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Evidence from Spanish Municipalities**

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FULL CHARACTERISATION OF THE POLITICAL ECONOMY OF FISCAL ADJUSTMENT: EVIDENCE FROM SPANISH MUNICIPALITIES^a

Antoni Castells, Alejandro Esteller, Maite Vilalta^{b,c}

ABSTRACT: By means of a dynamic panel data analysis, and using a database from municipalities of the province of Barcelona (1993-99), we describe their process of fiscal adjustment to a shock in tax capacity. About 25% of the shock is internalized through an increase in tax effort, 35% through a reduction in public expenditure (mainly investment), while the rest is covered by an increase in the level of debt (i.e., the adjustment is delayed). However, this process of adjustment is very much influenced by the political situation of the municipality. Coalition and minority governments ("weak" governments) tend to delay the (unavoidable) adjustment, and 70% of their shock is covered by an increase in the level of debt, while the rest of municipalities ("strong" governments) adjust immediately. Leftist governments mostly react through increases in tax effort, while rightist governments reduce public expenditure to a greater extent. Finally, we find that municipalities are relatively reluctant to decrease taxes, that is, they react differently to a negative (28%) and a positive (26%) shock with regard to the level of tax effort.

Keywords: Fiscal federalism, fiscal adjustment, political economy.

JEL Classification: D78, H61, H62, H71, H72

RESUMEN: Mediante un análisis dinámico de un panel de datos, y utilizando una base de datos de municipios de la provincia de Barcelona (1993-99), describimos el proceso de ajuste fiscal ante un shock de capacidad fiscal. Alrededor de un 25% del shock es internalizado a través de un incremento del esfuerzo fiscal, un 35% a través de una reducción del gasto público (básicamente inversión), mientras que el resto es cubierto a través de un incremento del stock de deuda (i.e., el ajuste fiscal es aplazado). Sin embargo, este proceso está altamente influenciado por la situación política del municipio. Los gobiernos de coalición y de minoría (gobiernos "débiles") tienden a retrasar el (inevitable) ajuste, de forma que hasta un 70% de sus shock son cubiertos mediante un incremento del stock de deuda, mientras que el resto (gobiernos "fuertes") se ajustan inmediatamente. Los gobiernos de izquierda reaccionan principalmente mediante aumentos en el nivel de esfuerzo fiscal, mientras que los gobiernos de derecha reducen aún más su nivel de gasto público. Finalmente, los municipios se muestran relativamente reacios a disminuir el nivel de presión fiscal, esto es, respecto de la variación en el nivel de esfuerzo fiscal, los municipios reaccionan menos ante un shock negativo que ante uno positivo (28% vs. 26%).

Palabras clave: Federalismo fiscal, ajuste fiscal, economía política.

Clasificación JEL: D78, H61, H62, H71, H72

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1. Introduction

How does a local government react in front of a negative shock in its level of tax revenues? Does it immediately adjust its budget by increasing its level of tax effort and/or decreasing its level of expenditure? Or does it instead tend to delay the fiscal adjustment, incurring a deficit? These are the main questions we will address in this paper using a database of Spanish municipalities in the province of Barcelona for the period 1993 to 1999. Moreover, following the literature on political economy, we will test to what extent the political context affects the type of fiscal adjustment, i.e. according to this strand of the literature, we would expect a different adjustment between leftist and rightist governments, between “weak” and “strong” governments, or depending on whether the shock occurs in an electoral year or in any other year.

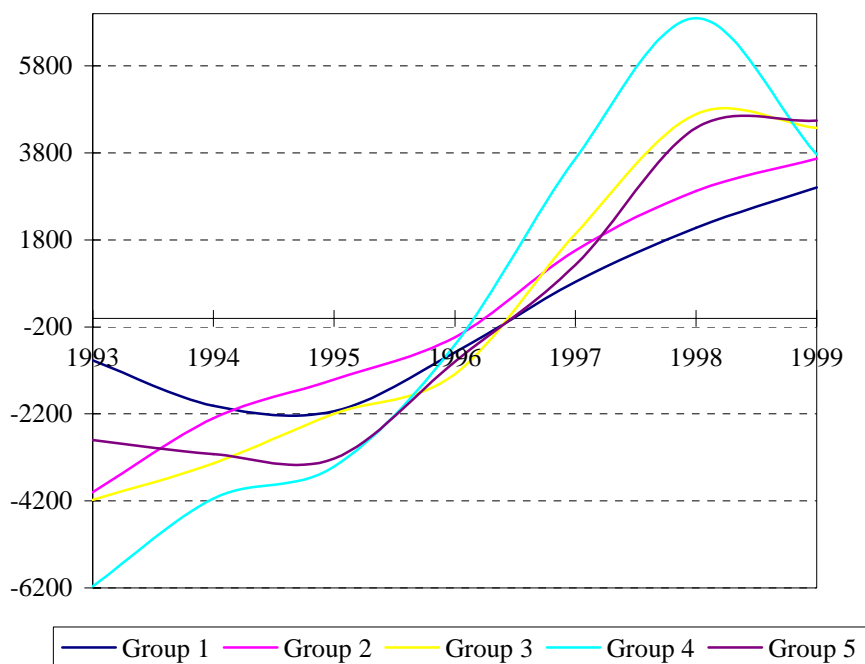
This type of hypothesis has mainly been applied to the central or intermediate layer of government (see Heyndels and Van Driessche, 2002 for a recent exception, applied to Flemish municipalities,). It therefore also seems interesting to apply it to the closest layer of government to the citizens, that is, local government. The closeness of this layer of government to citizens increases the transparency of the public sector activities, and the very process of accountability improves due to the greater importance of the welfare of each citizen in deciding the result of the next electoral contest (Seabright, 1996). In fact, there is some empirical evidence in favor of greater accountability by sub-central governments (e.g., Lederman et al., 2001; de Mello and Barenstein, 2001). We would therefore expect that “bad policies” (e.g., an excessive delay in the unavoidable fiscal adjustment¹) were less likely in this layer of government, or that the electoral process was useful in accounting for the performance of the incumbent (relatively more so than for non-local governments) (Barro, 1973).

We will attempt to fully characterize the process of fiscal adjustment, both on the revenue side (tax effort and deficit) and on the expenditure side (current and capital expenditure). This full characterization will permit us to discern which budgetary components are used more often in the case of a shock. For example, on the expenditure side, we would expect a greater reduction in capital expenditure than current

¹ Brender (2003) has found empirical evidence for the Israeli local governments that a larger current deficit significantly reduces the probability of re-election of the local incumbent.

expenditure, due to the greater discretionary nature of the former (Inman, 1995; Rattso, 1999). But it will also help us to identify whether our empirical results are fully consistent with those expected by the literature. For example, the literature predicts that “weak” governments incur relatively higher deficits, which stems from their relatively greater propensity to spend due to a “common-pool” problem (Velasco, 1997). The hypothesis concerning no-majority governments would have been verified (Perotti and Kontopoulos, 2002) only if those two results (higher level of deficit and of expenditure) simultaneously held. Furthermore, our empirical technique (*dynamic panel data*) will take the possibility of a sluggish adjustment of certain budgetary components into consideration. That is, in the analysis of the fiscal adjustment, we will differentiate between short run and long run responses, as some political or economic constraints might impede the local government to instantaneously achieve the desired variation in the level of certain budgetary components in order to overcome the shock².

Graph 1: Shocks of Local Potential Tax Revenues



Note: Group 1: municipalities with a number of inhabitants below 5,000 (N=41); Group 2: population between 5,001 and 20,000 (N=39); Group 3: population between 20,001 and 50,000 (N=13); Group 4: population between 50,001 and 100,000 (N=5); Group 5: number of inhabitants above 100,001 (N=6). All monetary amounts are expressed in 1999 ptas.

² See again Perotti and Kontopoulos (2002), p. 197, who stress the importance of introducing dynamics in these empirical analyses.

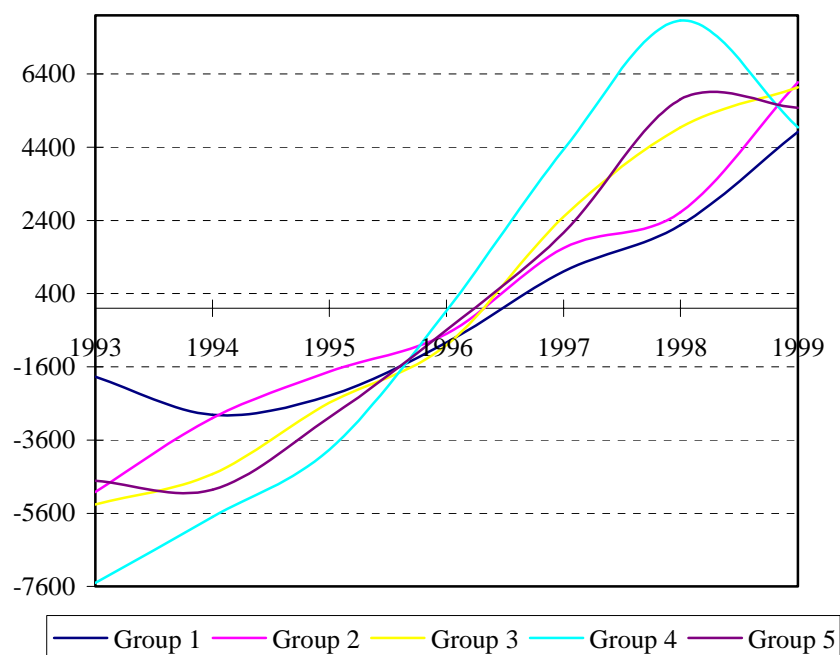
Usually, tax bases in the hands of local governments are very stable throughout the economic cycle. In Graph 1, the standard deviation of potential tax revenues (i.e., tax capacity) is shown throughout the period 1993-99³ (municipalities are aggregated by population size; while the potential level of tax revenues is calculated each year multiplying the average tax base of each group of municipalities by a global average tax rate throughout the entire period, so the tax rate does not have any impact on the evolution of potential tax revenues. Finally, to calculate the total value of potential tax revenues, we simply total the value obtained for each tax). However, as can be checked from the graph, for the municipalities included in our database, the evolution of their tax bases shows a downturn from 1993 till 1996, followed by a brief, but remarkable, upturn that seems to start collapsing in 1998. During this period, the coefficient of variation of potential tax revenues for the smallest group of municipalities is 6.36%, while for the biggest municipalities, it is 14.23% (although the lower level of representativeness of this latter group of municipalities, N=41 vs. N=6, respectively, must be taken into account⁴). The period of analysis therefore seems especially suitable for testing the process of fiscal adjustment, as there is some variability in the level of tax bases, and this was also a period of local economic downturn and upturn.

