studies quite close to ours; these include Roubini and Sachs (1989), Borrelli and Royed (1995), De Haan et al. (1999), Volkerink and De Haan (2001) and Huber et al. (2003).

The general estimated equation is as follows:

$$\begin{aligned} \Delta DPC = & a_0 + a_1 \Delta REV + a_2 \Delta SPD + a_3 \Delta CI + a_4 \Delta INF + a_5 \Delta GDP + a_6 \Delta UER + \\ & a_7 PRC_IND_{t-1} + a_8 NBTOTMG_{t-1} + a_9 NBPPG_{t-1} + a_{10} NBEFPPG_{t-1} + \\ & a_{11} PRC_SGCPM_{t-1} + a_{12} NBPPPM_{t-1} + a_{13} NBEFPPPM_{t-1} + \varepsilon_t \end{aligned}$$

Based on the argument of Sutter (2003) and Huber et al. (2003) that the share of seats of a party is not a good measure of its power, we have opted for an alternative specification in which we take into account the strength of the coalition government and its dispersion index. In this alternative specification, we replace NBEFPPM by STRENGTH and NBEFPPG by DISPERSION.

$$\begin{aligned} \Delta DPC = & a_0 + a_1 \Delta REV + a_2 \Delta SPD + a_3 \Delta CI + a_4 \Delta INF + a_5 \Delta GDP + a_6 \Delta UER + \\ & a_7 PRC_IND_{t-1} + a_8 NBTOTMG_{t-1} + a_9 NBPPG_{t-1} + a_{10} DISPERSION_{t-1} + \\ & a_{11} PRC_SGCPM_{t-1} + a_{12} NBPPPM_{t-1} + a_{13} STRENGTH_{t-1} + \varepsilon_t \end{aligned}$$

3.2. Estimation results

The results of our estimates (1) to (13) are summarized in Table 5. The numbers, noted in the first row of each independent variable, are the estimated coefficients, and those reported in parentheses in the second row are the standard errors. It should also be added that significance tests are performed with a 10%, 5% and 1% risk of error.

The results of these estimates allow us to make a few observations. With respect to macroeconomic and fiscal variables, only changes in central government spending and changes in the unemployment rate are significant in all estimates with positive coefficients. This means that these two variables are positively correlated with the variation in central public debt. An increase in the unemployment rate and/or public spending will lead to an increase in debt. On the other hand, all other fiscal and macroeconomic variables are not significant. As for the political variables, three of them are significant both when introduced individually or with the set of variables. These variables are: PRC_IND, NBTOTMG and NBEFPPPM. According to the signs of the coefficients, there is, on the one hand, a positive correlation between the percentage of self-employed in government and the central public debt, and on the other hand, a negative correlation between the total number of government members and the central public debt. The first correlation could be explained as follows: a period of economic crisis characterized by an increase in public indebtedness pushes heads of government to call on more independents and technocrats to calm social tensions and give more confidence to the markets. For the second correlation, the argument of the economic situation also prevails. Indeed, a deteriorating economic context would prompt the president or prime minister to reduce the size of governments. With respect to the third variable, the picture is different. Indeed, having a negative coefficient, the effective number of political parties in parliament is negatively related to the variation in the central public debt.

Table 5. Estimation results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-0.03 (0.28)	-0.17 (0.27)	1.42* (0.77)	0.23 (0.41)	0.11 (0.42)	-0.61 (0.83)	0.37 (0.58)	1.88*** (0.51)	3.06*** (1.16)
Δ REV	0.12 (0.28)	0.17 (0.27)	0.14 (0.28)	0.11 (0.29)	0.11 (0.29)	0.12 (0.28)	0.11 (0.29)	0.05 (0.27)	0.19 (0.23)
Δ SPD	0.55*** (0.19)	0.57*** (0.19)	0.57*** (0.19)	0.55*** (0.19)	0.55*** (0.19)	0.54*** (0.20)	0.55*** (0.19)	0.52*** (0.17)	0.51*** (0.16)
Δ CI	1.58 (1.10)	1.71 (1.06)	1.42 (1.10)	1.53 (1.11)	1.56 (1.11)	1.51 (1.11)	1.52 (1.12)	1.41 (1.07)	1.38 (0.98)
Δ INFL	-0.14 (0.19)	-0.14 (0.18)	-0.12 (0.19)	-0.14 (0.19)	-0.14 (0.19)	-0.13 (0.19)	-0.14 (0.19)	-0.11 (0.18)	-0.08 (0.18)
Δ GDP	0.01 (0.11)	0.04 (0.11)	0.01 (0.11)	0.006 (0.11)	0.01 (0.11)	0.02 (0.11)	0.01 (0.11)	0.009 (0.11)	0.04 (0.09)
Δ UER	1.49*** (0.33)	1.54*** (0.33)	1.50*** (0.33)	1.47*** (0.33)	1.48*** (0.33)	1.53*** (0.34)	1.47*** (0.34)	1.51*** (0.31)	1.67*** (0.31)
PRC_IND _{t-1}		5.62** (2.56)							6.36*** (1.18)
NBTOTMG _{t-1}			-0.07** (0.039)						-0.09 (0.04)
NBPPG _{t-1}				-0.11 (0.13)					-0.35 (0.18)
NBEFPPG _{t-1}					-0.07 (0.16)				0.76*** (0.21)
PRC_SGCPM _{t-1}						0.97 (1.32)			1.22 (1.04)
NBPPPM _{t-1}							-0.05 (0.07)		0.006 (0.06)
NBEFPPPM _{t-1}								-0.52*** (0.12)	-0.82*** (0.17)
STRENGTH									
DISPERSION									
Adjusted R ²	0.25	0.26	0.25	0.25	0.25	0.24	0.25	0.29	0.35

