

STABILIZING THE ECONOMY IN A MULTILEVEL GOVERNMENT: THE ROLE OF SPANISH REGIONAL GOVERNMENTS

JUAN E. CASTAÑEDA

Institute of International Monetary Research and University of Buckingham

ANA HERRERO-ALCALDE

Universidad Nacional de Educación a Distancia

JOSÉ MANUEL TRÁNCHEZ-MARTÍN

Universidad Nacional de Educación a Distancia

JORDI VILA-VILA

Ayuntamiento de Alzira

Decentralization processes have taken place all over the world in the last few decades. This has led to an increasing macroeconomic impact of sub-central government budgets. Normative literature on the role of sub-central governments on the implementation of stabilization policies is abundant. However, there is still little empirical evidence addressing the bias of sub-central budgets regarding the macroeconomic performance in their territories. Using a fiscal reaction function, a pool of data covering all the regional governments in Spain, and after adjusting the regional budget balance for inertia and the business cycle, we find empirical evidence of the countercyclical bias of Spanish regional governments' fiscal policies during the period 1984-2014. This is in sharp contrast with the scarce previous literature on this field.

Key words: pro-cyclicality, fiscal reaction functions, fiscal rules, multilevel government finance.

JEL classification: E62, E63, H62, H63, H72.

Decentralization processes have taken place all over the world in the last few decades [Shah (2007), Ter-Minassian (1997), Martínez-Vázquez and Vailancourt (2011)]. Sub-central governments have become increasingly relevant both in the provision of public services and in the collection of taxes. In that context, the larger role of regional and local authorities in the design and implementation of public policies results in a greater impact of sub-central bud-

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gets on the macroeconomic performance of the economy as a whole. There is a large body of normative literature that studies the roles and scope of sub-central administrations as regards stabilization policies, which in most cases advocates for granting a preeminent role to central government's policies [Musgrave (1959), Oates (1972), King (1984)]. However, as it has already been highlighted in Rodden and Wibbels (2010), much less attention has been paid to measuring the macroeconomic impact of sub-central budget performance. Nevertheless, the overriding conclusion is that, within the widely accepted prescriptions of the classical theory of fiscal federalism regarding the vertical distribution of spending and taxing powers, regions and municipalities tend to have pro-cyclical budgets, and therefore tend to amplify the effects of the business cycle [Inman (2009), Ter-Minassian and Fedelino (2009), Abbott and Jones (2011 and 2012)].

The purpose of this paper is to contribute to the latter body of literature by assessing the bias and the scope of fiscal policies implemented by regional governments in Spain, from 1984 to 2014. More specifically, the objective is to assess whether there have been stabilizing policies at the regional level that have smoothed the business cycle or not. The Spanish case is an illustrating example to analyze the effects of decentralization on macroeconomic stability: around one third of total public spending has been transferred to the regional governments during the last thirty years, and therefore, their macroeconomic impact is quite large today. Spain stands as a quite successful experience of fast decentralization, with no service interruptions and significant overlaps as a result of the larger role increasingly played by regional governments. However, although the Spanish is a particularly relevant example of the effects of transferring larger spending and taxing powers to sub-central governments, there is a remarkable lack of empirical literature on the effects of that process on macroeconomic stabilization.

For that purpose, fiscal reaction functions will be estimated to test for the role played by regional output gaps and other institutional variables in the explanation of the evolution of the cyclically-adjusted regional budget balances in Spain from 1984 to 2014. This will allow us to assess the fiscal stance of Spanish regional governments, both during the last business cycle prior to the outbreak of the Global Financial Crisis (GFC), and within the crises periods suffered since 2008. Within this approach, and in sharp contrast with the scarce empirical literature on the topic, we find no evidence of pro-cyclical regional budgets during the last thirty years whatsoever. Even more, depending on the specification of alternative regional fiscal rules (see sections 4 and 5 below), our results suggest either anti-cyclical or neutral regional fiscal policies.

The structure of the paper is as follows. Section one will briefly review the fiscal federalism literature on stabilization policies. A descriptive analysis on the evolution of the Spanish regional budgets during the period under study will follow in section two. The empirical analysis conducted in our research and its results will be shown in sections three and four respectively. Section five summarizes and concludes.