Dealing with sub-central governments also embodies a peculiarity that has to be taken into account. That is, we might wonder to what extent the intergovernmental grant system stabilizes any shock suffered by local governments. As long as there existed a properly designed intergovernmental grant system, the level of local (potential) tax revenues would be totally or partially stabilized around a reference level. In Graph 2, we thus present the standard deviation of local revenues calculated taking into account both the amount of potential tax revenues and revenue coming from the unconditional current grant system from the central government. As can be observed from the graph, these grants do not stabilize at all. In fact, it seems that they tend to act slightly pro-cyclically. It therefore makes sense to focus the analysis of the process of fiscal adjustment on the reactions carried out exclusively through the budget of local governments.

³ As we will see, according to our empirical technique, this will be the definition of shock that we will deal with.

⁴ In Spain the size of the municipalities is very small, this situation is so-called “local fragmentation”. For instance, according to Bosch et al. (2003), 86.2% of the municipalities have less than 5,000 inhabitants, while only 0.7% have more than 100,001 inhabitants.

Graph 2: Shocks of Local Potential Revenues



According to our empirical analysis, after a decrease in tax capacity, local governments reduce public expenditure by 35%, taxes increase by 25%, while the rest of the shock (40%) is overcome by means of an increase in the level of debt. However, the political situation of the municipality strongly determines that adjustment process. Those governments holding a majority of seats in the Town Council carry out the necessary fiscal adjustment immediately, since their level of debt hardly increases, and tend to reduce their level of public expenditure (81%) to a greater extent, which is basically capital expenditure (57%). Other governments tend to delay the (unavoidable) adjustment, since they mostly use debt to neutralize the shock (62%). We also find differences between leftist and rightist governments, since the former tend to react much more by means of increases in taxes (30%) than the latter (18%). Finally, although not directly related with the political situation, we find that municipalities react asymmetrically with respect to the level of tax effort, depending on whether they face a positive or a negative shock in tax capacity. Our results therefore show a certain reluctance by the municipalities to decrease taxes after a positive shock, since in absolute values that reaction is smaller than in the case of a negative shock.

The rest of the paper is organized as follows. In the next section, we review the main hypotheses concerning the political economy of fiscal adjustment. In section 3, we develop our empirical framework, and show the results of the empirical analysis. Finally, in section 4, we conclude.

2. Related literature on the political economy of fiscal adjustment

As far as the political economy of fiscal adjustment is concerned, we will focus on the potentially different reactions between leftist vs. rightist governments, electoral year vs. non-electoral year, and weak vs. strong governments (see Alesina et al., 1998, for a relatively recent review of these issues).

Leftist vs. Rightist Governments

According to the hypothesis of "partisan preferences", we should observe permanent differences in the *level* of the fiscal variables established by the municipalities according to their political orientation (see Hibbs, 1977; and the recent review and empirical analysis by Boix, 2000). There might also be a different *reaction* to a shock depending on the political orientation of the government. Leftist governments probably attach a lower weight to the marginal cost of taxation, and so after a negative shock in their level of tax capacity, tend to react more strongly by means of an increase in the level of tax effort than rightist governments do. The latter type of government might instead react by means of reductions in their level of expenditure, to which they probably confer a relatively lower weight in their objective function. The empirical results by Tavares (1999) tend to confirm this hypothesis of differential reactions. Finally, there is mixed evidence on whether right-wing governments are less deficit-prone than left-wing ones (Boix, 2000; Volkerink and de Haan, 2000; and Sapir and Sekkat, 2002 find empirical evidence confirming such hypothesis, while Alesina et al., 1998, do not), and there does not seem to be any significant difference in their ability to carry out successful fiscal adjustments (Alesina and Perotti, 1995). In our empirical analysis, though, we will not test the degree of success of a fiscal adjustment.

According to the traditional hypothesis of "partisan preferences" (see also Boix, 2000, for more elaborated hypothesis), we should thus observe a relatively greater level of public expenditure, and a greater level of tax effort and/or higher level of debt in the case of leftist governments⁵. But we will also test the hypothesis that leftist (rightist) governments, after a negative shock, tend to react more (less) on the revenue side (tax effort and increases in the level of debt) than on the expenditure side. Finally, we will test whether there is a delay in fiscal adjustment depending on the political orientation of the government, i.e., whether the volume of debt issued after an adverse shock depends on the political orientation of the government.

Electoral Year vs. Non Electoral Year

During or just before the electoral year, we should observe a convergence of the political platforms, and the establishment of expansive policies by the incumbent - i.e., either an increase in the level of public expenditure, or a decrease in the level of tax effort, or a combination of both, and so, ceteris paribus, a relatively greater budget deficit than in any other period - in order to increase its chances of re-election (Nordhaus, 1975; Lindbeck, 1976)⁶. This creates the well-known *political business cycle*. On the other hand, according to this approach, it seems reasonable to assume that after an adverse shock, we should observe a relatively smaller increase in tax effort and so a greater deficit in an electoral year, i.e. we would expect a delay in the fiscal adjustment.

With respect to the empirical test of the *political business cycle*, as Persson and Tabellini (2002) state, there are not conclusive results in the case of fiscal policy (see also the critical review by Drazen, 2000). According to those authors, this is mainly due to the fact that empirical analyses have mostly focused on monetary policy and to the fact that they have not been systematic enough. In any case, they conclude that there is

⁵ If the possibility of "strategic behavior" by the political parties is considered, the basic result concerning the issue of debt might reverse. In particular, if a rightist (leftist) party fears losing the next electoral contest, it will issue more (less) debt in order (not) to curtail the chances of spending of the leftist (rightist) party when it reaches the government (Persson and Svensson, 1989). See Petterson-Libdom (2001) for a favorable test of this hypothesis.

⁶ Even if there are "partisan preferences", the predicted convergence in expansionary policies might occur as long as the incumbent is uncertain about its chances of re-election (Wittman, 1977), though credibility problems about the post-election period might impede the convergence of the political platforms in the case of "rational voters" (Alesina, 1988).

certain evidence regarding the manipulation of fiscal policy before elections. In particular, Drazen (2000) points out to the opportunistic use of fiscal transfers to individuals before the elections by incumbents. Finally, with regard to the fiscal adjustment, Poterba (1994) finds that spending cuts and tax increases after an adverse shock are smaller in US states when governors are about to stand for election. There is thus some evidence of a delay in fiscal adjustment after adverse shocks during the electoral period (see also Persson and Tabellini, 2002, p. 10).

During or just before the "electoral year" we should therefore observe common behavior by the incumbents regardless of their political orientation, and they all should carry out expansionary fiscal policies (i.e., greater budget deficits). Finally, according to this line of reasoning, we should observe a longer delay in the process of fiscal adjustment after an adverse shock.

Also related with the electoral period are the so-called *electoral accountability models* (the origins being Barro, 1973, and Ferejohn, 1986; see also Besley and Case, 1995), according to which, due to the impossibility of writing a contract between voters and parties that binds the latter to good performance while in office, the elections are useful in creating incentives for good performance of the incumbent when it runs for re-election⁷. This strand of the literature predicts a lower level of "rents" in the incumbent's hands just before or during the elections, since then the incumbent aims at maximizing her chances of re-election⁸. As long as we interpret (part of) current expenditure as "rents" for the incumbent, we should observe a lower level of current expenditure and, as in the case of the classical "political business cycle" models, a lower level of tax effort just before or during the electoral period. With regard to the process of adjustment after an adverse shock, the reaction probably depends on the perception of the voters with respect to the characteristics of the shock. If they consider it is a common shock (and so it is not due to a particular bad performance by the incumbent), there should not be any difference compared to a non-electoral year. However, if it is a specific shock (this is the situation we will deal with in our empirical analysis due to the inclusion of a set of time effects), it seems reasonable to postulate that citizens will ask

⁷ Their normative implications are therefore, totally different from those on "electoral cycles".

⁸ The greater the value attached to the possibility of re-election in comparison with the utility that could be enjoyed from the current appropriation of "rents", the greater the expected reduction in rents.

for a fast fiscal adjustment, mostly through a another decrease in (“wasteful”) spending.

In the presence of asymmetric information about the "talent" of the incumbent, and supposing that voters aim at electing the most competent politician, the hypothesis that arises to be empirically tested is that just before or during the electoral period, public expenditure should be increased, while tax rates should be cut (Rogoff and Sibert, 1988; Rogoff, 1990). This is the so-called *signaling competence model*. This model therefore offers the same empirical predictions as the classical analysis of the "political business cycle". In this case, the explanation is that by incurring a deficit during or just before the electoral period the incumbent supposedly signals his/her ability to (easily) rebalance the public budget after the electoral contest. According to this hypothesis, after a negative shock in tax capacity during or before elections, we should observe a smaller decrease in public expenditure and/or a smaller increase in tax rates, and on the whole a delay in the (unavoidable) stabilization - which is not free of economic costs - until after the elections. In this way, voters will be able to infer the competence of the politicians, who are tempted to show off their ability in managing adverse budgetary shocks.