Nb. observations	221	221	221	221	221	221	221	221	221
*significant at the 10% level; **significant at the 5% level; ***significant at the 1% level; Standard errors in parentheses									

Table 5 (continued)

	(10)	(11)	(12)	(13)
Constant	-0.11	-0.03	-0.29	-0.11
	(0.85)	(0.32)	(1.32)	(2.73)
Δ REV	0.13	0.13	0.13	0.20
	(0.24)	(0.24)	(0.24)	(0.23)
Δ SPD	0.55***	0.56***	0.56***	0.63***
	(0.18)	(0.18)	(0.18)	(0.18)
Δ CI	1.56**	1.55**	1.55**	1.30**
	(0.74)	(0.74)	(0.74)	(0.74)
Δ INFL	-0.14	-0.14	-0.14	-0.07
	(0.18)	(0.18)	(0.18)	(0.18)
Δ GDP	0.02	0.02	0.02	0.01
	(0.11)	(0.11)	(0.11)	(0.11)
Δ UER	1.47***	1.48***	1.47***	1.46***
	(0.26)	(0.26)	(0.26)	(0.26)
PRC_IND _{t-1}				8.75***
				(2.52)
NBTOTMG _{t-1}				-0.05
				(0.07)
NBPPG _{t-1}				-0.51*
				(0.26)
NBEFPPG _{t-1}				
PRC_SGCPM _{t-1}				0.08
				(1.43)
NBPPPM _{t-1}				0.006
				(0.09)
NBEFPPPM _{t-1}				
STRENGTH	0.12		0.48	3.99
	(1.19)		(2.32)	(3.14)

DISPERSION		-0.004	-0.42	-4.58
		(1.18)	(2.31)	(4.01)
Adjusted R ²	0.23	0.24	0.23	0.26
Nb. observations	221	221	221	221

Looking at the R² adjusted from regressions (1) to (8) and (10) to (12), we find that it is higher in regression (8) than in the other regressions. This means that the quality of the model is better when the effective number of political parties in parliament is taken into account as an explanatory variable. The negative correlation with this variable means that the dispersion of power in parliament is crucial for the control and reduction of public debt. In other words, an equitable distribution of seats in parliament prevents the predominance of one political party over the others. If parliament is dominated by one party and the government is formed mainly by that party, then the party would freely and voluntarily conduct the affairs of state. Put another way, the lack of checks and balances in parliament provides the dominant party with the opportunity to legislate proposals that benefit its constituents (e.g., an increase in public spending). For example, public debt would tend to grow in countries where parliamentary power is monopolized by a small number of political parties and where parliamentary oversight of public finances is ineffective.

The significance (only in the estimation of the general model) of the effective number of political parties in government (NBEFPPG) allows us to highlight another phenomenon. Indeed, the positive coefficient confirms the hypothesis that the lack of consensus among political parties contributes to public debt. This hypothesis was first tested by Roubini and Sachs (1989a,b). The positive correlation means that the more power is dispersed within the government, the more the central public debt would tend to increase. With divergent interests and different voters, political parties would find it difficult to find common ground on which policies to adopt. Each party will protect, against all odds, the interests of its supporters by rejecting any new policy that could destroy their “purchasing power” if they are from the popular class or curtail their privileges if they are from the wealthy class. As a result, the dispersal of power within government creates conflicts of interest and insoluble coordination problems. Political parties with equivalent power are unlikely to compromise on the mechanisms of fiscal discipline. The premise of equal power for all parties leads to the

nullification of policies rather than their mutual reinforcement. Moreover, when the parties have the same bargaining power, the decision-making process takes longer. This implies additional operating costs and a higher opportunity cost.

