

Political fragmentation, Party ideology and Public expenditures

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Abstract

Many papers have investigated the influence of political factors on public decision-making. Recently some papers have examined the impact of political fragmentation on budgetary outcomes at the sub-national level of government. In this paper we propose a theoretical model to explain how political fragmentation of both majority and opposition coalitions might play a role in explaining public expenditure. We test for the existence of such a political fragmentation effect in the case of the French *départements*. We show that political fragmentation of both opposition and majority coalitions has a significant impact on the amount of per capita social expenditure of French *départements*. The less fragmented the right-wing (left-wing) opposition, relative to the left-wing (right-wing) majority, the lower (higher) the social service expenditure per head, ceteris paribus. This empirical evidence supports both the Partisan hypothesis and a refinement of the political fragmentation effect.

JEL-Classification: C35, D70, H40, H72

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1. Introduction

Many papers have investigated the influence of political factors on public spending. Political fragmentation is one of these factors. The intuition relies mostly on the common pool resource hypothesis. A politician belonging to a coalition of n politicians is supposed to defend the interest of its own constituency, for instance expand a particular item of public spending. Since the cost of the expansion is divided among the voters of the n constituencies, a non cooperative politician sets an increase in public spending which is higher than the efficient one. This theory can be traced in Buchanan and Tullock (1962) and Olson (1965). Refinements are found in Weingast and al (1981) and more recently in Velasco (2000). According to this theory, the larger the size of the legislature, the higher the public expenditures. This result sometimes termed the "weak government hypothesis" (Roubini and Sachs, 1989a) or "the law of $1/n$ " (Bradbury and Crain, 2001) is the starting point of many empirical studies. Political fragmentation is measured by the number of parties in a coalition, the number of spending ministers or the number of representatives (see Kuster and Botero, 2008 for a comparison of the different measure of political fragmentation). Most of the studies find a positive correlation between political fragmentation and the level of public expenditures as suggested by the theory (for instance Volkering and de Haan, 2001; Bradbury and Crain, 2001; Padovano and Venturi, 2001; Perotti and Kontopoulos, 2002).

Yet, a different story can be told to illustrate why political fragmentation matters as far as policy outcomes are concerned. The story is based on the team production theory (Alchian and Demsetz, 1972). As discussed by Crain and Tollison (1982), the activity of a political coalition may be seen as a team process in that there is a team production where it is not feasible to allocate rewards as a function of individual productivity of parties¹. In that setting, the production of the coalition, its political bargaining power for instance, has the properties of a public good and the parties of the coalition may have incentives to free-ride and devote

time and resources to other activities. We use this framework in our paper. Moreover we assume that the implemented policy is the result of a Majority - Opposition confrontation in Parliament. Each group compromises according to a *contest success function* (Tullock, 1980 and Skaperdas, 1996). We show that the political influence of a group depends both on the number of seats and on the fragmentation of the groups measured by the Herfindahl index of the percentage of seats of the parties composing the groups. This result is due to strategic interactions among parties of the same group which leads to free-riding: the lower the concentration of the group, the less the participation of parties in the production of the group. We also show that, through the contest, the power of a majority coalition also depends on the fragmentation of the opposition group. These results allow us to propose a measure of a coalition political bargaining power which may be used in econometric studies. Our theoretical approach differs in two points from other studies. First, as far as we know, contests have not yet been used to analyse the provision of public goods. Second, contest success functions have been utilized for modeling conflicts between two or more agents but not between two groups subject to fragmentation.

Following this theoretical approach we test for the existence of a *relative political fragmentation effect* in the case of French local public expenditures. A few empirical papers deal with the effect of political fragmentation on budgetary outcomes at the local government level, for instance Pommerehne (1978) for the Swiss cantons, Poterba (1994) for US States, Borge and Rattsø (2002) for Norwegian municipalities, Rattsø and Tovmo (2002) for Danish municipalities or Ashworth and Heyndel (2005) for Flemish municipalities. Our study is different in that it takes account of not only the majority but also the opposition fragmentation as suggested by our theoretical results. Moreover we couple the political bargaining power with party ideology. There is an abundant literature on the impact of party ideology on government spending (see Boyne, 1996 for a survey) which may be summarized as follows: Parties on the right/left decrease/increase the size of the public sector when they are in power.

We find empirical evidence that both majority and opposition fragmentation has a significant impact on the amount of per head social expenditure of the French *départements*. The less fragmented the right-wing (left-wing) opposition, relative to the left-wing (right-wing) majority, the lower (higher) the social expenditure per head, *ceteris paribus*. This empirical evidence supports both the Left-wing/Right-wing politics and a particular refinement of the political fragmentation hypothesis. Moreover it gives an empirical validity to our political bargaining power index.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework. Section 3 is dedicated to the presentation of the econometric analysis. Section 4 provides the estimation results. Section 5 concludes.

2. Theoretical model

Consider a parliament where two political groups, labelled Group *A* and Group *B*, compete for imposing their view on the policy to be implemented. The influence a group has on public decision making depends on the number of its members actively participating in the debate. We denote s^A and s^B the number of seats respectively held by Group *A* and Group *B*. Let $a \leq s^A$ and $b \leq s^B$ represent the number of Group *A*'s (respectively *B*'s) members who are taking an active part in the debate. The influence exerted by Group *A* and Group *B* on the decision making is respectively given by

$$\pi^A(a, b) = \frac{a}{a + b} \quad \text{and} \quad \pi^B(a, b) = 1 - \pi^A(a, b). \quad (1)$$

$\pi^A(a, b)$ and $\pi^B(a, b)$ are *contest success functions* as in Tullock (1980) and Skaperdas (1996). They are used to translate both groups' participation to the debate into how they influence the public policy. They may also be seen as a measure of the bargaining power of competing political groups.