Two other models are therefore compatible with unusual behavior by the incumbent during the electoral year with totally different empirical predictions. The *electoral accountability model* predicts lower levels of expenditure and a faster process of fiscal adjustment, while the *signaling competence model* predicts higher levels of expenditure and a slower process of fiscal adjustment (like the "opportunistic model").

Weak vs. Strong Governments

Finally, there is the hypothesis that the degree of fragmentation of the government will crucially affect its fiscal responsibility. Basically, two different hypotheses stand out (see Persson and Tabellini, 2000, Chapter 13). The first one deals with a "common pool" problem. As long as the government consists of different parties (i.e., the government is a coalition of political parties, or the incumbent is governing in minority, and has to look for sporadic agreements with other political parties), they all will share a given level of net assets (i.e., tax capacity of the municipality). However, in forming their expenditure needs, each of the n members of the coalition will merely internalize $1/n$ of the marginal cost of its decision, while the marginal benefit will fully accrue to the coalition group. That is, each member of the coalition will underestimate the real

cost of raising funds to carry out additional expenditure. This hypothesis therefore predicts that regardless of the state of the economy, the level of public expenditure will be higher the greater the fragmentation of the government, which on average must produce greater budget deficits (Velasco, 1997)⁹.

The second hypothesis that arises in relation to the fragmentation of the government predicts a delay in fiscal stabilization after a negative shock. In this case, although the delay embodies economic costs (among others, a higher financial cost of debt and thus even higher taxes in the future), each member of the coalition attempts to make the costs of the (unavoidable) fiscal stabilization fall on the other/s member/s of the coalition (i.e., the necessary increase in taxes or the necessary decrease in public expenditure). This hypothesis thus predicts a delay in the stabilization, and so higher levels of deficit in the short run after an adverse shock (Alesina and Drazen, 1991).

Roubini and Sachs (1989) were the first authors to obtain empirical evidence of the impact of "political fragmentation" on the level of public expenditure and public deficit. They measured fragmentation by means of a variable that reaches its maximum value for those governments in minority and the minimum value for one-party majority parliamentary governments, and obtained significant evidence that the weaker the government (i.e., the higher the value of the qualitative variable) the greater the public deficit. Later, Edin and Ohlsson (1991) found that the empirical results by Roubini and Sachs (1989) were merely showing the effects of minority governments. Their interpretation of that result was that "... it is harder to negotiate in parliament than within a government" (p. 1597). However, Perotti and Kontopoulos (2002) have recently cast doubt on the basic results by Roubini and Sachs (1989), since the former found that the results of the latter were due to the fact that fragmented governments exerted a lower level of taxation, while theory predicts higher levels of public expenditure (Velasco, 1997).

The empirical results checking the effects of fiscal fragmentation are quite sensitive to the measurement of fragmentation, especially when the original coding suggested by Roubini and Sachs (1989) is used. In contrast with the previous empirical results cited,

⁹ There exists some evidence that those periods of acute financial crisis act as catalysts to reform in reducing the budget deficits, and so they should not be feared too much (Drazen and Grilli, 1992).

de Haan and Sturm (1997) and de Haan et al. (1999) found that the type of government was not a relevant variable in explaining government debt growth or government spending levels. Both papers reached this conclusion by correcting certain mistakes in the previous empirical analysis, using another data set and trying other definitions of "political fragmentation". As we have commented before, more recently Perotti and Kontopoulos (2002) have confirmed the results by Haan and Sturm (1997) and de Haan et al. (1999). The results with respect to the effect of political weakness on the growth of public debt and public expenditure are therefore not clear-cut and depend very much on how "fragmentation" is measured. In our case, we will adopt a broad measure of "fragmentation" (as we do not have any other piece of information about whether local governments govern in minority or in coalition), merely differentiating between those parties that hold by themselves a majority of seats in the parliament ("strong") and the rest ("weak").

However, none of the empirical analyses quoted distinguish between the delay in the fiscal adjustment and the higher level of public expenditure due to a "common pool" problem. Nevertheless, as a main difference with all the previous papers, Perotti and Kontopoulos (2002) - apart from a dummy variable indicating the degree of "political fragmentation" - have also included an interaction between their index of fragmentation and a variable identifying an adverse shock (identified by means of an increase in the unemployment rate). They anticipate that the greater the degree of fragmentation, the greater the impact of a negative shock on the public deficit, since they argue that during "bad times" the composition of the government is expected to be more relevant. Nevertheless, we are tempted to interpret this interaction as an empirical contrast of the hypothesis of "delayed stabilization". That is, the estimate of the interaction would take into account how a government reacts after a negative shock depending of its degree of political weakness. This is the approach we will follow in our empirical analysis.

On the whole, we will test whether the degree of fragmentation of the political governments has any influence on both the level of public expenditure and on public deficit, and also on the process of fiscal adjustment after a negative shock. In our case, the negative shock will be identified as a fall in the level of tax capacity, while we will use a very simple measure of political fragmentation - a dummy variable equal to one for all those parties in government that do not hold a majority of seats in the parliament

(and so have to form a coalition or governing in minority) and zero otherwise.

3. Empirical analysis

Under conditions of a negative shock in the level of potential tax revenues (i.e. tax capacity), a municipality will be forced either to decrease its level of public services, or to increase its level of tax effort, or to incur a budget deficit (and so delaying the budgetary adjustment), or to carry out a combination of all these fiscal policies. In this section, we aim to describe how the adjustment occurs by means of an econometric analysis, and whether this depends on the political situation of the municipality.

3.1. Empirical framework

In order to fulfill this purpose, we will estimate three equations: one for the decision concerning the level of expenditure (differentiating between current and capital expenditure), one for the level of tax effort, and one for the variation in the level of debt (i.e., for the budget deficit). These will be the endogenous variables in our empirical analysis. Given that all the budgetary decisions are presumably simultaneously adopted, the set of fiscal decisions – current and capital expenditure, tax effort and deficit - could be estimated by means of a simultaneous equation system. However, instead of adopting that econometric strategy, we have decided to formulate and estimate a reduced form of each one of the three equations. This implies that each one of the equations will have to be specified for all the exogenous variables of the model.

In order to set up the equations to be estimated, we initially adopt a very simple tax setting behavior in which the level of each component of the budget is chosen from the maximization of the welfare of a representative citizen (e.g., the "median voter"). According to this simple tax setting behavior, we should therefore find that the optimally chosen level of each budgetary variable is such that the marginal benefit of public good provision (current and capital expenditure) equals the marginal cost of exerting a higher level of tax effort *and* the marginal cost of raising the level of public debt. This relationship must also respect the budget constraint. The exogenous variables to be included in each one of the equations must therefore be related to (i) the marginal

benefit of public good provision; (ii) the marginal cost of exerting a higher level of tax effort; and (iii) the marginal cost of incurring in a budget deficit. The explanatory variables that have been included in order to attempt to account for all these factors are the following:

- *Tax Capacity (TC)*: if the level of tax effort is kept unchanged, a greater level of tax capacity increases the amount of tax revenues. Nevertheless, as long as the marginal utility of local public goods is decreasing, we would expect a reduction in the level of tax effort (i.e., part of the increase in tax revenues is returned to the citizens), unless there is fiscal illusion, or the marginal cost of public funds is decreasing in tax capacity (rich citizens are willing to suffer from higher levels of tax effort and/or from higher increases in the level of debt, which obviously means higher taxes in the future). The lower the marginal utility of public goods, the greater should be the reduction in tax effort and/or in the level of debt and consequently the lower the increase in public expenditure.

Tax Capacity is the key variable in our empirical analysis, as it is the source of the shock to the budget of local governments. Thus, the rest of explanatory variables included in the empirical analysis have to be considered as control variables.

- *Current grants (CG)*: we would expect the same sign as in the case of a variation in tax capacity, unless there is fiscal illusion. In this latter situation (this is the so-called "flypaper effect"), we should observe a greater increase in public expenditure than in the case of an increase of the same amount in tax revenues, and thus a smaller reduction in the level of tax effort and/or in the variation of the level of debt (Courant et al., 1979; Oates, 1979).
- *Capital grants (KG)*: this type of conditional transfer might require the recipient government to co-fund part of the investment. Given this characteristic, the expected sign of this variable with regard to each component of the budget is ambiguous. If the capital grant does not need co-financing, we would expect a positive effect on expenditure, and/or negative on the level of tax effort and/or on the variation of the level of debt (i.e. a greater amount of general resources, which were previously allocated to investment decisions, are now available either to spend, to reduce the level of tax effort and/or reduce the level of indebtedness). However, as long as the

capital grant implies the need for co-funding, the estimate of capital expenditure should also be positive, but strictly greater than one, while the sign of the resource variables (tax effort and/or public deficit) should be positive.

- *Population (Pop), Density (Dens)*: the variable Population is commonly employed as an indicator of expenditure needs. However, given that the amount of the main unconditional current grant allocated to each municipality (known as the "Participación Municipal en los Tributos del Estado"; hereafter the PMTE) is basically calculated from the population share, and its weight is increasing in the amount of population (see previous section), the estimate of the variable Population could also be taking the effect of this variable on the share of the PMTE into account. The square of population has been introduced in order to control for the possibility of scale economies (see, for the Spanish case, Bosch and Solé-Ollé, 2002)¹⁰. The variable Density - number of inhabitants by km² - has been included in the econometric specification, as another potential indicator of expenditure needs. The expected greater expenditure needs reflected by those two variables should therefore force the municipalities to exert a higher level of tax effort and/or to incur a deficit, unless the unconditional transfers (basically, the PMTE) have properly accounted for the cost impact of these factors in their formulation.
- *Income (Inc)*: this variable aims at including the preferences of each municipality - through the average income - with regard to public good provision. We would therefore expect a non-negative sign of the estimate of this variable with regard to public expenditure. Then, if public goods are really normal goods, we should also obtain a positive sign of this estimate with respect to tax effort and/or to the variation in the level of public debt.