The alternative specification we have estimated reveals important insights into the relationship between the variables STRENGTH, DISPERSION, and the level of debt in our sample. The two variables do not have a significant effect on the level of debt for our sample. As far as the variable STRENGTH is concerned, our findings align with those of Huber et al (2003): changes in STRENGTH do not lead to statistically significant changes in the level of debt held by the entities in both our study and that of Huber et al (2003). Concerning the variable DISPERSION, our results diverge from those of Huber et al (2003): DISPERSION does not have any impact on the debt level in our sample. The absence of a significant relationship between DISPERSION and debt level implies that variations in DISPERSION among entities do not lead to any statistically significant changes in their debt levels according to our analysis. These contrasting results regarding the variable DISPERSION raise intriguing questions and warrant further investigation. It is possible that differences in data sources, sample composition, or methodological choices may have contributed to the disparity between our findings and those of Huber et al (2003). As researchers, we acknowledge the significance of these discrepancies and the potential implications for understanding the determinants of debt levels.

4. Comments and concluding remarks

According to our results, the dispersion of power within government explains the growth of public debt. Indeed, a coalition characterized by dispersed power among the parties generates more deficits and more public debt. This problem was raised by Downs (1957) who noted that economic programs are less integrated when there is a coalition government. A coalition can only govern efficiently when all its members agree on the policy to be pursued. The stronger the consensus, the more effective the government action. Certainly, in a democracy, a consensus on objectives is essential for a nation's economic sustainability. Therefore, in order to preserve government cohesion and limit public borrowing, it makes more sense to form a government with a limited number of political parties and to avoid dispersal of power. The best hypothesis is likely to have a government formed by a single political party. Of course, this does not apply to one-party people's democracies, which are often seen as dictatorships. On the parliamentary

side, the situation is different. Public debt is a decreasing function of the dispersion of power within parliament. A parliament with power fairly distributed among the political parties is the best guarantee of effective parliamentary control. In this case, it is easier to form opposition groups within parliament and to prevent the domination of any one party. Thus, the dispersion of power is a key determinant of the effectiveness of parliamentary oversight of public finances. The number of parties is a secondary factor since there may be parliaments with a small number of political parties and dispersed power, or parliaments with a large number of political parties and undispersed power.

The results obtained from our econometric study confirm the following hypotheses. The lack of consensus among the political parties in the governing coalition and the ineffectiveness of parliamentary control are factors explaining the central public debt. In fact, the political governance we studied is closely linked to the country's electoral system. Indeed, the electoral system explains the composition of parliament in terms of the number of political parties and the distribution of seats, which in turn explains the type of government formed. According to the correlation table (Table 4), we find a strong correlation between the number of political parties in parliament and the number of political parties in government. Moreover, the dispersion of power in government is related to the dispersion of power in parliament. Consequently, the political chessboard of each country depends on the electoral system and the distribution of seats in parliament. For example, a parliamentary system with proportional representation generally leads to pluralist parliaments and thus broader government coalitions. On the other hand, a parliamentary system with a majority vote generally results in smaller governments.¹² Based on the work of Persson et al. (2000), the analysis of the political structure and economic policies must take into account the political regime of the country. The characteristics of each political regime influence the nature of executive power. In a parliamentary system, for example, understanding between political parties is likely to the extent that each political party would like to be part of the government coalition. In such a regime, the government derives its power from the parliamentary majority. In other words, the survival of a governing coalition depends closely on the confidence that the parliamentary majority places in it. In contrast, in a presidential system, parliament has less power over the government. He is not able, for example, to dissolve the government at any time during the

¹² For example, Italy and Belgium have adopted proportional representation, which explains the plurality of political parties in their parliament. On average, in Italy, between 1996 and 2012, the number of political parties in parliament and government is 12.64 and 5.64 respectively. In Belgium, for the same period, there is an average of 10.76 parties in parliament and 4.70 parties in government. Conversely, Greece with its majority electoral system has an average of 4.41 political parties in parliament and 1 political party in government.

electoral term. Consequently, the separation of powers is more visible in a presidential system than in a parliamentary system. On the other hand, Persson et al. (2000) have also shown that a presidential regime leads to small governments that opt for less redistribution. On the other hand, a parliamentary system leads to government coalitions which tend to favor redistribution. Thus the electoral system and the political regime are two determining parameters of political governance.

From a sample of thirteen developed countries, this paper has shown that public debt is significantly affected by the dispersion of power in government and parliament. While the dispersion of power is desirable at the level of parliament to ensure effective parliamentary oversight, it is not welcome in government as it fosters a lack of consensus among political parties. This paper has also shown that the strength of a governing coalition and the dispersion of power within this coalition do not have a significant effect on the level of debt for our sample. Our result on the strength of a governing coalition is in line with that of Huber et al (2003), but as for the dispersion of power, our results do not bring a positive news as in Huber et al (2003).

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