Each group is respectively composed of n^A and n^B parties. The number of seats held by Party p in Group A, $p = 1 \dots n^A$, is denoted s_p^A . Similarly, the number of seats held by Party p in Group B, $p = 1 \dots n^B$, is denoted s_p^B . Let $a_p \leq s_p^A$ (respectively $b_p \leq s_p^B$) account for the number of members of Party p in Group A (resp. in Group B) that actively participate in the debate. We have $\sum_{p=1}^{n^A} a_p = a$ and $\sum_{p=1}^{n^B} b_p = b$. We assume that the activity of political groups is a team process. The political bargaining power of a group is the result of the participation of each member of the group in the debates in parliament. The parties inside the same group are supposed to behave non-cooperatively. Party p in Group A chooses its participation a_p so as to maximize its net welfare,

$$U_p^A(a_p) = \frac{a}{a+b} - \left(\frac{a_p}{s_p^A} \right)^\lambda, \quad p = 1 \dots n^A, \quad (2)$$

with $\lambda > 0$ and where $\left(\frac{a_p}{s_p^A} \right)^\lambda$ represents the cost of Party p 's participation in the debate. In other words, Party p 's utility is an increasing function of Group A's influence $\pi^A(a, b)$ but a decreasing function of $\frac{a_p}{s_p^A}$, which denotes the share of seats really occupied by Party p , and measures Party p 's effort in Group A's production.

Assume that $\lambda \geq 1$, which ensures that the second-order conditions are met. The participation level of Party p in Group A must satisfy the following first-order condition:

$$\frac{\partial U_p^A}{\partial a_p} = \frac{b}{(a+b)^2} - \frac{\lambda}{s_p^A} \left(\frac{a_p}{s_p^A} \right)^{\lambda-1} = 0, \quad p = 1 \dots n^A. \quad (3)$$

Rewriting the first-order condition implies $a_p = (s_p^A)^{\frac{\lambda}{\lambda-1}} \left(\frac{b}{\lambda(a+b)^2} \right)^{\frac{1}{\lambda-1}}$, $p = 1 \dots n^A$. Since

$a = \sum_{p=1}^{n^A} a_p$, we have

$$a = \sum_{p=1}^{n^A} (s_p^A)^{\frac{\lambda}{\lambda-1}} \left(\frac{b}{\lambda(a+b)^2} \right)^{\frac{1}{\lambda-1}}, \quad (4)$$

which implicitly defines the optimal response $a = a(b)$ of Group A to any strategy b chosen by Group B.

By symmetry, if the utility function of Party p in Group B is given by $U_p^B(b_p) = \frac{b}{a+b} - \left(\frac{b_p}{s_p^B} \right)^\lambda$, we find that

$$b = \sum_{p=1}^{n^B} (s_p^B)^{\frac{\lambda}{\lambda-1}} \left(\frac{a}{\lambda(a+b)^2} \right)^{\frac{1}{\lambda-1}}, \quad (5)$$

which implicitly defines the reaction function of Group B, that is, $b = b(a)$. It follows from Equations 4 and 5 that

$$\frac{a}{b} = \left(\frac{X^A}{X^B} \right)^{\frac{\lambda-1}{\lambda}}, \quad (6)$$

with $X^A = \sum_{p=1}^{n^A} (s_p^A)^{\frac{\lambda}{\lambda-1}}$ and $X^B = \sum_{p=1}^{n^B} (s_p^B)^{\frac{\lambda}{\lambda-1}}$.

The functions X^A and X^B measure both the size of Groups A and B and the way they are structured. Using Equation 6 with Equations 4 and 5 yields the Nash equilibrium participation levels of Group A and Group B :

$$a^* = \left(X^A \right)^{\frac{\lambda-1}{\lambda}} \left(\frac{(X^A)^{\frac{\lambda-1}{\lambda}} (X^B)^{\frac{\lambda-1}{\lambda}}}{\lambda \left((X^A)^{\frac{\lambda-1}{\lambda}} + (X^B)^{\frac{\lambda-1}{\lambda}} \right)^2} \right)^{\frac{1}{\lambda}} \quad (7)$$

$$b^* = (X^B)^{\frac{\lambda-1}{\lambda}} \left(\frac{(X^A)^{\frac{\lambda-1}{\lambda}} (X^B)^{\frac{\lambda-1}{\lambda}}}{\lambda \left((X^A)^{\frac{\lambda-1}{\lambda}} + (X^B)^{\frac{\lambda-1}{\lambda}} \right)^2} \right)^{\frac{1}{\lambda}} \quad (8)$$

By using Equation 6 with Equation 1, we directly find the equilibrium values of the contest success functions:

$$\pi^A(a^*, b^*) = \frac{1}{1 + \left(\frac{X^B}{X^A} \right)^{\frac{\lambda-1}{\lambda}}} \quad (9)$$

and

$$\pi^B(a^*, b^*) = \frac{1}{1 + \left(\frac{X^A}{X^B} \right)^{\frac{\lambda-1}{\lambda}}}. \quad (10)$$

Notice that the functions X^K , $K = \{A, B\}$, may be re-written as: $X^K = (s^K)^{\frac{\lambda}{\lambda-1}} \sum_{p=1}^{n^K} (\alpha_p^K)^{\frac{\lambda}{\lambda-1}}$, where $\alpha_p^K = \frac{s_p^K}{s^K}$ is the share of seats held by Party p in Group K . If $\lambda = 2$, then $X^K = (s^K)^2 (HI^K)$ where $HI^K = \sum_{p=1}^{n^K} (\alpha_p^K)^2$ denotes the Herfindhal index of Group K . This index is often used in the empirical Public choice literature to measure the power of governments. The higher HI^K , the more concentrated and then the more powerful Group K is. However the index we propose to measure the political bargaining power of a group is different from that which is generally used in the literature. It does not take into account the absolute but the relative concentration and the relative size of a group. This index denoted I^A for Group A is derived from Equation 9 and may be written as:

$$I^A = \frac{s^A}{s^B} \sqrt{\frac{HI^A}{HI^B}}. \quad (11)$$

The higher I^A the more powerful Group A is ($\frac{\partial \pi^A(a^*, b^*)}{\partial I^A} > 0$). It is easy to show that the influence of a group increases with its concentration and its size and decreases with the other group's concentration and size ($\frac{\partial I^A}{\partial s^A} > 0$, $\frac{\partial I^A}{\partial s^B} < 0$, $\frac{\partial I^A}{\partial HI^A} > 0$, and $\frac{\partial I^A}{\partial HI^B} < 0$). The Herfindahl index HI^K ranges from 0 (if the number of parties in Group K tends toward infinity) to 1 (if there is only one party in the group). If there is an equal sharing of seats among the different parties of Group K , then $HI^K = \frac{1}{n^K}$. Consequently, I^A ranges from 0 (if there is an infinite number of parties in A and one party in B) to $+\infty$ (if there is only one party in A and an infinite number of parties in B).