1. THE DECENTRALIZATION OF STABILIZATION POLICIES: LITERATURE REVIEW

The classical model of normative fiscal federalism, based on Musgrave (1959), Oates (1972) and Tiebout (1956), suggests a larger effectiveness of centralized stabilization policies due to a set of factors. First and foremost, regional or local economies are wide open and interconnected with other regions, in the sense that most goods and

services that are consumed within their boundaries have been produced in other regions or municipalities. As a consequence, a sub-central anti-cyclical measure will most likely spill over the neighboring jurisdictions, thus reducing the size of the internal fiscal multipliers of public spending. This loss of effectiveness from a regional perspective could be even larger if other territories implement stabilization policies of the opposite sign, affecting the internal aggregate demand in the reverse direction. It is straightforward that these effects will be larger the smaller the size of jurisdictions, and the bigger the mobility of factors within the economy.

This argument is fostered by the consideration of economic growth and inflation rates as public goods [King (1984)]. In a context of decentralized stabilization policies in which sub-central authorities have monetary powers, they could have incentives to over-expand the money supply in order to increase their demand (if only temporarily) of goods and services produced out of their boundaries, acting as free-riders of other regions' stabilization policies.

Furthermore, if stabilization policies are driven by sub-central authorities, allowing them to borrow, a 'common pool problem' may arise when they implement unsustainable budget policies over the long term, increasing the likelihood of bail-outs by the central government in the future [Inman and Rubinfeld (2001), Dafflon (2006)]¹.

However, more recent literature [Shah (2006), Boadway and Shah (2009)] has highlighted the advantages of running a decentralized stabilization policy. The existence of a multilevel government compels policy makers to foster clarity and transparency in the design of the institutional architecture, which results in a more sound fiscal performance. In a nutshell, due to a larger level of accountability than in a purely centralized political structure, decentralization could be associated with better macroeconomic stability. Qiang and Roland (1998) suggest that fiscal competition among sub-national governments, in a context of high factors' mobility, increases the opportunity costs of a bail-out, and therefore minimizes the common pool problem mentioned above.

On the other hand, the effectiveness of purely central stabilization policies is controversial itself, since national economies have become increasingly open in the last century, thus reducing the size and impact of the domestic fiscal multipliers [Gramlich (1987)]. Furthermore, Inman and Rubinfeld (2001) highlight that labor mobility is lower than that predicted by the advocates of the classical model of fiscal federalism. Therefore, local or regional fiscal multipliers are not affected so much by mobility, leaving more room for a sub-central stabilization policy².

Be as it may, given the size of regional governments in most decentralized countries, sub-central budgets do have an impact on macroeconomic outcomes [Krol and Svorny (2007) and Levinson (1998)]. This should obviously be considered when designing and implementing stabilization programs [Dafflon (2006)]. Regarding the literature on the topic, Strazicich (1997) finds that taxes have counter-cyclical effects at the Provincial level in Canada, but this does not happen at the State level in the US. Analyzing sub-central governments' fiscal policies biases, Sørensen *et al.* (2001) and

(1) Sanguinetti and Tommasi (2004) highlight that the incentives to play in a non-cooperative way are bigger the larger the number of units involved in the game.

(2) On the contrary, Suárez-Serrato and Wingender (2014) find that regional spillovers are significant due to the high degree of openness of regional economies as well as the mobility of factors.

Rodden and Wibbels (2010) find that sub-central budgets have pro-cyclical behavior, with very sensitive tax revenue, while spending and transfers are either a-cyclical or weakly pro-cyclical³. Craig and Hoang (2011) also highlight that sub-central budgets react very slowly to changes in the business cycle. Rodden and Wibbels (2010) and Sturzenegger and Werneck (2006) show some evidence of the “voracity hypothesis”: pro-cyclicality of budgets is larger during booms than during downturns, because political agents tend not to content the expansion of budgets when resources are increasing fast, while they refrain themselves from cutting spending when revenues decrease; showing an asymmetrical behavior of policy-makers along the cycle.