Although the fiscal setting behavior we have in mind is related to the welfare maximization of a representative agent, there is no doubt that (optimal) fiscal decisions are adopted within a diverse political context - i.e., these decisions might also be influenced by the existence of partisan preferences, an "electoral cycle" or might depend on whether the government is either "weak" (i.e., it governs in minority or by

¹⁰ In fact, in the empirical estimation, we have increased the degree of the polynomial function as long as the introduction of a higher degree was statistically accepted. As we will show, we have therefore finally accepted the polynomial function of the variable "Population" to be of degree 4.

means of a coalition) or “strong” (it holds a majority of seats even without the need of forming a coalition). In the next section, we broaden the set of (traditional) explanatory variables concerning fiscal decisions in order to take into account the potential impact of the political context.

3.2. Empirical implementation

According to the explanations given in the previous section, the basic equation to be estimated is the following:

$$\begin{aligned}
 E_{it} = & \beta_1 TC_{it} + \beta_2 CG_{it} + \beta_3 KG_{it} + \\
 & + \beta_4 Pob + \beta_5 Pob^2 + \beta_6 Pob^3 + \beta_7 Pob^4 + \beta_8 Dens + \beta_9 Inc_{it} + \\
 & + \beta_{10} E_{it-1} + F_i + T_t + \mu_{it}
 \end{aligned} \tag{1}$$

This basic model will be estimated for each of the five endogenous variables (total expenditure: E ; capital expenditure: KE ; current expenditure: CE ; tax effort: TXE ; and public deficit: DEF). In expression [1], we have used endogenous variable total expenditure as an example. All the monetary variables are expressed in ptas. and p.c. terms. In the first row, the variables picking up the flow of resources of the local government, tax capacity (TC), current grants (CG) and capital grants (KG) appear. *Tax capacity* (TC) is also expressed in ptas., and has been calculated as follows:

$$TC_{it} = \sum_{j=1}^3 \bar{t}_j B_{ijt} \tag{2}$$

In order to construct the variable TC , we have considered the three main taxes in the hands of the Spanish municipalities (the property tax, the tax on economic activity and the vehicles tax). For example, in year t for the municipality i we have calculated for each j -tax the amount of revenue that could be collected if it applied a standard tax rate (\bar{t}_j) - calculated as the average of the period - on its tax base (B_{ijt}). By totalling all these three amounts, we obtain the potential tax revenue of municipality i in year t , precisely as expressed in [2], which by definition only depends on the level of the j -tax bases of municipality i in t . However, as it is already multiplied by a standard tax rate, it is easier to interpret how a variation in tax capacity affects the budget of the municipality.

In the second row, those variables concerning expenditure needs (*Pop* and *Dens*) and the preference for public good provision (*Inc*) are shown. Finally, in the third row, we include the lagged dependent variable in order to account for a sluggish adjustment of the endogenous variable after a variation in any of the exogenous variables. For example, after an exogenous variation in the amount of capital grants, the short run response of total expenditure is β_3 , while in the long run (once $E_{it} = E_{it-1}$), the response is $\beta_3/(1-\beta_{10})$. As a result, as long as we expect costs of adjustment to the new situation, $\beta_{10} > 0$. The greater the value of β_{10} , the greater the adjustment costs. We have also included a set of fixed (F_i) and time effects (T_t), while μ_{it} is the standard error term of the empirical estimation.

With regard to the endogenous variables, *Tax Effort (TEX)* has been calculated as follows:

$$TEX_{it} = \sum_{j=1}^3 t_{ijt} \bar{B}_j \quad [3]$$

The level of tax effort of municipality i with respect to the j -taxes in year t is thus calculated supposing that the municipality has the average tax base in each tax, \bar{B}_j (also calculated as the average of the period). In this way, year-to-year changes in the level of tax effort only depend on the variation of the statutory tax rates enacted by the municipality in each one of the j -taxes. However, as it is multiplied by a standard tax base, it again makes it easier to interpret the whole process of fiscal adjustment.

Given that current and capital transfers enter the normal definition of public deficit, which is an endogenous variable in our model, but at the same time both types of transfers are exogenous variables (i.e., in the equation of the deficit, in principle such variables appear both on the right-hand side and left-hand side), in order to carry out the empirical analysis we have had to redefine public deficit excluding those two variables. With respect to the equation in which deficit is the endogenous variable, we will thus obtain the following:

$$DEF_{it} = \beta_1 TC_{it} + \beta_2 CG_{it} + \beta_3 KG_{it} + \dots \quad [4]$$

where DEF_{it} does not include the value of the transfers. In order to obtain the normal definition of public deficit, we will therefore have to subtract CG_{it} and KG_{it} on both sides of expression [4], that is,

$$(DEF_{it} - CG_{it} - KG_{it}) = \beta_1 TC_{it} + (\beta_2 - 1)CG_{it} + (\beta_3 - 1)KG_{it} + \dots \quad [5]$$

Operating in this way, we obtain the normal definition of public deficit on the left-hand side of expression [5]. On the whole, in order to obtain the impact of current and capital transfers on the level of public deficit, we will have to subtract 1 of the estimates β_2 and β_3 , respectively.

As we justified in section 2, fiscal decisions of the municipality might also be influenced by the political context. The basic model will then be modified as follows:

$$\begin{aligned} E_{it} = & \beta_1 (TC_{it} \times D_{it}) + \beta_2 [TC_{it} \times (1 - D_{it})] + \beta_3 CG_{it} + \beta_4 KG_{it} + \\ & + \beta_5 Pob + \beta_6 Pob^2 + \beta_7 Pob^3 + \beta_8 Pob^4 + \beta_9 Dens + \beta_{10} Inc_{it} + \\ & + \beta_{11} E_{it-1} + \beta_{12} Left_{it} + \beta_{13} Weak_{it} + F_i + T_t + \mu_{it} \end{aligned} \quad [6]$$

On the one hand, we therefore permit a differential reaction of the municipality after a variation in the level of tax capacity according to its political situation. In particular, the dummy variable, D_{it} , will account for the following dichotomies: weak vs. strong governments, election year vs. non-election year, and left-wing governments vs. right-wing governments. But we will also test whether the municipality responds differently after a negative shock (decrease in tax capacity) than after a positive shock (increase in tax capacity). On the other hand, we will also permit the political context to affect the level of the budgetary variables. In particular, we have introduced a dummy for leftist governments (*Left*) and another one for those governments in minority or that govern in coalition (*Weak*); the potential effects of the electoral cycle on the level of the fiscal variables will be included in the time effects, although given that these will also be picking up other factors that vary year to year but equally for all the municipalities, it would be too risky to infer any conclusion from them about the fiscal impact of the electoral cycle.

In expressions [1] and [6], the exogenous variables appear in levels, while we aim at

characterizing the fiscal adjustment after a *shock* in tax capacity. However, as we have a panel data, and given the presence of municipal fixed effects, each exogenous variable may be interpreted as its deviation from municipal averages along the period of analysis (e.g., see Blanchard and Wolfers, 2000, p. C26; or Mélitz and Zumer, p. 270-1, equations [5] and [6]). Alternatively, other papers have defined the shock in tax revenues as the difference between the amount of budgeted tax revenues and the amount in fact collected (Poterba, 1994; Rattso, 1999); while other authors have opted to estimate a explanatory time series equation of tax revenues (e.g., Heyndels and Van Driessche, 2002). In our case, given that we do not have data about the amount of tax revenue budgeted and the period of analysis is so short, we think the approach adopted to measure shocks in tax revenue is the most reasonable.

TABLE 1: SUMMARY STATISTICS ($T=7; N=104$)

	<i>Mean</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Tax Capacity</i>	30.222,36	9.598,81	11.601,48	75.015,52
<i>Tax Effort</i>	27.186,89	4.210,70	16.916,68	41.432,42
<i>Total Expenditure</i>	90.580,98	26,332,80	33.394,09	261.735,07
<i>Current Expenditure</i>	64.306,94	14.899,68	30.626,98	128.871,07
<i>Capital Expenditure</i>	26.274,04	20.990,96	244,36	167.985,07
<i>Deficit</i>	39.147,25	43.090,07	10.636,32	129.917,33
<i>Current Grants</i>	21.617,18	4137,92	12.346,30	37.597,48
<i>Capital Grants</i>	9.227,07	10921,14	0	103.878,21
<i>Population (*10⁻³)</i>	22,07	42,77	0,60	268,84
<i>Density</i>	1.600,75	3.205,32	13,60	21.680,64
<i>Income</i>	1.731.281,13	260.773,83	1.101.460,76	2.865.128,27
<i>Left</i>	0,48	0,50	0	1
<i>Weak Government</i>	0,49	0,50	0	1

Note: all monetary units are expressed in p.c. terms and in ptas. of the year 1999;
Source: *Servei d'Informació Econòmica Municipal (SIEM)* (Diputació de Barcelona).

The presence of the lagged endogenous variable on the right-hand side of expressions [1] and [6] makes the OLS estimator seriously biased and inconsistent, unless t tends to

infinity (Nickell, 1981). The bias and inconsistency are due to the correlation of the lagged dependent variable with the individual specific effects. Given that the time period of our panel is very short, those problems must be taken into account. In order to tackle this situation, we will use the method proposed by Arellano and Bond (1991), which is specially suitable for short dynamic panels. This method consists of, firstly taking the differences of between models [1] and [6] (so we lose one year, 1993), and, secondly, following the example of public expenditure, using E_{it} (or for $t > 1$, all E_{it-1}) as an instrument of the differenced-lagged dependent variable on the right-hand side.