We summarize these findings in the following proposition:

Proposition 1. *In a non-cooperative Nash game in which two political groups A and B try to influence the public decision making according to a Tullock-Skaperdas contest success function, the relative political bargaining power of Group A may be measured as: $I^A = \frac{s^A}{s^B} \sqrt{\frac{HI^A}{HI^B}}$.*

3. Data and specification

According to the previous discussion, we specify a per capita public expenditure equation as follows:

$$\ln(e) = w'\Phi + \Omega_1(LEFT)(I^L) + \Omega_2(1 - LEFT)(I^R) + \varepsilon, \quad (12)$$

where w' is a vector of control variables, Φ a vector of parameters to be estimated, $LEFT$ a dummy variable that takes the value of 1 when the majority is on the left and 0 for a right wing majority, and I^L (respectively I^R) is the political bargaining power of the left wing (respectively right wing) group as defined by equation 11 above, Ω_1 and Ω_2 are two parameters to be estimated. As suggested by the party ideology hypothesis Ω_1 should be positive while Ω_2 should be negative.

The study uses balanced panel data consisting of the French *départements* for years 1992 to 1999. By decreasing size, the three levels of local government in France are the *régions* (approx. states or provinces), the *départements* (approx. counties) and the *communes* (approx. townships or municipalities). France is divided in 96 metropolitan *départements* regrouped in 22 regions and 4 overseas *départements*, the DOM (Guadeloupe, Guyane, Martinique and Réunion). They can cover a single municipality (Paris) up to several hundreds, the average being around 360. They were created on geographical basis at the time of the Revolution. Most of them have a surface area comprised between 4,000 and 8,000 km² and a population of 250,000 to 1,000,000 inhabitants. Each *département* is administered by a General Council. For each constituency a General Councillor is directly elected for a term of six years. A constituency is a grouping of municipalities known as a *canton*. The elections (referred to as *Elections Cantonales*) are held every three years. Consequently, only half the councillors are renewed at each election. Since 1982, the General Council is headed by a president elected by the councillors for a term of six years. The latter prepares the council's debates and implements its decisions, heads the *département's* staff and services, exercises certain police powers in the areas of conservation and *département* highways and represents the *département* at the legal level.

If there is a certain uniformity between *départements*, some exceptions deserve mentioning. Since 1995, Paris and the two Corsican *départements* do no longer have any business tax. Moreover, the four overseas *départements*, Guadeloupe, Guyane, Martinique and Réunion, have various autonomy degrees. Lastly, three of the French *départements* (Bas-Rhin, Haut-Rhin and Moselle) due to their history have institutional specificities which make them somewhat different from the others. In order not to bias the estimation results, these *départements* have been excluded from the sample, leaving us with 90 *départements*.

The variables used in the econometric analysis are successively presented below: First the dependent variable, second the vector of control variables w' , third the party ideology

variable and fourth the political bargaining variables. The description and the summary statistics of these variables are given respectively in Tables 1 and 2.

3.1. *The Dependent Variable e*

The social expenditure per head is the dependent variable. We have chosen this variable because it fits well in our theoretical framework. First, social assistance represents the main element of *département's* operating expenditures (61% of total operating expenditures in 1999). It is partly defined by national law and partly by regulations voted by the General Council. The social expenditure is composed of protection of the mother and infants (prevention, protection, aids to family, etc.), of social assistance for handicapped persons (subsidies to homes, direct payments, modifications of their house to provide them better access, etc.), for pensioners and elderly people (direct payments and subsidies to homes) and for unemployed persons (health protection, etc.). Second, social assistance is a redistribution policy which lends itself well to testing the party ideology hypothesis that left-wing governments spend more than right-wing governments. A quick glance at figure 1 confirms this intuition. It represents the per head social expenditures of the French *Départements* (90 *Départements* over 8 years). The average per head expenditure amounts to 1309 francs for right-wing *Départements*, while it reaches 1542 francs for left-wing *Départements*.

3.2. *The Vector of control variables w'*

Vector w' is used to control for different aspects of the public decision making process. The usual median voter model variables are part of this vector. Variable $b_{i,t}^m/b_{i,t}$ represents the median voter's tax share. Since the individual with the median preference parameter is not known, the base of the median voter b_t^m is not available. Then b_t^m/b_t is replaced with the household tax share, which is defined as the share of household taxes (tax on housing and

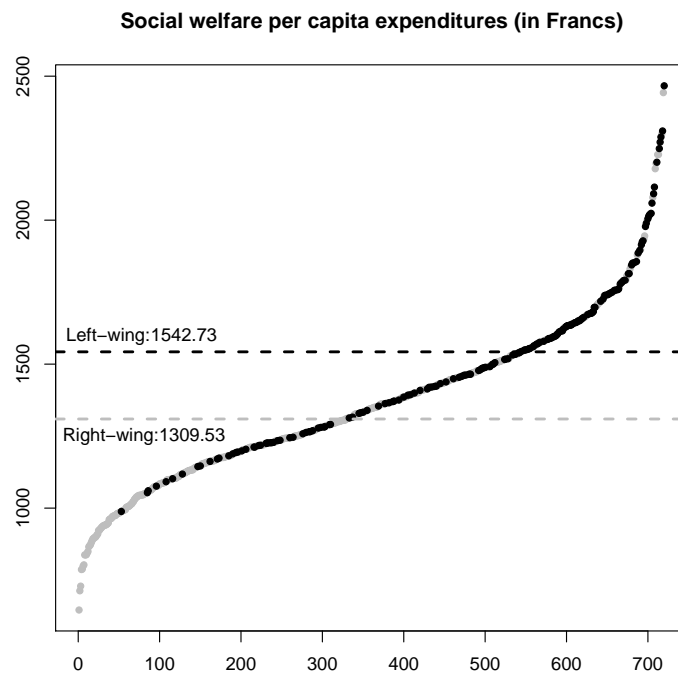


Figure 1.