As regards the size of regional and local fiscal multipliers, the empirical evidence is mixed. Suárez-Serrato and Wingender (2014) find average multipliers of 1.57, although they also show that those tend to be larger in the least developed territories. On the contrary, Clemens and Miran (2012) suggest that the size of local multipliers becomes much smaller (below unity) when windfall financing is not included in the estimations. Chodorow-Reich *et al* (2012) and Suárez-Serrato and Wingender (2014) estimate the cost of fiscal-expansion-led job creation. The former show that an increase of 100.000 US Dollars in federal aid to regional budgets translates into 3.8 job-years (3.2 non-public ones), while the latter estimate the cost of one job resulting from an expansionary fiscal policy in 30.000 US Dollars.

In any case, fiscal multipliers are the result of the budgetary activity of the public sector as a whole, and for that reason intergovernmental coordination becomes essential for the framing of a coherent set of policies aiming at achieving macroeconomic stability [Inman and Rubinfeld (2001)]. If sub-central governments tend to have pro-cyclical budgets, then federal (or central government) stabilization policies should take into account not only the evolution of the business cycle, but also that of the sub-central budgets.

This paper contributes to the empirical literature which measures and analyses changes in regional budget balances according to the evolution of the business cycle. For that purpose, the determinants of the Spanish regional budgets will be analyzed, showing empirical evidence that suggests that Spanish Autonomous Communities (hereafter, ACs) have followed a counter-cyclical behavior during both booms and downturns periods in the economy from 1984 up to 2014.

2. THE SPANISH REGIONAL BUDGET BALANCES

Although different measures can be used to study the bias (and the scope) of stabilization policies⁴, the budget balance is the most used indicator in this regard. However, it is important to acknowledge that the concept and measurement of the budget balance is subject to different definitions and interpretations. Depending on the categories of expenditure and resources included, the sign and the size of the budget balance will offer quite different information.

(3) Similar conclusions have been found for the public sector as a whole in developing countries in Vegh and Vuletin (2015), while acyclicity or countercyclicity is prevalent in industrial countries. More specifically, they find that the design of institutions and the integration with capital markets are critical in explaining those differences.

(4) Such as the ones based on the evolution of the tax burden or tax rates [Vegh and Vuletin (2015)].

Several indicators will be used to assess the fiscal stance of regional governments. First, regional net borrowing/lending or the ‘non-financial budget balance’ consists of the difference between non-financial revenues and non-financial expenditures; therefore, both current and capital spending and revenues are included in this indicator. Second, the ‘primary budget balance’ is the net borrowing/lending of the region diminished by debt interest payments. Because the latter are, to a great extent, pre-determined by budget policies in the past, primary budget balances better reflect the bias of current fiscal policies. And third, the indicators above can also be adjusted for the economic cycle, in order to assess the amount of the budget balance that is not due to the effects of the business cycle.

In this paper, Spanish regional governments (ACs) will be studied, excluding regional public corporations due to the large difficulties in incorporating them to the official statistics. Regional budget balances of the ACs have been obtained from the regional final budgets published by the Spanish Ministry of Treasury⁵.

The period of analysis goes from 1984 to 2014, which covers a full business cycle prior to the outbreak of the Global Financial Crisis in 2008 and the subsequent Eurozone crisis, as well as the years affected by those crises immediately after. This time span allows us for the assessment of regional fiscal policies during both economic booms and downturns. In addition, this period coincides with the bulk of the Spanish decentralization process that started in the early eighties and finished in 2001.