Table 1 shows the Statistics Summary of all the variables that we will employ in the empirical analysis.

3.3. Empirical results

The results of the empirical analysis are shown in Tables 2 to 9. We describe the main results concerning each one of the estimated equations separately:

- *Public Expenditure* (Tables 2, 3 and 4): in Model 1 of Table 2, we present the results of the basic model for total expenditure (the structure is the same for all the tables). We can check that public expenditure is positively related with tax capacity. The estimate is 0.342, while for current grants, it is much greater, 0.697, though the former is not statistically significant and the latter is only significant at the 90% confidence level. There thus emerges certain evidence of a "flypaper effect". Neither density nor income p.c. nor population have a statistically significant impact on public expenditure p.c., while capital grants have an important positive impact, 1.062, which indicates a certain degree of co-financing (for each 1 pta. of capital grants received by the municipality, it has to add 0.062 ptas. from its own resources for the investment project). The signs and values of all these variables are very similar in all the other models in Table 2, so they will not be commented on again. As expected, the estimate of the lagged value of the dependent variable is positive, though very small (0.099), and remains almost unchanged in all the rest of models. This suggests low costs of adjustment towards the (intertemporally) optimal level of public expenditure.

TABLE 2: TOTAL EXPENDITURE (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	0.3425 (1.199)	0.3407 (1.193)	--	--	--	--
<i>Tax Capacity * Shock (+)</i>	--	--	0.273 (0.914)	--	--	--
<i>Tax Capacity * Shock (-)</i>	--	--	0.244 (0.761)	--	--	--
<i>Tax Capacity * Strong Govt.</i>	--	--	--	0.807 (2.334)***	--	--
<i>Tax Capacity * Weak Govt.</i>	--	--	--	0.133 (0.435)	--	--
<i>Tax Capacity * Election</i>	--	--	--	--	0.709 (2.338)***	--
<i>Tax Capacity * NElection</i>	--	--	--	--	0.222 (0.774)	--
<i>Tax Capacity * Left</i>	--	--	--	--	--	0.215 (0.639)
<i>Tax Capacity * Right</i>	--	--	--	--	--	0.475 (1.347)
<i>Current Grants</i>	0.6967 (1.782)*	0.7095 (1.815)*	0.7189 (1.834)*	0.739 (1.898)*	0.541 (1.375)	0.701 (1.797)*
<i>Capital Grants</i>	1.062 (13.249)***	1.064 (13.274)***	1.069 (13.253)***	1.055 (13.183)***	1.051 (13.178)***	1.062 (13.270)***
<i>Pop</i>	836.866 (0.183)	1,055.032 (0.230)	1,288.170 (0.280)	3,697.143 (0.800)	-157.958 (-0.034)	911.517 (0.199)
<i>Pop²</i>	-15.361 (-0.196)	-24.166 (-0.306)	-26.840 (-0.338)	-45.737 (-0.577)	-1.221 (-0.015)	-24.276 (-0.308)
<i>Pop³</i>	0.096 (0.217)	0.151 (0.340)	0.163 (0.366)	0.225 (0.505)	0.034 (0.076)	0.153 (0.345)
<i>Pop⁴</i>	-0.0002 (-0.234)	-0.0003 (-0.364)	-0.0003 (-0.385)	-0.0004 (-0.470)	-0.0001 (-0.124)	-0.0003 (-0.368)
<i>Density</i>	-4.499 (-0.229)	-2.582 (-0.131)	-2.531 (-0.128)	-5.407 (-0.276)	0.509 (0.026)	-2.181 (-0.111)
<i>Income</i>	-0.004 (-0.289)	-0.004 (-0.313)	-0.004 (-0.308)	-0.003 (-0.215)	-0.005 (-0.389)	-0.004 (-0.327)
<i>Left</i>	--	1,912.165 (0.444)	1,810.38 (0.419)	1,340.353 (0.312)	1,466.052 (0.342)	9,316.317 (0.783)
<i>Weak Govt.</i>	--	-2,009.666 (-0.560)	-2,044.80 (-0.569)	17,593.206 (1.787)*	-1,463.690 (-0.409)	-2,163.062 (-0.603)
<i>T₉₅</i>	4,417.660 (1.942)*	4,390.447 (1.932)*	4,341.407 (1.906)*	4,020.602 (1.774)*	-8,989.073 (-1.965)**	4,465.003 (1.965)**
<i>T₉₆</i>	576.992 (0.226)	1,118.197 (0.420)	1,011.108 (0.377)	840.985 (0.317)	1,659.618 (0.625)	1,190.878 (0.447)
<i>T₉₇</i>	5,402.737 (1.620)	5,976.279 (1.743)*	5,911.573 (1.720)*	5,467.851 (1.601)	6,979.148 (2.039)**	6,097.320 (1.778)*
<i>T₉₈</i>	9,589.08 (1.671)*	10,184.769 (1.758)*	10,286.085 (1.773)*	9,070.391 (1.573)	11,671.849 (2.021)**	10,383.641 (1.792)*
<i>T₉₉</i>	16,409.29 (3.407)***	16,907.951 (3.474)***	17,207.836 (3.522)***	15,452.122 (3.187)***	1,987.727 (0.306)	17,117.276 (3.513)***
<i>Total Expenditure (-I)</i>	0.099 (1.993)**	0.100 (2.021)**	0.102 (2.050)**	0.101 (2.041)**	0.121 (2.441)***	0.097 (1.968)**
<i>Adj.-R²</i>	0.2670	0.2684	0.267	0.274	0.278	0.270

Note: *: 90% significant; **: 95% significant; ***: 99% significant

In Model 2, we have included a dummy variable to control for “partisan preferences” (dummy equal to 1 for leftist governments), and another one to control for the effects of “political fragmentation” (dummy equal to 1 for “weak” governments), but none of them is statistically significant. In Model 3, we have tested whether the municipalities react differently to a positive shock than to a negative shock in their level of tax capacity. The estimates obtained indicate that there is no statistically significant difference (we will try to be more precise on this issue later on).

In Model 4, we allow for a differential reaction depending on the degree of “political fragmentation”. In this case, we find that after an adverse shock in tax capacity, “strong” governments reduce their level of public expenditure until the reduction in tax revenue is almost fully compensated for (0.807), while other governments react much less (0.133), with only the first estimate being statistically significant. Moreover, when we allow for this differential reaction, we also find that the dummy variable that identifies “weak” governments becomes statistically significant. According to this latter variable, “weak” governments tend to spend about 17,600 ptas. p.c. more than “strong” governments. As far as non-majority governments are concerned, both the theory predicting a delay in stabilization and the theory predicting greater levels of expenditure are therefore confirmed.

In Model 5, we have tested whether the reaction to an adverse shock is different during the electoral year. Our results certainly detect a differential reaction. After an adverse shock, there is a relatively more important decrease in public expenditure during the electoral period (0.709) - being statistically significant - than in any other year (0.222) - which is not statistically different from zero. It thus seems that governments become more accountable the closer the electoral contest. However, this result must be cautiously taken into account, since we only have two electoral contests (1995 and 1999). The robustness of this result should thus be checked once we have more electoral periods available. Finally, in Model 6, we do not detect a differential reaction according to the political color of the local government.

TABLE 3: CURRENT EXPENDITURE (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	0.070 (1.144)	0.069 (1.139)	-. (.)	-. (.)	-. (.)	-. (.)
<i>Tax Capacity * Shock (+)</i>	-. (.)	-. (.)	0.047 (0.747)	-. (.)	-. (.)	-. (.)
<i>Tax Capacity * Shock (-)</i>	-. (.)	-. (.)	0.036 (0.539)	-. (.)	-. (.)	-. (.)
<i>Tax Capacity * Strong Govt.</i>	-. (.)	-. (.)	-. (.)	0.190 (2.564)***	-. (.)	-. (.)
<i>Tax Capacity * Weak Govt.</i>	-. (.)	-. (.)	-. (.)	0.016 (0.244)	-. (.)	-. (.)
<i>Tax Capacity * Election</i>	-. (.)	-. (.)	-. (.)	-. (.)	0.105 (1.591)	-. (.)
<i>Tax Capacity * NElection</i>	-. (.)	-. (.)	-. (.)	-. (.)	0.058 (0.940)	-. (.)
<i>Tax Capacity * Left</i>	-. (.)	-. (.)	-. (.)	-. (.)	-. (.)	0.083 (1.155)
<i>Tax Capacity * Right</i>	-. (.)	-. (.)	-. (.)	-. (.)	-. (.)	0.054 (0.713)
<i>Current Grants</i>	0.402 (4.791)***	0.399 (4.749)***	0.403 (4.793)***	0.408 (4.911)***	0.378 (4.388)***	0.400 (4.751)***
<i>Capital Grants</i>	0.003 (0.198)	0.004 (0.217)	0.005 (0.294)	0.001 (0.077)	0.002 (0.141)	0.004 (0.220)
<i>Pop</i>	-5,628.429 (-5.722)***	-5,735.486 (-5.814)***	-5,614.145 (-5.638)***	-5,147.013 (-5.195)***	-5,763.478 (-5.787)***	-5,712.821 (-5.771)***
<i>Pop²</i>	81.235 (4.848)***	82.922 (4.915)***	81.506 (4.810)***	76.999 (4.574)***	84.107 (4.935)***	82.846 (4.909)***
<i>Pop³</i>	-0.402 (-4.279)***	-0.413 (-4.350)***	-0.407 (-4.271)***	-0.389 (-4.124)	-0.419 (-4.375)***	-0.413 (-4.347)***
<i>Pop⁴</i>	0.001 (3.972)***	0.001 (4.050)***	0.001 (3.985)***	0.001 (3.891)***	0.001 (4.073)***	0.001 (4.047)***
<i>Density</i>	-0.221 (-0.052)	-0.029 (-0.007)	-0.037 (-0.009)	-0.455 (-0.109)	0.097 (0.023)	-0.073 (-0.017)
<i>Income</i>	0.003 (1.214)	0.003 (1.179)	0.003 (1.179)	0.004 (1.320)	0.003 (1.074)	0.003 (1.190)
<i>Left</i>	-. (.)	467.668 (0.504)	435.271 (0.470)	380.096 (0.414)	414.893 (0.444)	-373.741 (-0.146)
<i>Weak Govt.</i>	-. (.)	752.498 (0.970)	760.932 (0.982)	5,838.316 (2.808)***	837.495 (1.068)	769.266 (0.989)
<i>T₉₅</i>	2,937.084 (5.896)***	2,959.868 (5.933)***	2,940.415 (5.900)***	2,843.030 (5.754)***	1,735.103 (1.769)*	2,955.268 (5.917)***
<i>T₉₆</i>	3,798.182 (6.664)***	3,675.750 (6.143)***	3,631.857 (6.044)***	3,663.646 (6.191)***	3,667.209 (6.084)***	3,660.931 (6.095)***
<i>T₉₇</i>	6,048.272 (8.069)***	5,928.099 (7.670)***	5,892.764 (7.615)***	5,880.506 (7.694)***	5,933.445 (7.617)***	5,902.481 (7.591)***
<i>T₉₈</i>	8,962.314 (6.946)***	8,850.646 (6.772)***	8,878.958 (6.810)***	8,729.238 (6.756)***	8,839.471 (6.713)***	8,803.925 (6.690)***
<i>T₉₉</i>	11,049.16 (8.735)***	10,915.529 (8.503)***	11,016.922 (8.632)***	10,802.985 (8.510)***	9,211.091 (5.591)***	10,862.416 (8.386)***
<i>Current Expenditure (-I)</i>	0.051 (0.632)	0.058 (0.715)	0.057 (0.712)	0.034 (0.432)	0.093 (1.141)	0.061 (0.750)
<i>Adj.-R²</i>	0.103	0.102	0.103	0.120	0.092	0.100