property taxes) in the total taxes of the *département* (tax on housing, property taxes and local business tax). This is a standard assumption as regards the median voter model (see for instance Turnbull and Mitias, 1999). According to Bergstrom and Goodman (1973), the provision of public goods is negatively related to the tax share of the median voter. Variable $y_{i,t}^m$ represents the median voter's income. Since the individual with the median preference parameter is not known, the income of the median voter $y_{i,t}^m$ is not available. In addition, data on income distributions are not known. Consequently $y_{i,t}^m$ is simply replaced with the average household income. It is calculated by dividing the total income of the *département* by population. Variable $s_{i,t}$ stands for the grants received by the *département* per inhabitant. Since they are lump-sum, we should rather expect a positive impact of $s_{i,t}$ on the dependent variables. Variable $N_{i,t}$ represents the local population. The empirical literature usually views population as having a significant impact on *per capita* spendings (see Breunig and Rocaboy, 2008).

To these median voter variables we add three other control variables: the share of population older than 65 (OLD), the population density of the *départements* (DENS) and a trend (TREND). Variable OLD takes account of the demand for social services and variable DENS controls for the cost of providing these services.

3.3. Party Ideology Variables

Variable $LEFT_{i,t}$ represents the ideology of the majority. It is a dummy equal to 1 if more than 50% of General Councillors are on the left and zero else. Left-wing governments should advocate a general increase in public expenditure compared to right-wing governments. This applies particularly to expenditures in the areas of social assistance. This is the so-called Partisan hypothesis.

Table 3 provides a description of the 18 political parties present in the General Councils over the period 1992-1999. The partition left-wing/right-wing presented in this table is the

Table 1. Description of the Variables.^a

Variable	Content
$SOCIAL_{i,t}$	Per capita social assistance expenditures.
$b_{i,t}^m/b_{i,t}$	Per capita median voter's tax share. Since the individual with the median preference parameter is not known, the tax base of the median voter b_i^m is not available. b_i^m/b_i then is replaced with the household tax share, which is defined as the household share (tax on housing and property taxes) of <i>département</i> taxes (property taxes, local business tax, tax on housing) ^b
$y_{i,t}^m$	Median voter's income. Since the individual with the median preference parameter is not known, the income of the median voter y_i^m is not available. It is replaced with the mean household taxable income ^b
$s_{i,t}$	Grants received by the <i>département</i> (mainly from the central government) per inhabitant.
$N_{i,t}$	Local population.
$OLD_{i,t}$	Share of population being more than 65.
$DENS_{i,t}$	Population density of the <i>département</i> .
$TREND_t$	Trend. It takes the value 0 for year year 1992, 1 for year 1993, ...
$LEFT_{i,t}$	Ideology of the majority coalition. It is a dummy equal to one if the majority coalition in the <i>département</i> council is on the left and zero if on the right.
$I_{i,t}^R = \frac{s^R}{s^L} \sqrt{\frac{HI^R}{HI^L}}$	Right-wing group bargaining power : s^R : Number of seats held by the right-wing group s^L : Number of seats held by the Left-wing group $HI^R = \sum_{p=1}^{n^R} (\alpha_p^R)^2$: Herfindahl index of the Right-wing group where n^R is the number of right-wing parties and α_p^R is the share of seats of Party p in the Right wing group.
$I_{i,t}^L = \frac{s^L}{s^R} \sqrt{\frac{HI^L}{HI^R}}$	Left-wing group bargaining power.

^a Indexes i and t respectively stand for *département* i and year t .

^b This is a standard assumption as regards the median voter model (see for instance Turnbull and Mitias, 1999).

Table 2. Summary Statistics.^a

Variables	Mean	Min	Max	SD
$SOCIAL_{i,t}$	1370	646	2467	283
$b_{i,t}^m/b_{i,t}$	0.521	0.067	0.884	0.076
$y_{i,t}^m$	42353	29460	80474	6332
$s_{i,t}$	914	383	2991	308
$N_{i,t}$	585984	72390	2555471	435502
OLD	0.2219	0.1231	0.3362	0.0430
$DENS$	320	14	8113	1140
$LEFT_{i,t}$	0.261	0	1	0.440
$I_{i,t}^A$	2.722	0.5689	21	2.287

^a Number of observations: 720. $SOCIAL_{i,t}$, $s_{i,t}$ and $y_{i,t}^m$ are in Francs.

one used to construct $LEFT_{i,t}$. The main voting blocs are the *Parti Communiste Français* also referred to as PC (6%-7% of whole seats), the *Parti Socialiste* referred to as PS (22%-30%), the *Union pour la Démocratie Française* or UDF (18%-25%) and the *Rassemblement Pour la République* or RPR (17%-22%). The PC is a far left-wing party founded in 1920 by those in the SFIO (French section of the Workers' International) who supported in 1917 the Bolshevik Revolution and opposed the First World War. The SFIO was a socialist political party founded in 1905. It was replaced in 1969 by the PS, which is now the main opposition party in France. In addition, the UDF is a French right-centrist party. It was established as a union among several smaller parties: the *Parti radical (valoisien)*, the *Parti républicain* and the *Centre des démocrates sociaux*. It was founded in 1978 as an electoral organization to support President Valéry Giscard d'Estaing during the presidential election of 1981. Lastly, the RPR was founded by Jacques Chirac in 1976 as the heir of the UDR, the successor to Charles de Gaulle's former party. It was replaced in 2002 by the UMP (Union for a Popular Movement).