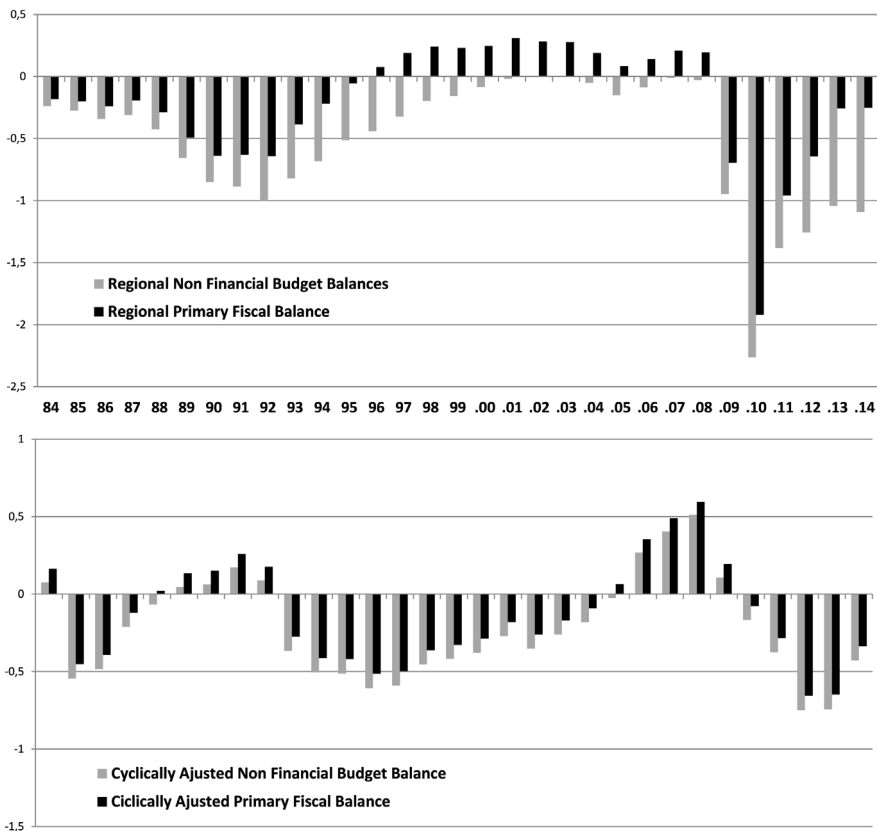
Estimating the cyclically-adjusted (or cyclically-neutral) budget balances (thus CNBB_t, see equation 1 below) requires choosing the best way to measure the balance with the economy running at its potential level of output. We use the IMF methodology in our paper, and thus assess the balance that would have occurred if the ratios of taxes and expenditures over GDP had remained constant with regards to the base year (t_0). Therefore, if taxes (T) and expenditures (E) have unitary elasticities, budget balances will be cyclically-neutral when taxes evolve according to current income growth and expenditures grow at a rate according to the rate of growth of potential income:

$$CNBB_t = T_0 \frac{GDP_t}{GDP_0} - E_0 \frac{GDP_t^*}{GDP_0^*} \quad [1]$$

Figure 1 (and tables 1 through 4 in the Appendix) shows that significant differences emerge when studying the bias and scope of Spanish regional budgets, depending on the indicator used. Even though the figures differ, the trends in both the cyclically-adjusted primary and non-financial budget balances on the one hand, and those of the non-cyclically adjusted balances on the other, are quite similar. As a distinctive feature, in quite many cases, from approximately 1996 to 2008, the non-cyclically adjusted non-financial budget deficits turn into surpluses if measured as primary budget balances, which corresponds to a period mainly driven by fiscal consolidation in the Spanish economy.

(5) Therefore, they may not necessarily coincide with the National Accounts used to monitor the fulfillment of the EU Excessive Deficit Protocol requirements, or even with those published by the Bank of Spain. They have the comparative advantage of being available from 1984, while the EU measures are only available from 1995, and only nationwide and thus for the public administration as a whole.

Figure 1: REGIONAL NON-FINANCIAL BUDGET BALANCE AND PRIMARY FISCAL BALANCE AND CYCLICALLY-ADJUSTED BALANCES (% GDP)



Source: Own elaboration, based on data from (definitive) regional budgets (www.minhap.gob.es) and Regional Accounting (see www.ine.es).

3. METHODOLOGY

The literature on fiscal reaction functions (FRFs) is quite ample [see Turrini (2008)]. Following into the footsteps of the monetary reaction functions, FRFs have been used either to prescribe or to assess the performance of governments' fiscal policies.

As prescriptive tools, most rules determine the (optimal) stance of fiscal policy according to changes in output along the cycle, as well as the fulfillment of a set of macroeconomic or/and financial pre-specified targets (such as unemployment or inflation rates, public debt ratios, etc.). Given the changes in output along the business cycle and the deviations of the chosen indicators from their targets, FRFs will automatically determine the changes in public spending and revenues that will be needed to achieve those targets.

On the other hand, FRFs can also be used from a positive perspective, as instruments that detect and measure (ex post) the fiscal policy bias of a government. Galf *et al* (2003) and Turrini (2008) have followed this approach to assess the fiscal performance at both the EU and the national level, while Castañeda (2009) applied a Taylor-like fiscal reaction function to assess that of the Spanish public sector as a whole up to 2008. More recently, Olivella (2013) and Díaz-Roldán (2016) have also followed this approach to assess the fiscal bias of regional governments in Spain.