Note: *: 90% significant; **: 95% significant; ***: 99% significant

TABLE 4: CAPITAL EXPENDITURE (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	0.221 (0.798)	0.217 (0.782)	--	--	--	--
<i>Tax Capacity * Shock (+)</i>	--	--	0.165 (0.568)	--	--	--
<i>Tax Capacity * Shock (-)</i>	--	--	0.141 (0.452)	--	--	--
<i>Tax Capacity * Strong Govt.</i>	--	--	--	0.575 (1.713)*	--	--
<i>Tax Capacity * Weak Govt.</i>	--	--	--	0.059 (0.198)	--	--
<i>Tax Capacity * Election</i>	--	--	--	--	0.541 (1.836)*	--
<i>Tax Capacity * NElection</i>	--	--	--	--	0.110 (0.397)	--
<i>Tax Capacity * Left</i>	--	--	--	--	--	0.064 (0.197)
<i>Tax Capacity * Right</i>	--	--	--	--	--	0.385 (1.123)
<i>Current Grants</i>	0.300 (0.789)	0.323 (0.651)	0.330 (0.866)	0.359 (0.946)	0.217 (0.572)	0.313 (0.823)
<i>Capital Grants</i>	1.059 (13.880)***	1.062 (13.916)***	1.067 (13.852)***	1.056 (13.840)***	1.050 (13.880)***	1.061 (13.919)***
<i>Pop</i>	6,220.785 (1.337)	6,476.499 (1.392)	6,612.364 (1.417)	8,408.640 (1.801)*	5,729.031 (1.238)	6,259.625 (1.345)
<i>Pop</i> ²	-92.208 (-1.178)	-102.186 (-1.300)	-103.907 (-1.318)	-117.170 (-1.487)	-85.258 (-1.091)	-101.794 (-1.297)
<i>Pop</i> ³	0.470 (1.076)	0.535 (1.217)	0.543 (1.231)	0.5823 (1.323)	0.449 (1.029)	0.535 (1.217)
<i>Pop</i> ⁴	-0.001 (-1.028)	-0.001 (-1.180)	-0.001 (-1.191)	-0.001 (-1.242)	-0.001 (-1.015)	-0.001 (-1.181)
<i>Density</i>	-3.569 (-0.188)	-1.685 (-0.089)	-1.503 (-0.080)	-3.607 (-0.190)	0.854 (0.045)	-1.180 (-0.062)
<i>Income</i>	-0.008 (-0.678)	-0.009 (-0.703)	-0.009 (-0.700)	-0.008 (-0.613)	-0.009 (-0.738)	-0.009 (-0.729)
<i>Left</i>	--	1,493.601 (0.358)	1,419.362 (0.340)	1,041.148 (0.250)	1,017.237 (0.246)	10,638.718 (0.923)
<i>Weak Govt.</i>	--	-3,017.416 (-0.861)	-3,066.759 (-0.873)	11,884.254 (1.240)	-2,317.140 (0.246)	-3,210.309 (-0.917)
<i>T</i> ₉₅	1,487.531 (0.675)	1,434.533 (0.651)	1,387.050 (0.628)	1,113.025 (0.505)	-10,474.86 (-2.334)***	1,531.100 (0.695)
<i>T</i> ₉₆	-2,998.531 (-1.216)	-2,294.975 (-0.890)	-2,387.119 (-0.921)	-2,538.803 (-0.987)	-1,888.212 (-0.738)	-2,209.900 (-0.858)
<i>T</i> ₉₇	-95.112 (-0.029)	656.412 (0.197)	601.573 (0.180)	225.777 (0.068)	1,367.692 (0.413)	807.302 (0.242)
<i>T</i> ₉₈	1,693.938 (0.304)	2,468.805 (0.438)	2,556.501 (0.452)	1,525.561 (0.271)	3,505.356 (0.626)	2,734.462 (0.484)
<i>T</i> ₉₉	6,330.934 (1.361)	6,980.809 (1.482)	7,234.848 (1.527)	5,766.173 (1.228)	-6,415.776 (-1.018)	7,221.930 (1.532)
<i>Capital Expenditure (-1)</i>	0.109 (2.350)***	0.113 (2.417)***	0.116 (2.449)***	0.115 (2.475)***	0.117 (2.534)***	0.111 (2.377)***
<i>Adj.-R</i> ²	0.264	0.265	0.263	0.267	0.280	0.267

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

In Tables 3 and 4, we have disintegrated public expenditure between current and capital expenditure, respectively. From those estimations, we observe that local governments tend to react mainly through reductions in the level of capital expenditure (according to Model 1, 0.070 vs. 0.221, though none of these estimates is statistically significant). This suggests a relatively greater degree of flexibility of capital expenditure than current expenditure (Inman, 1995). With respect to a potentially different reaction depending on the degree of fragmentation and the closeness to the electoral year, the results obtained in the case of aggregate public expenditure are confirmed, though there is no statistically significant difference in the case of current expenditure and the electoral year. These results thus cast serious doubts on the hypothesis that elections account for the performance of the incumbent. Instead the reduction in expenditure might simply reflect an excess of investment in the years prior to the elections in such a way that projects tend to be finished during the electoral year itself. The positive estimate of capital grants is only significant in the equation of capital expenditure. Finally, the variable population is only significant with respect to current public expenditure. The impact of this variable is non-linear, and follows a similar pattern to the one obtained by Bosch and Solé-Ollé (2002). For low levels of population, the relationship is negative (evidence of scale-economies); once a minimum has been attained, the relationship becomes positive until it reaches a maximum; from then on, the relationship tends to become null or even becomes negative again. Finally, the lagged endogenous variable is only significant in the case of capital expenditure (with a value around 0.11), suggesting the adequacy of the dynamic specification for this variable due to the costs of adjustment, which are not present in the case of current expenditure, though its estimate is positive as expected.

- *Tax Effort* (Table 5): from Model 1, we observe that tax effort negatively depends on tax capacity. As suggested in section 2, this means that part of a positive shock in tax capacity is "returned" to the citizens through a reduction in tax effort. In particular, after an increase of 1 pta. in tax capacity, local governments return 0.25 ptas. Nevertheless, in contrast with this first result, tax effort is independent of the amount of current grants. The functional relationship of tax effort with respect to population is identical to the previous one obtained in the estimated equation of current expenditure p.c. The other control variables do not exert a significant

influence on the level of tax effort. Finally, the estimate of the lagged dependent variable (0.335) is greater than in the case of public expenditure, which indicates the difficulty in immediately reaching the long run level of tax effort after the adverse shock.

Model 2 provides some evidence of a lower level of tax effort by “weak” governments. From the other models, we do not find any different statistically significant reaction according to the political situation, with the exception of Model 6. According to this, after an adverse shock leftist governments tend to increase taxes (0.301) much more than rightist governments do (0.182). Once we allow for this differential reaction, we find that leftist governments also exert a relatively higher level of tax effort independently of the economic situation. Hence, the results seem to confirm the hypotheses set up in section 2 concerning “partisan preferences”.