Before the nineties, the PCF and the PS usually composed the left-wing coalition in General Councils while the UDF and the RPR formed the right-wing coalition. The appearance of new political tendencies like The Greens, the MDC, the MDR, the GE, the MPF has nonetheless created divisions within both the left-wing and the right-wing, making these coalitions fragile. The pluralism has also been reinforced by the emergence of parties, like the MEI or the ADD, that deals with specific subject. In addition, more than 15% of the whole seats are held by independent right-wing candidates who do not belong to the parties of Table 3, which accentuates even more the fragmentation of the *départements'* political landscape. Likewise, more than 2% of seats are held by left-wing independent candidates. The presence of the right-wing in General Councils is consequently more important that we could think with Table 3. The right-wing actually held in 1992 more than 63% of seats in the 90 considered *départements*, 64% in 1994 and 52% in 1998. The summary statistics of

Table 3. Political Parties at the département Level.

Name	Acronym	English name	Political ideology	Remarks	1992 ^a	1994 ^b	1998 ^a
<i>Left-wing political parties</i>							
Convention pour une Alternative Progressiste	CAP	Convention for a Progressive Alternative	Far left-wing, Environmentalism	Founded in 1994 mainly by former members of the PCF, the ADS, the PS and The Greens. Dissolved in 1998	0%	0%	0.38%
Parti Communiste Français	PCF	French Communist Party	Far left-wing, Left-wing, Communism	Major voting block. Founded in 1920	6.90%	6.47%	7.31%
Alternative, Démocratie, Socialisme	ADS	Alternative, Democracy, Socialism	Left, Far Left-Wing, Alliances on the left, Communism	Founded in 1994 mainly by past members of the PCF	0.33%	0.36%	0%
Mouvement des Citoyens, Mouvement Républicain et Citoyen	MDC, MRC	Citizens' Movement, Republican and Citizen Movement	Left-wing, Social democracy, Democratic socialism	Founded by Jean-Pierre Chevènement in 1993	0%	0.25%	0.49%
Association pour la Démocratie et le Développement	ADD	Association for Democracy and Development	Left-wing, Defense of democracy and human rights, Humanitarian assistance	Founded by Hassan Mokbel in 1991, it has merged as a result of student movements	0.03%	0.05%	0.05%
Génération Écologie	GE	Ecology Generation	Left-Wing, Cross-party alliances of green-minded politicians	Founded by Brice Lalonde in 1990	0.19%	0.16%	0.03%
Majorité plurielle		Plural Majority	Alliances between the MRC, the PS, the PCF, the PRG, and The Greens	Founded in 1997	0.19%	0%	0%
Les Verts		The Greens	Left-wing, Environmentalism	Founded in 1982	0.02%	0.05%	0.14%
Parti socialiste	PS	Socialist Party	Left-wing, Center left, Social democracy, Democratic socialism	Major voting block. Replaced the SFIO in 1969	23.89%	22.44%	30.28%
Parti radical de gauche, Mouvement des Radicaux de Gauche	PRG, MRG	Left Radical Party, Left Radical Movement	Center left, Social democracy, Democratic socialism	Founded in 1971. Heir of the <i>Parti républicain, radical et radical-socialiste</i>	1.83%	1.59%	1.70%
Mouvement Écologiste Indépendant	MEI	Independent Ecological Movement	Center, Center Left, Environmentalism	Founded by Antoine Waechter in 1994	0%	0%	0.03%
<i>Right-wing political parties</i>							
Mouvement Des Reformateurs	MDR	Reformists Movement	Center, Center right, Ambiguous	Founded by Jean-Pierre Soisson in 1992	0.27%	0.08%	0%
Union Démocratique Internationale	UDI	International Democrat Union	Center, Center right, Conservatism, Christian democracy, Liberalism	International organization founded in 1983	0%	0.03%	0%
Union pour la Démocratie Française	UDF	Union for French Democracy	Center right, Christian democracy minority factions, Social liberalism	Major voting block. Founded by Valéry Giscard d'Estaing in 1978	25.45%	25.16%	18.91%
Rassemblement pour la République	RPR	Rally for the Republic	Right-wing, Conservatism, Gaullism	Major voting block. Founded by Jacques Chirac in 1976	22.11%	22.39%	17.99%
Centre National des Indépendants et Paysans	CNI, CNIP	National Center of Independents and Peasants	Alliances mainly between the UDF, the RPR, the MPF, and the FN	Founded by Roger Duchetin in 1948 as the National Centre of Independents	0.57%	0.33%	0.11%
Mouvement pour la France	MPF	Movement for France	Right-wing, Far right-wing	Founded by Philippe de Villiers in 1994	0%	0%	0.14%
Front National	FN	National Front	Far right-wing, Nationalism	Founded by Jean-Marie Le Pen in 1972	0.08%	0.11%	0.19%

^a Share of seats held in the 90 considered *départements* for the 1992, 1994 and 1998 cantonal elections.

Table 2 are even more explicit as regards the political ideology of the French *départements*. According to the statistics of $LEFT_{i,t}$, only 26.01% of the 90 *départements* were actually on the left over the period 1992-1999. The difference between these numbers may actually be explained by the fact that in left-wing governments, most of the seats are held by left-wing politicians while in right-wing governments the opposition is always well present. In other words, the left-wing electorate is less geographically dispersed than the right-wing electorate.

3.4. Political Bargaining Power Variables

This variable is the key variable of the econometric analysis. It measures the relative political strength of a coalition. Several measures have been put forward in similar studies. The Roubini and Sachs' Index is a discrete variable which takes value 0 to 3 depending on the number of parties in the majority (Roubini and Sachs, 1989a; 1989b). This index has been seriously criticized by Edin and Ohlsson (1991). They argue that this variable actually captures the effects of minority government rather than the number of parties. Instead of dummy variables, some studies simply use the number of parties or the number of decision-makers (Kontopoulos and Perotti, 1999; de Haan *et al.*, 1999). Herfindahl Index has also been proposed to measure the fragmentation of a council (Borge, 1995; Falch and Rattsø, 1999 ; Tovmo and Falch, 2002). Another political fragmentation measure is that of Banzhaf (1965). The Banzhaf index is computed such that it takes into account, for each party, the number of winning coalitions it can participate in but which are not winning if it does not participate (see for instance Pommerehne, 1978 and Huber *et al.*, 2003).