Within the latter perspective, this paper measures the Spanish regional governments' fiscal policy bias from 1984 to 2014. A regional fiscal policy with stabilization purposes would determine the regional budget balance in year t (see BB_t , equations 2, 3, 4 below) according to the long term budget balance target (BB^*), the size of the output gap in the previous year ($Ogap_{t-1}$), the deviations from the inflation target ($\Pi_{t-1} - \Pi^*$), and the deviations from the debt target ($D_{t-1} - D^*$). Coefficient “ a_t ” in equation [2] below would therefore provide a proxy of the regional budget deviation from the long term budget balanced target:

$$BB_t = [BB^* + a_t] + b_1(Ogap_{t-1}) + b_2(\pi_{t-1} - \pi^*) + b_3(D_{t-1} - D^*) \quad [2]$$

To account for the strong inertia of public budgets and to acknowledge the fact that changes in fiscal policy should be adopted gradually, two different specifications of this equation can be made:

First, if the equation is expressed in levels, a smoothing parameter (ρ) can be included to make gradual changes in fiscal policies (equations 3 and 3bis below):

$$BB_t = \rho BB_{t-1} + (1 - \rho)(BB^* + a_t) + b_1(Ogap_t) + b_2(\pi_{t-1} - \pi^*) + b_3(D_{t-1} - D^*) \quad [3]$$

$$BB_t = \rho BB_{t-1} + (BB^* + a) + b_1(Ogap_t) + b_2(\pi_{t-1} - \pi^*) + b_3(D_{t-1} - D^*) \quad [3bis]$$

Second, in order to focus just on the changes (and not on the levels) made to fiscal policy in the current year, equation [2] can be transformed and estimated in first differences as follows (see equation 4 below):

$$(BB_t - BB_{t-1}) = a + b_1(Ogap_{t-1} - Ogap_{t-2}) + b_2(\pi_{t-1} - \pi_{t-2}) + b_3(D_{t-1} - D_{t-2}) \quad [4]$$

Where $a = a_t - a_{t-1}$

Regarding the sign of the parameters, a regional government committed to stabilizing the business cycle would expect an increase in the output gap estimates (i.e. more spare capacity) to be followed by an expansionary fiscal policy (either a higher deficit or a smaller surplus), which corresponds to a positive $b1$ parameter. A similar rationale can be applied to interpret the sign of the other estimates: inflation stabilization would require an increase in inflation over the inflation target to be followed by a less expansionary fiscal policy, and thus a positive $b2$ parameter. Finally, as regards public debt, it will only become a constraint for the regional government should an increase in indebtedness above a given target be followed by a less expansionary fiscal policy, so that we would expect a positive $b3$ parameter.

With the explanatory variables defined above, we have used a panel dataset referred to the 17 Spanish regional governments (CAs) covering from 1984 to 2014, with a total of 493 observations. FRFs will be estimated with Two-Stage Least Squares (2SLS), with the dependent variable expressed in levels (see equation [3bis] above), in order to address potential endogeneity problems that could arise when using several budgetary variables that are simultaneously determined in the political arena. As regards the estimation of equation [4], in which the dependent variable is expressed in differences, endogeneity is no longer a problem and Ordinary Least Squares (OLS) will be applied. In addition, considering the important inertia component that accompanies the budget balance over time, the assessment of the fiscal bias of a government merely based on the simple observation of its sign could be misleading. For this reason, rather than studying the relationship between the sign of the regional output gaps and the regional budget balances, we will focus on budget balance changes as a result of variations in the output gap [as previously applied in Congdon (2007) for the UK, and in Castañeda (2009) for Spain]. As a result, the “anti-cyclical fiscal policy at the margin” will be analyzed [Turrini (2008)]. Within this perspective, the dependent variable will be specified in first differences, as detailed in equation [4].

Following our discussion on the Spanish recent fiscal policy made in section 3, the dependent variable will adopt two different specifications⁶: firstly we will use the non-financial regional budget balance $-BB-$ and the primary regional budget balance $-PRIMABB-$. And, to avoid biased results due to the effects of the business cycle on public spending and revenues, we will also use the cyclically-neutral balance as the dependent variable (CNBB and CNPRIMABB), as detailed in section 3.