TABLE 5: TAX EFFORT (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	-0.244 (-12.761)***	-0.244 (-12.889)***	-. -	-. -	-. -	-. -
<i>Tax Capacity * Shock (+)</i>	-. -	-. -	-0.243 (-11.962)***	-. -	-. -	-. -
<i>Tax Capacity * Shock (-)</i>	-. -	-. -	-0.243 (-11.019)***	-. -	-. -	-. -
<i>Tax Capacity * Strong</i>	-. -	-. -	-. -	-0.233 (-10.048)***	-. -	-. -
<i>Tax Capacity * Weak</i>	-. -	-. -	-. -	-0.249 (-12.282)***	-. -	-. -
<i>Tax Capacity * Election</i>	-. -	-. -	-. -	-. -	-0.244 (-11.999)***	-. -
<i>Tax Capacity * NElection</i>	-. -	-. -	-. -	-. -	-0.244 (-12.897)***	-. -
<i>Tax Capacity * Left</i>	-. -	-. -	-. -	-. -	-. -	-0.301 (-14.109)***
<i>Tax Capacity * Right</i>	-. -	-. -	-. -	-. -	-. -	-0.182 (-8.197)***
<i>Current Grants</i>	0.010 (0.402)	0.013 (0.506)	0.013 (0.497)	0.014 (0.551)	0.015 (0.567)	0.009 (0.377)
<i>Capital Grants</i>	-0.002 (-0.292)	-0.002 (-0.297)	-0.002 (-0.301)	-0.002 (-0.340)	-0.002 (-0.312)	-0.002 (-0.389)
<i>Pop</i>	-1,798.127 (-5.600)***	-1,757.051 (-5.537)***	-1,757.928 (-5.521)***	-1,703.961 (-5.347)***	-1,737.970 (-5.481)***	-1,819.488 (-5.996)***
<i>Pop²</i>	27.044 (5.021)***	26.175 (4.898)***	26.181 (4.887)***	25.743 (4.805)***	26.073 (4.882)***	26.312 (5.155)***
<i>Pop³</i>	-0.120 (-3.990)***	-0.114 (-3.830)***	-0.115 (-3.822)***	-0.113 (-3.777)***	-0.114 (-3.821)***	-0.115 (-4.035)***
<i>Pop⁴</i>	0.0002 (3.283)***	0.0002 (3.096)***	0.0002 (3.091)***	0.0002 (3.064)***	0.0002 (3.089)***	0.0002 (3.274)***
<i>Density</i>	1.695 (1.299)	1.694 (1.310)	1.697 (1.310)	1.633 (1.263)	1.671 (1.298)	1.783 (1.444)
<i>Income</i>	0.0004 (0.501)	0.0004 (0.494)	0.0004 (0.487)	0.0005 (0.539)	0.0005 (0.549)	0.0003 (0.342)
<i>Left</i>	-. -	-139.883 (-0.490)	-138.028 (-0.482)	-148.942 (-0.522)	-151.596 (-0.534)	3,240.219 (4.319)***
<i>Weak Govt.</i>	-. -	-418.612 (-1.759)*	-416.054 (-1.747)*	51.955 (0.079)	-414.237 (-1.746)*	-500.074 (-2.199)**
<i>T₉₅</i>	83.454 (0.549)	79.494 (0.530)	79.930 (0.532)	70.078 (0.467)	73.057 (0.238)	122.274 (0.852)
<i>T₉₆</i>	761.584 (4.479)***	833.349 (4.751)***	834.703 (4.737)***	827.327 (4.719)***	826.944 (4.728)***	870.235 (5.189)***
<i>T₉₇</i>	1,296.012 (5.824)***	1,369.516 (6.070)***	1,370.926 (6.058)***	1,357.287 (6.020)***	1,361.026 (6.044)***	1,446.967 (6.693)***
<i>T₉₈</i>	2,037.481 (5.366)***	2,109.993 (5.574)***	2,109.320 (5.558)***	2,083.365 (5.513)***	2,090.597 (5.537)***	2,238.511 (6.168)***
<i>T₉₉</i>	2,194.459 (6.786)***	2,260.804 (7.000)***	2,255.158 (6.890)***	2,227.411 (6.900)***	2,240.482 (5.148)***	2,385.875 (7.703)***
<i>Tax Effort (-1)</i>	0.335 (5.071)***	0.319 (4.884)***	0.323 (4.730)***	0.319 (4.886)***	0.311 (4.804)***	0.273 (4.320)***
<i>Adj.-R²</i>	0.213	0.224	0.223	0.225	0.229	0.275

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

- *Deficit* (Table 6): according to the results of Model 1, we observe that those governments that bear an adverse shock in tax capacity tend to increase their level of debt (0.401), though the estimate is not statistically significant. As far as the other variables are concerned, only the estimates of capital and current grants are statistically significant. However, it should be recalled that these variables were originally excluded from the definition of the deficit (see expression [5]), so the value of 0.685 means that after an increase of 1 pta. in the amount of current transfers, the local government reduces its level of indebtedness in 0.315 ptas. (i.e., $0.685 - 1$). In the case of capital transfers, it means that the municipality incurs in a deficit of 0.071 ptas. after an increase of 1 pta. in capital grants. This is due to the co-funding required by capital transfers. From Model 2, we do not observe any difference in the levels of deficit according to the political color or the degree of fragmentation of the government. As shown in Model 3, we have not found any difference in the variation in the level of debt depending on whether the government bears an adverse or positive shock in tax capacity either.

From Model 4, we observe that “weak” governments tend to delay stabilization after an adverse shock, since they increase their level of debt by 0.622 ptas. However, “strong” governments tend to adjust immediately, and so do not react by incurring a deficit (i.e., the interaction between the dummy *Strong Gvt.* and *Tax Capacity* is not statistically significant). “Weak” governments do not only tend to delay the adjustment, but they also show greater levels of deficit regardless of the state of the economy. In particular, *ceteris paribus*, their deficit is 18,200 ptas. p.c. (approx.) greater than the deficit of “strong” governments. Both the theory predicting a delay in the fiscal adjustment and the theory predicting higher levels of deficit of “weak” governments have therefore been confirmed.

TABLE 6: DEFICIT (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	-0.401 (-1.400)	-0.403 (-1.408)	-. -	-. -	-. -	-. -
<i>Tax Capacity * Shock (+)</i>	-. -	-. -	-0.439 (-1.462)	-. -	-. -	-. -
<i>Tax Capacity * Shock (-)</i>	-. -	-. -	-0.452 (-1.403)	-. -	-. -	-. -
<i>Tax Capacity * Strong Govt.</i>	-. -	-. -	-. -	0.075 (0.217)	-. -	-. -
<i>Tax Capacity * Weak Govt.</i>	-. -	-. -	-. -	-0.622 (-2.018)**	-. -	-. -
<i>Tax Capacity * Election</i>	-. -	-. -	-. -	-. -	-0.052 (-0.172)	-. -
<i>Tax Capacity * NElection</i>	-. -	-. -	-. -	-. -	-0.520 (1.819)*	-. -
<i>Tax Capacity * Left</i>	-. -	-. -	-. -	-. -	-. -	-0.418 (-1.238)
<i>Tax Capacity * Right</i>	-. -	-. -	-. -	-. -	-. -	-0.383 (-1.079)
<i>Current Grants</i>	0.685 (1.745)*	0.697 (1.775)*	0.700 (1.778)*	0.740 (1.889)*	0.578 (1.470)	0.697 (1.776)*
<i>Capital Grants</i>	1.071 (13.453)***	1.074 (13.479)***	1.076 (13.435)***	1.067 (13.397)***	1.060 (13.425)***	1.074 (13.480)***
<i>Pop</i>	1,036.397 (0.220)	1,165.514 (0.247)	1,268.846 (0.269)	3,690.221 (0.779)	204.973 (0.044)	1,130.450 (0.240)
<i>Pop²</i>	-27.048 (-0.339)	-35.023 (-0.436)	-36.150 (-0.449)	-54.761 (-0.680)	-13.848 (-0.173)	-34.529 (-0.430)
<i>Pop³</i>	0.153 (0.342)	0.205 (0.455)	0.209 (0.464)	0.268 (0.594)	0.095 (0.212)	0.202 (0.450)
<i>Pop⁴</i>	-0.0003 (-0.343)	-0.0004 (-0.464)	-0.0004 (-0.470)	-0.0004 (-0.545)	-0.0002 (-0.244)	-0.0004 (-0.460)
<i>Density</i>	-1.320 (-0.067)	0.810 (0.041)	0.851 (0.043)	-1.832 (-0.093)	3.723 (0.191)	0.749 (0.038)
<i>Income</i>	-0.004 (-0.312)	-0.004 (-0.336)	-0.004 (-0.330)	-0.003 (-0.234)	-0.005 (-0.373)	-0.004 (-0.349)
<i>Left</i>	-. -	2,311.893 (0.535)	2,252.510 (0.521)	1,726.650 (0.400)	1,763.797 (0.412)	3,351.556 (0.280)
<i>Weak Govt.</i>	-. -	-1,981.803 (-0.547)	-1,983.752 (-0.547)	18,193.640 (1.834)*	-1,285.625 (-0.358)	-1,978.984 (-0.546)
<i>T₉₅</i>	4,386.763 (1.926)*	4,364.426 (1.917)*	4,344.893 (1.905)*	3,962.041 (1.742)*	-8,556.134 (1.854)*	4,379.700 (1.921)*
<i>T₉₆</i>	24.613 (0.010)	596.621 (0.224)	553.789 (0.207)	293.056 (0.110)	1,029.437 (0.389)	609.756 (0.228)
<i>T₉₇</i>	4,616.459 (1.380)	5,232.076 (1.518)	5,215.493 (1.510)	4,720.146 (1.373)	6,029.191 (1.760)*	5,256.900 (1.523)
<i>T₉₈</i>	8,440.112 (1.466)	9,088.790 (1.560)	9,145.947 (1.569)	7,950.161 (1.369)	10,251.568 (1.772)*	9,150.281 (1.568)
<i>T₉₉</i>	15,377.00 (3.198)***	15,935.305 (3.274)***	16,098.521 (3.292)***	14,411.383 (2.969)***	1,389.104 (0.214)	15,973.677 (3.274)***
<i>Deficit (-1)</i>	0.106 (2.166)**	0.109 (2.211)**	0.110 (2.218)**	0.114 (2.325)**	0.119 (2.428)***	0.108 (2.194)**
<i>Adj.-R²</i>	0.263	0.264	0.263	0.267	0.278	0.264

Note: *: 90% significant; **: 95% significant; ***: 99% significant

There is also a difference in the reaction with regard to the accumulation of debt depending on whether the government is close or not to an electoral year (Model 5). While there is evidence of a delay in the adjustment when the electoral period is not close (the estimated increase in debt is 0.520), the fiscal adjustment is instantaneous during the electoral year (i.e., there is no increase in the level of debt), although as mentioned above, caution should be exercised with respect to these results. Finally, Model 6 does not show any difference in the delay of the fiscal adjustment depending on the political color of the government, nor different levels of deficit (i.e., the dummy variable “Left” is not statistically significant).