In our econometric specifications, contrary to previous empirical studies, we use a political bargaining power index based on the fragmentation of both majority and opposition groups (exception is Padovano and Venturi, 2001). As suggested by equation (11), our index is measured by $I^A = \frac{s^A}{s^B} \sqrt{\frac{HI^A}{HI^B}}$, where A is the ideology of the majority coalition ($A = L$ for Left-wing coalition and R for Right-wing coalition), B is the ideology of the opposition group

and HI^A (respectively HI^B) is the Herfindahl index of majority A (repectively opposition B): $HI^K = \sum_{p=1}^{P^K} (SHARE_p^K)^2$ where $SHARE_p^K$ is the share of representatives of party p of Group K in the *département* council ($K = A, B$).

To sum up, the empirical model tested in this paper is as follows:

$$\begin{aligned} \ln SOCIAL_{i,t} = & \Phi_0 + \Phi_1 \ln(b_{i,t}^m/b_{i,t}) + \Phi_2 \ln(y_{i,t}^m) + \Phi_3 \ln(s_{i,t}) + \Phi_4 \ln(N_{i,t}) + \\ & \Phi_5(OLD_{i,t}) + \Phi_6 \ln(DENS_{i,t}) + \Phi_7 \ln(TREND_t) + \\ & \Omega_1(LEFT_{i,t})(I_{i,t}^L) + \Omega_2(1 - LEFT_{i,t})(I_{i,t}^R) + u_{i,t}. \end{aligned} \quad (13)$$

where i stands for *département* i and t for year t . In short, social expenditures per head are defined as a function of the median voter's characteristics, and of other variables that allow to account for deviations from median voter's preferences due to ideology and political bargaining.

4. Results

Equation 13 is estimated by using Pooled-OLS. The estimation results are given in the first column of Table 4, labelled Specification 1. As we can see, the adjusted R^2 is relatively high reaching 60%. The estimates concerning tax share, income, grants and population are significant and consistent with what is generally found in the literature. The tax share coefficient is significant at the 5% level and equal to -0.086. The income coefficient is highly significant, positive and equal to 0.453. The grant coefficient is significant and appears with the expected positive sign. Its value accounts for 0.446. The population coefficient is positive, significant and equal to 0.029, suggesting that the magnitude of the congestion effects is relatively important. The coefficients of variables Density and Trend are positive and significant.

Both political bargaining power variables are significant determinants of per head social

expenditures and their sign is consistent with the theory. The coefficient of variable I^L is positive showing that the stronger a left-wing group, the higher per head social expenditures. *A contrario*, the coefficient of variable I^R is negative suggesting that the more powerful a right-wing coalition, the lower per head social expenditures. Columns labelled Specification 2 and Specification 3 display the results we obtain from estimating Equation 13 with majority groups sharing the same ideology. There are 188 left-wing *départements* and 532 right-wing *départements*. There are no significant changes compared with Specification 1. The coefficients of variables I^L and I^R are still significant with the expected signs.

As suggested by Equation 11, the political bargaining power of a majority, I^A , depends on its electoral margin and its relative fragmentation. To disentangle these two effects we have replaced I^A with the electoral margin of the majority measured by $RS^A = S^A/S^B$, the Herfindhal index of the majority HI^A and the Herfindhal index of the opposition HI^B . The results are given in column labelled Specification 4 for left-wing majority groups and in column labelled specification 5 for right-wing majorities. For leftist majorities, the effects which determine their political bargaining power are all significant and in the right direction. The coefficients of variables RS^A , HI^A and HI^B are respectively equal to 0.044, 0.142 and -0.274. It means that a high electoral margin and a low fragmentation of leftist majorities are two significant factors which raise per head social expenditures, while a high concentration of the right-wing opposition reduces social expenditures per capita. For rightist majorities, the electoral margin and the concentration of the group have negative effects on per capita social expenditures whereas the fragmentation of the left-wing opposition has no significant effect.

These different results may be illustrated by Figures 2, 3, 4 and 5. They depict respectively the political bargaining power, the electoral margin and the Herfindahl index of the majority, and the Herfindahl index of the opposition for the 90 *départements* over the 8 years of our study. As depicted by figure 2, the average political bargaining power of the left-wing and right-wing majorities, I^A , are pretty close, reaching respectively 2.99 and

2.63 for leftist and rightist *départements*. However the electoral margin of the right-wing *départements* is much higher than that of the left-wing *départements*, respectively 21.7% and 15.1% (see figure 3) and the left-wing groups are more concentrated than the right-wing groups, whatever their status, majority or opposition (see figure 4 and 5). It looks like there may be a kind of substitutability between electoral margin and fragmentation. The larger the electoral margin of the majority, the more fragmented it is. Moreover, as regards the impact of the opposition fragmentation, it seems that it might play a role only in the case of a relatively small electoral margin of the majority. Having a large electoral margin on average, the right-wing *départements* have the possibility to be more fragmented and the concentration of the left-wing opposition does not matter (the coefficient of the Herfindahl index of the leftist opposition is not significant in our estimations).

5. Conclusion

In this paper we couple a contest success function with a team production model to explain how political fragmentation of two opposite groups in a council may impact the decision-making process. We show that the influence exerted by the majority depends on its electoral margin and also not only on the number of parties which compose the group, that is, on how much fragmented the majority is (through the team production), but also on the fragmentation of the opposition group (through the contest). These theoretical results allow us to propose a measure of the bargaining power of two opposite political groups.

This prediction is tested in the case of the French *départements*. The estimates generally lend empirical support to the main conclusion of the theory. We find a significant correlation between relative political fragmentation and per capita social expenditures of French *départements*. The less fragmented the right-wing (left-wing) opposition, relative to the left-wing (right-wing) majority, the lower (higher) the social expenditures per head, *ceteris paribus*. Our political bargaining power index seems to have good empirical consistency.