The selection of the indicator that captures the fiscal policy bias through a FRF ideally requires choosing an operational variable under the direct control of the fiscal authority. For this purpose, the annual regional budget balance seems to be the best indicator to use in our FRF, since both its size and changes offer a clear signal and information on the bias of fiscal policy⁷.

To estimate the FRF of the Spanish regional governments and the impact of the business cycle, the following independent variables have been considered. First of all, the constant in equations [3bis] and [4] above can be interpreted as the underlying deficit or surplus bias of the regional government, as it captures the difference between the actual budget balance (BB) and the government long term target (BB*). In addition, in order to account for the fact that budgetary variables have strong inertia, the one-period-lagged dependent variable was used as an instrument.

To capture the influence of the business cycle on the evolution of the budget balance, the output gap (*Output Gap*) has been included as an explanatory variable⁸, as

(6) Each both in levels and in differences.

(7) Alternatively, tax burden can be used, with the advantage of being susceptible of changes during the fiscal year. Fatás and Mihov (2006) and Turrini (2008) use public expenditure as their endogenous variable, while Galí *et al.* (2003) use primary balances. Nevertheless, it is important to remark that all these variables have the disadvantage of being the result of a political process, as compared to the operational variables used under monetary policy.

(8) All independent variables are expressed in levels when estimating equation [3bis] and in first differences when estimating equation [4].

measured by the application of the Hodrick-Prescott (HP) filter⁹. To check for the robustness of the results, unemployment rates (*Unemployment*) have also been used as an alternative measure of the stance of the business cycle.

Inflation has an effect on both central and regional budget balances. On the one hand, the higher the inflation rate, the higher the cost of borrowing via increases in nominal interest rates. On the other hand, higher inflation may be motivated by higher asset prices and in particular higher real estate prices (via the operation of ‘wealth effects’), so it could have a positive impact on the regional government finances with larger tax collections. Therefore, to account for the effects of inflation on the budget balance, each regional government’s inflation rates (*Inflation*) will be used as an independent variable. In addition, in line with the central government inflation target (anchored by the European Central Bank inflation target for the whole Eurozone), we will test whether deviations of inflation against the 2% nation-wide inflation target matters in the design of fiscal policies at the regional level; thus assessing whether the CAs in Spain have contributed to the achievement of the national inflation target or not.

Regional governments in Spain are allowed to borrow, although they have to fulfill several conditions for over a year maturity loans: a) the funds will only be used to pay for investment spending, and b) the total amount of the service of the debt (both capital and interest payments included) cannot exceed 25% of the annual current revenues of the regional government. Because the evolution of the regional debt will constraint the ability of ACs to borrow more, an independent variable regarding the stock of regional debt will be included (*Debt*)¹⁰.

Together with the previous independent variables, a set of control variables will also be included to account for changes in the legal or institutional framework. Firstly, a ‘dummy’ variable will capture the effect of the so-called Budgetary Consolidation Scenarios (*BCS*) implemented during the period 1992-2001¹¹. Secondly, another ‘dummy’ variable will be included to capture the effects of the Budgetary Stability Act (*BSA*) in force from 2001 through 2006. And finally, a ‘dummy’ variable to account for the special regional financial regime of the Basque Country and Navarre will be included in the estimations (*Foral*).

4. RESULTS

Table 1 below shows that in 18 out of the 30 years in our sample (1984-2014), Spanish regional governments appear to have conducted an active fiscal policy aimed at stabilizing the cycle, as indicated by the correlation between the sign of the out-

(9) This filter has been widely used in the literature: see amongst others Hernández de Cos (2001), Corrales *et al.* (2002), and Doménech and Gómez (2005) for the Spanish economy as a whole, as well as Bello (2007) for the Spanish sub-central governments. An alternative methodology to estimate potential GDP uses a Cobb-Douglas aggregate production function. However, this approach has the disadvantage of requiring a very high volume of statistical information, not always available at the regional level, such as in the case of this paper.

(10) The debt to the regional GDP ratio is only available from 1995.