We have therefore shown how important it is to distinguish between municipalities according to their political situation. We did not find any other statistically significant estimates that permit us to discern the process of fiscal adjustment after an adverse shock (see Model 1 of each table). In fact, the key political characteristics to be taken into account are the degree of political fragmentation and the electoral period. With the exception of tax effort, the estimates are statistically significant and it is possible to describe the process of fiscal adjustment only when we allow for a differential reaction according to those two political characteristics.

In Table 7, we have redefined the dummy variable "negative shock". Instead of simply defining a "negative shock" as a situation in which the tax capacity of a municipality has fallen, a "negative shock" is identified when tax capacity has decreased by 4% (we tried lower thresholds, but then there was not a statistically significant different reaction). Once we redefine this dummy variable in this way, we obtain an asymmetric reaction in the estimated equation of tax effort. In particular, we find that the (negative) reaction is greater in absolute values in the case of a negative shock (0.276 vs. 0.263). The municipalities thus tend to be more responsive when they have to raise taxes than when they have to cut them.

TABLE 7: FURTHER EVIDENCE OF ASYMMETRIC REACTIONS (N*T= 648)

	<i>Total Expenditure</i>	<i>Current Expenditure</i>	<i>Capital Expenditure</i>	<i>Tax Effort</i>	<i>Deficit</i>
<i>Tax Capacity * Shock (+)</i>	0.300 (1.022)	0.049 (0.784)	0.199 (0.696)	-0.263 (-13.711)***	-0.396 (-1.343)
<i>Tax Capacity * Shock (-)</i>	0.279 (0.856)	0.037 (0.536)	0.179 (0.566)	-0.276 (-12.876)***	-0.386 (-1.180)
<i>Current Grants</i>	0.706 (1.807)*	0.399 (4.751)***	0.327 (0.860)	0.013 (0.499)	0.694 (1.769)*
<i>Capital Grants</i>	1.065 (13.283)***	0.003 (0.205)	1.062 (13.911)***	-0.002 (-0.375)	1.074 (13.482)***
<i>Pop</i>	1,144.434 (0.250)	-5,708.419 (-5.785)***	6,493.245 (1.395)	-1,721.532 (-5.579)***	1,158.421 (0.246)
<i>Pop²</i>	-24.146 (-0.305)	83.225 (4.945)***	-101.503 (-1.290)	26.529 (5.099)***	-35.400 (-0.441)
<i>Pop³</i>	0.149 (0.336)	-0.416 (-4.389)***	0.530 (1.204)	-0.118 (-4.040)***	0.207 (0.460)
<i>Pop⁴</i>	-0.0003 (-0.358)	0.001 (4.090)***	-0.001 (-1.167)	0.0002 (3.303)***	-0.0004 (-0.469)
<i>Density</i>	-2.830 (-0.144)	-0.117 (-0.028)	-1.725 (-0.091)	1.566 (1.244)	0.823 (0.042)
<i>Income</i>	-0.004 (-0.318)	0.003 (1.172)	-0.009 (-0.714)	0.0004 (0.464)	-0.004 (-0.330)
<i>Left</i>	1,898.882 (0.440)	461.790 (0.499)	1,498.223 (0.359)	-147.142 (-0.530)	2,308.576 (0.534)
<i>Weak Govt.</i>	-2,025.767 (-0.563)	742.322 (0.958)	-3,061.558 (-0.872)	-428.490 (-1.850)*	-1,960.22 (-0.541)
<i>T₉₅</i>	4,401.866 (1.937)*	2,958.053 (5.942)***	1,426.904 (0.647)	88.427 (0.606)	4,368.680 (1.919)*
<i>T₉₆</i>	1,128.855 (0.423)	3,692.163 (6.187)***	-2,318.126 (-0.899)	833.446 (4.885)***	611.189 (0.229)
<i>T₉₇</i>	6,048.027 (1.766)*	5,976.819 (7.777)***	652.691 (0.196)	1,397.127 (6.371)***	5,243.094 (1.523)
<i>T₉₈</i>	10,347.334 (1.784)*	8,964.750 (6.898)***	2,542.585 (0.450)	2,191.498 (5.945)***	9,062.656 (1.555)
<i>T₉₉</i>	17,144.524 (5.515)***	11,091.342 (8.739)***	7,083.028 (1.499)	2,395.038 (7.561)***	15,896.41 (3.256)***
<i>Endogenous variable (-1)</i>	0.100 (2.023)**	0.052 (0.648)	0.114 (2.428)***	0.283 (4.297)***	0.109 (2.207)**
<i>Adj.-R²</i>	0.268	0.105	0.265	0.545	0.264

Note: *: 90% significant; **: 95% significant; ***: 99% significant

Finally, in Table 8 (short run responses) and Table 9 (long run responses), from the results presented in the previous tables, we show the adjustment process after an adverse shock of 1 pta. in tax capacity. Apart from the basic case, we have differentiated between a positive vs. a negative shock, weak vs. strong governments, election vs. non-election year, and right-wing vs. left-wing governments' responses. The most sluggish adjustment occurs in the case of tax effort, which implies that it takes about four years

to achieve the desired level of tax effort after the shock. As can be seen in Table 9, the description of the process of adjustment loses precision in the long run, which might be due to the short period covered by our panel, and to the long run adjustment of other budgetary variables not taken into account in our empirical analysis.

TABLE 8: SHORT RUN RESPONSES TO A DECREASE IN TAX CAPACITY

	$\nabla(\text{Current Expenditure})$	$\nabla(\text{Capital Expenditure})$	$\nabla(\text{Tax Capacity})$	$\Delta(\text{Tax Effort})$	$\Delta(\text{Deficit})$
Basic case	-0.070	-0.221	-1	0.244 ^{***}	+0.401
	-0.342			-0.355	
Shock (+)	+0.047	+0.165	+1	-0.243 ^{***}	-0.439
	0.273			0.318	
Shock (-)	-0.036	-0.141	-1	0.243 ^{***}	+0.452
	-0.244			-0.305	
Strong Govt.	-0.190 ^{***}	-0.575 [*]	-1	+0.233 ^{***}	-0.075
	-0.807 ^{***}			-0.842	
Weak Govt.	-0.016	-0.059	-1	+0.249 ^{***}	+0.622 ^{**}
	-0.133			-0.129	
Election Year	-0.105	-0.541 [*]	-1	+0.244 ^{***}	+0.052
	-0.709 ^{***}			-0.704	
No Elect. Year	-0.058	-0.110	-1	+0.244 ^{***}	+0.520 [*]
	-0.222			-0.236	
Right	-0.054	-0.385	-1	+0.182 ^{***}	+0.383
	-0.475			-0.435	
Left	-0.083	-0.064	-1	+0.301 ^{***}	+0.418
	-0.215			-0.281	

TABLE 9: LONG RUN RESPONSES TO A DECREASE IN TAX CAPACITY

	$\nabla(\text{Current Expenditure})$	$\nabla(\text{Capital Expenditure})$	$\nabla(\text{Tax Capacity})$	$\Delta(\text{Tax Effort})$	$\Delta(\text{Deficit})$
Basic case	-0.074	-0.248	-1	+0.367 ^{***}	+0.449
	-0.380			-0.134	
Shock (+)	+0.050	+0.187	+1	-0.359 ^{***}	-0.493
	0.304			0.148	
Shock (-)	-0.038	-0.160	-1	+0.359 ^{***}	+0.508
	-0.272			-0.133	
Strong Govt.	-0.197 ^{***}	-0.650 [*]	-1	+0.342 ^{***}	+0.085
	-0.898 ^{***}			-0.573	
Weak Govt.	-0.017	-0.067	-1	+0.366 ^{***}	+0.702 ^{**}
	-0.148			0.068	
Election Year	-0.116	-0.613 [*]	-1	+0.354 ^{***}	+0.059
	-0.807 ^{***}			-0.587	
No Elect. Year	-0.064	-0.125	-1	+0.354 ^{***}	+0.590 [*]
	-0.253			-0.056	
Right	-0.057	-0.433	-1	+0.250 ^{***}	+0.429
	-0.526			-0.321	
Left	-0.088	-0.072	-1	+0.414 ^{***}	+0.469
	-0.238			-0.117	

4. Conclusions

In this paper, we have characterized the process of fiscal adjustment of a representative group of municipalities of the province of Barcelona after a shock in their level of (potential) tax revenues, i.e. tax capacity. However, we have not been able to obtain an average behavior, as the process of adjustment is very much influenced by the political context within each municipality.

On the one hand, those governments qualified as "weak" in the sense that they do not have a majority of seats in the parliament of their city council thus tend to delay the unavoidable fiscal adjustment (so increasing their level of debt). On the other hand, leftist governments tend to react more strongly through increases in the level of tax effort than rightist governments, which instead tend to reduce to a greater extent the level of expenditure, mainly capital expenditure. We have also found an asymmetrical reaction to a negative and a positive shock in tax capacity in the case of tax effort. In absolute values, the reaction is relatively lower when the municipality suffers a positive shock in tax capacity, i.e. local governments are relatively reluctant to decrease taxes. Finally, adopting a dynamic empirical analysis has permitted us to identify an especially slow adjustment for the variable "tax effort", as it takes about four years to attain the desired long run level.

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