Table 4. Estimation results (Pooled-OLS).^a

	Specification 1: All the départements	Specification 2: Left-wing départements	Specification 3: Right-wing départements	Specification 4: Left-wing départements	Specification 5: Right-wing départements
Intercept	-9.203*** (-14.296)	-8.663*** (-8.315)	-9.199*** (-10.106)	-7.862*** (-7.696)	-9.728*** (-10.508)
Tax share: $\ln(b_{i,t}^m/b_{i,t})$	-0.086* (-2.574)	-0.119* (-2.563)	-0.087· (-1.934)	-0.118** (-2.623)	-0.110* (-2.407)
Income: $\ln(y_{i,t}^m)$	0.453*** (6.949)	0.287* (2.589)	0.470*** (5.444)	0.240* (2.187)	0.513*** (5.864)
Grants: $\ln(s_{i,t})$	0.446*** (18.130)	0.354*** (7.731)	0.466*** (15.482)	0.359*** (7.449)	0.468*** (15.561)
Population: $\ln(N_{i,t})$	0.029* (2.480)	0.040** (2.788)	0.028 (1.480)	0.008 (0.546)	0.027 (1.412)
Share of elderly: $OLD_{i,t}$	0.660*** (3.641)	1.904*** (4.119)	0.467* (2.246)	1.792*** (4.011)	0.569** (2.696)
Population density: $\ln(DENS_{i,t})$	0.063*** (6.943)	0.090*** (6.469)	0.062*** (4.027)	0.102*** (7.444)	0.061*** (3.925)
Trend: $TREND_t$	0.012*** (4.024)	0.013** (2.962)	0.012** (3.265)	0.021*** (4.376)	0.012** (3.268)
Left-wing political bargaining power: $\ln(I_{i,t}^L)$	0.047*** (4.267)	0.035** (2.635)			
Right-wing political bargaining power: $\ln(I_{i,t}^R)$	-0.029*** (-3.409)		-0.026** (-2.693)		
Electoral margin of the majority: $\ln(RS_{i,t}^A)$				0.044** (2.803)	-0.027** (-2.783)
Herfindahl index of the majority: $\ln(HI_{i,t}^A)$				0.142* (2.214)	-0.144** (-2.667)
Herfindahl index of the opposition: $\ln(HI_{i,t}^B)$				-0.274*** (-4.508)	-0.033 (-0.876)
Adjusted R^2	0.6067	0.6354	0.5266	0.6645	0.5316
Number of observations	720	188	532	188	532

^a t value in parentheses.

***, **, *, and · indicate significance at 0.1%, 1%, 5% and 10% level, respectively.

Figure 2
Political bargaining power of the majority I^A

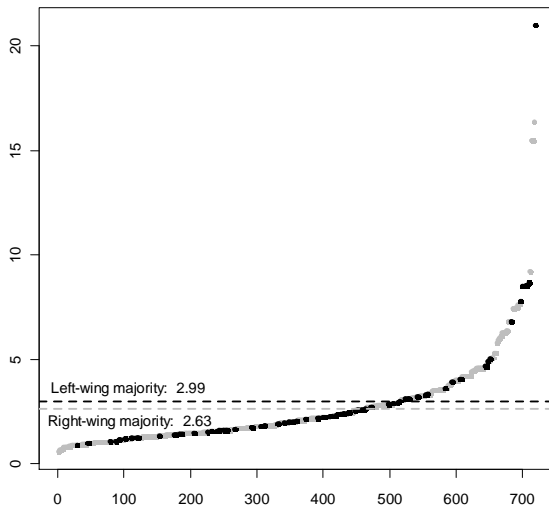


Figure 3
Electoral margin of the majority

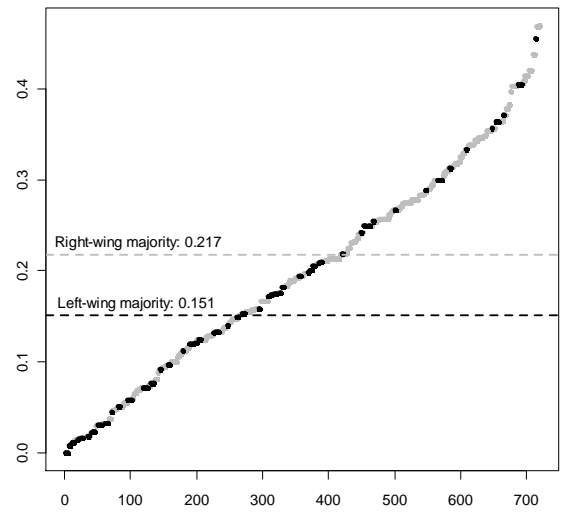


Figure 4
Herfindhal index of the majority HI^A

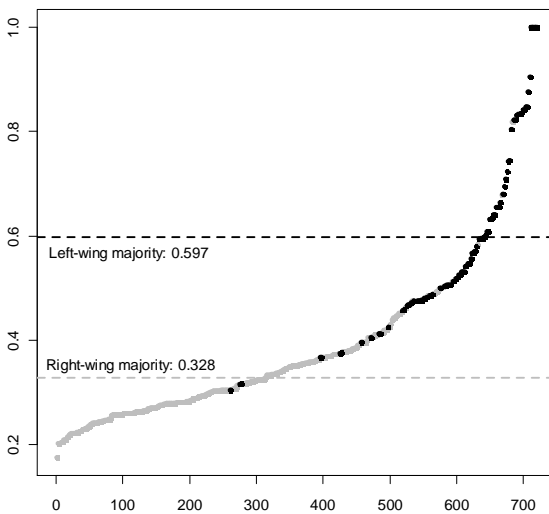
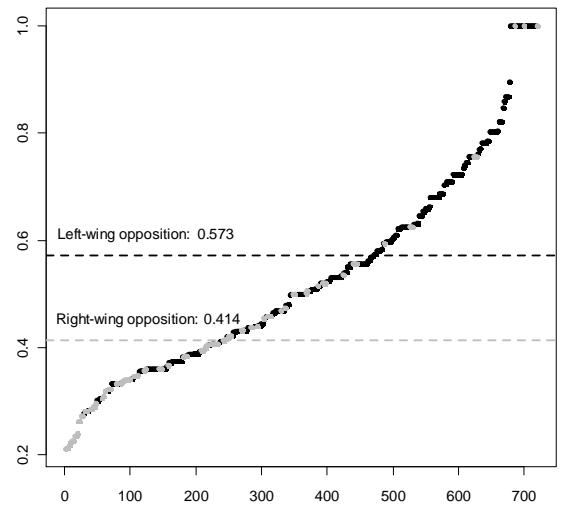