(11) The BCS involved the definition of both deficit and debt ceilings for every AC, and were meant to foster regional convergence within the tasks given in the “Treaty of the European Union” [Monasterio-Escudero and Fernández-Llera (2008)].

put gap in those years and the cyclically adjusted budget balance: a negative output gap is followed by a deterioration in the budget balance (higher deficit or lower surplus as compared with the previous year), with a positive correlation coefficient (0,326). Even though subject to further analysis, this exploratory analysis suggests the running of (discretionary) fiscal policy by the regional governments in Spain as a whole with an aim at stabilizing the fluctuations of the economy along the business cycle.

Table 1: OUTPUT GAP AND CYCLICALLY ADJUSTED BALANCES IN FIRST (ANNUAL) DIFFERENCES*

	<i>Output gap</i>	<i>Cyclically adjusted budget balance</i>	<i>Cyclically adjusted primary budget balance</i>	<i>Cyclically adjusted balance in first differences</i>	<i>Cyclically adjusted primary budget balance in first differences</i>
1984	2,879	0,0739	0,1614		
1985	-3,253	-0,5436	-0,4506	-0,6175	-0,6120
1986	-2,683	-0,4830	-0,3905	0,0606	0,0601
1987	-0,039	-0,2105	-0,1205	0,2724	0,2700
1988	1,413	-0,0669	0,0218	0,1436	0,1424
1989	2,579	0,0454	0,1331	0,1123	0,1113
1990	2,758	0,0624	0,1500	0,0170	0,0169
1991	3,926	0,1720	0,2586	0,1096	0,1086
1992	3,030	0,0882	0,1755	-0,0839	-0,0831
1993	-1,564	-0,3658	-0,2744	-0,4540	-0,4499
1994	-2,896	-0,5055	-0,4129	-0,1397	-0,1384
1995	-2,960	-0,5123	-0,4196	-0,0068	-0,0068
1996	-3,840	-0,6069	-0,5133	-0,0945	-0,0937
1997	-3,679	-0,5894	-0,4960	0,0174	0,0173
1998	-2,398	-0,4529	-0,3607	0,1366	0,1353
1999	-2,075	-0,4189	-0,3271	0,0339	0,0336
2000	-1,681	-0,3780	-0,2865	0,0409	0,0406
2001	-0,628	-0,2699	-0,1793	0,1081	0,1072
2002	-1,427	-0,3517	-0,2604	-0,0818	-0,0811
2003	-0,536	-0,2606	-0,1702	0,0911	0,0902
2004	0,252	-0,1813	-0,0916	0,0793	0,0786
2005	1,853	-0,0242	0,0641	0,1571	0,1557
2006	4,974	0,2684	0,3541	0,2926	0,2900
2007	6,491	0,4044	0,4889	0,1360	0,1348
2008	7,712	0,5111	0,5946	0,1067	0,1057
2009	3,209	0,1051	0,1922	-0,4060	-0,4024
2010	0,399	-0,1668	-0,0772	-0,2718	-0,2694
2011	-1,640	-0,3737	-0,2822	-0,2069	-0,2051
2012	-5,134	-0,7491	-0,6543	-0,3754	-0,3720
2013	-5,077	-0,7427	-0,6479	0,0064	0,0064
2014	-2,158	-0,4277	-0,3357	0,3150	0,3122

(*) Years when the sign of changes in the deficit or surplus coincides with the sign of the output gap have been shaded.

4.1. Budget balance in levels

Columns 1 to 4 of Table 2 below show the results of the estimation of equation [2] (See section 4) when budget balances are not adjusted to the economic cycle. The first thing to highlight is the statistical significance of the constant term, and its negative sign, suggesting that ACs, considered as a whole, suffered from a deficit bias throughout the sample period.

Either when using unemployment or the output gap as alternative explanatory variables, the estimates of the other coefficients do not change significantly, thus suggesting their suitability to capture cyclical changes in the economy and confirming the robustness of the estimates.

The estimates of the output gap coefficients confirm the running of an intended policy to stabilize business cycle fluctuations: in particular, output gap coefficients are positive (though rather small), which indicates the running of higher deficits (or lower surplus) by ACs when the regional economy is performing below its long term, its potential output or its equilibrium rate of growth¹². In the same vein, when unemployment rates are used in the equation instead of the output gap, the estimates show a similar result: in this case, a negative unemployment coefficient indicates higher deficit (or lower surplus) when the economy is below its potential and vice versa.