Figure 5
Herfindhal index of the opposition, HI^B



Notes

¹note: for instance Rogers (2002) applies this theory to the production of legislation in the American states

References

- Alchian, A. A. and Demsetz, H. (1972). Production, information costs, and economic organization. *American Economic Review*, 62:777–795.
- Ashworth, J. and Heyndels, B. (2005). Government fragmentation and budgetary policy in 'good' and 'bad' times in Flemish municipalities. *Economics and Politics*, 17:245–263.
- Banzhaf, J. F. (1965). Weighted voting doesn't work: A mathematical analysis. *Rutgers Law Review*, 19:317–343.
- Bergstrom, T. C. and Goodman, R. P. (1973). Private demand for public goods. *American Economic Review*, 63:286–296.
- Borge, L. E. (1995). Economic and political determinants of fee income in Norwegian local governments. *Public Choice*, 83:353–373.
- Borge, L. E. and Rattsø, J. (2002). Spending growth with vertical fiscal imbalance: Decentralized government spending in Norway, 1880-1990. *Economics and Politics*, 14:351–373.
- Boyne, G. A. (1996). *Constraints, choices and public policies*. Greenwich, CT.: JAI Press.
- Bradbury, J. C. and Crain, W. M. (2001). Legislative organization and government spending: cross-country evidence. *Journal of Public Economics*, 82:309–325.
- Breunig, R. and Rocaboy, Y. (2008). Per-capita public expenditures and population size: a non-parametric analysis using French data. *Public Choice*, 136:429–445.
- Buchanan, J. M. and Tullock, G. (1962). *The calculus of consent: Logical foundations of Constitutional Democracy*. Ann Arbor, University of Michigan Press.
- Crain, W. M. and Tollison, R. D. (1982). Team production in political majorities. *Micropolitics*, 2:111–121.
- de Haan, J., Sturm, J.-E., and Beekhuis, G. (1999). The weak government thesis: Some new evidence. *Public Choice*, 101:163–176.
- Edin, P. and Ohlsson, H. (1991). Political determinants of budget deficits: Coalition effects of versus minority effects. *European Economic Review*, 35:1597–1603.
- Falch, T. and Rattsø, J. (1999). Local public choice of school spending: Disaggregating the demand function for educational services. *Economics of Education Review*, 18:361–373.
- Huber, G., Kocher, M., and Sutter, M. (2003). Government strength, power dispersion in governments and budget deficits in OECD-countries: A voting power approach. *Public Choice*, 116:333–350.

- Kontopoulos, Y. and Perotti, R. (1999). Government fragmentation and fiscal policy outcomes: evidence from OECD countries. In Poterba, J. and von Hagen, J., editors, *Fiscal Institutions and Fiscal Performance*, pages 81–102. University of Chicago Press and NBER, Chicago.
- Kuster, S. and Botero, F. (2008). How many is too many? assessment of party system fragmentation measurements with data from latin america. Prepared for the 2008 APSA Annual Meeting.
- Olson, M. (1965). *The Logic of Collective Action*. Cambridge, harvard university press edition.
- Padovano, F. and Venturi, L. (2001). Wars of attrition in Italian government coalitions and fiscal performance: 1984-1994. *Public Choice*, 109:15–54.
- Perotti, R. and Kontopoulos, Y. (2002). Fragmented fiscal policy. *Journal of Public Economics*, 86:191–222.
- Pommerehne, W. (1978). Institutional approaches to estimating public expenditures: Empirical evidence from Swiss municipalities. *Journal of Public Economics*, 9:255–280.
- Poterba, J. M. (1994). State responses to fiscal crises: The effects of budgetary institutions and politics. *Journal of Political Economy*, 102:799–821.
- Rattsø, J. and Tovmo, P. (2002). Fiscal discipline and asymmetric adjustment of revenues and expenditures: Local government responses to shocks in denmark. *Public Finance Review*, 30:208–234.
- Rogers, J. R. (2002). Free-riding in state legislatures. *Public Choice*, 113:59–76.
- Roubini, N. and Sachs, J. D. (1989a). Government spending and budget deficits in the industrial countries. *Economic Policy*, 8:99–132.
- Roubini, N. and Sachs, J. D. (1989b). Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review*, 33:903–938.
- Skaperdas, S. (1996). Contest success functions. *Economic Theory*, 7:283–290.
- Tovmo, P. and Falch, T. (2002). The flypaper effect and political strength. *Economics of Governance*, 3:153–170.
- Tullock, G. (1980). Efficient rent seeking. In Buchanan, J., Tollison, R., and Tullock, G., editors, *Toward a theory of rent seeking society*, pages 97–112. College Station: TX, A&M University Press.
- Turnbull, G. K. and Mitias, P. M. (1999). The median voter model across levels of government. *Public Choice*, 99:119–138.

- Velasco, A. (2000). Debts and deficits with fragmented fiscal policy making. *Journal of Public Economics*, 76:105–125.
- Volkerink, B. and de Haan, J. (2001). Fragmented government effects on fiscal policy: new evidence. *Public Choice*, 109:221–242.
- Weingast, B., Shepsle, K. A., and Johnsen, C. (1981). The political economy of benefits and costs: A neoclassical approach to distributive politics. *Journal of Political Economy*, 89:642–664.