Inflation rates, on the other hand, do not seem to have any explanatory power of regional budgetary figures when using non-adjusted to the cycle balances as dependent variables. As expected, a reduction in the debt position of the regional governments has a positive impact on the budget balance over the years, which corresponds to the expected positive sign of the debt coefficient.

The impact of the institutional and legal framework differs significantly when using budget balance figures or cyclically adjusted balances. If the former are used, the positive and statistically significant coefficients for both BCS and BSA dummy variables show the positive contribution of both budget sustainability strategies to the improvement of the regional budget balances.

Moving on to the estimations of equation [3bis] based on the cyclically neutral regional budget balances, columns 5 to 8 in Table 2 show quite different results. Regarding the constant term, the estimates are very close to zero and statistically insignificant, or even slightly positive. These results would suggest the running of sound fiscal policies over the long term, once the effects of changes in the business cycle to the budget balance have been discounted.

The inertia component (measured by lagged dependent variable) is larger when cyclically adjusted budget balances are considered (with coefficients higher than 0.8) than when no adjusted measures are used (0.54 and 0.48 for the non-financial and primary balance respectively). This very significant weight in the inertia component is the expected outcome resulting from the application of gradual changes in the budget along the years and the highly degree of persistence of some of the major components of regional governments' expenditures (such as health and education). The

(12) Note that the Output Gap has a negative sign when the economy is running below its potential capacity, and a positive sign when running above. Therefore, if the Output Gap is negative and its coefficient is positive, the dependent variable should have a negative sign (deficit).

Table 2: ESTIMATES OF THE FISCAL REACTION FUNCTIONS (BUDGET BALANCES IN LEVELS)

Dependent Variable	Non-financial budgetary balance / GDP (BB)		Primary budget balance / GDP (PRIMABB)		Cyclically neutral non-financial budget balance / GDP (CNBB)		Cyclically neutral primary budget balance / GDP (CNPRIMABB)	
	OGAP (1)	UNEMPLOYMENT (2)	OGAP (3)	UNEMPLOYMENT (4)	OGAP (5)	UNEMPLOYMENT (6)	OGAP (7)	UNEMPLOYMENT (8)
Cyclical position Specification								
Constant	-0.504 (0.000)	-0.482 (0.000)	-0.406 (0.000)	-0.359 (0.001)	-0.054 (0.116)	0.017 (0.631)	-0.001 (0.975)	0.057 (0.089)
Dependent variable (t-1)	0.543 (0.000)	0.548 (0.000)	0.479 (0.000)	0.482 (0.000)	0.813 (0.000)	0.878 (0.000)	0.810 (0.000)	0.875 (0.000)
Ogap	0.032 (0.000)		0.031 (0.000)		0.034 (0.000)		0.034 (0.000)	
Unemployment		-0.026 (0.005)		-0.027 (0.003)		0.044 (0.000)		-0.041 (0.000)
Inflation	0.004 (0.905)	0.010 (0.784)	0.011 (0.744)	0.005 (0.896)	0.025 (0.027)	0.008 (0.490)	0.021 (0.056)	0.003 (0.817)
Debt	0.009 (0.001)	0.009 (0.000)	0.007 (0.001)	0.007 (0.002)	0.001 (0.109)	-0.001 (0.125)	0.001 (0.079)	0.001 (0.172)
BCS	0.332 (0.01)	0.289 (0.001)	0.394 (0.000)	0.348 (0.000)	-0.037 (0.280)	-0.101 (0.001)	-0.053 (0.124)	-0.099 (0.001)
BSA	0.568 (0.000)	0.498 (0.000)	0.593 (0.000)	0.521 (0.000)	-0.017 (0.699)	0.041 (0.290)	-0.010 (0.817)	0.039 (0.285)
Foral	0.194 (0.026)	0.170 (0.045)	0.167 (0.050)	0.144 (0.085)	0.194 (0.019)	0.088 (0.002)	0.144 (0.020)	0.095 (0.000)
R ²	0.454	0.437	0.406	0.377	0.896	0.898	0.920	0.906
Sargan test	0.164	0.153	0.634	0.596	0.391	0.318	0.235	0.259
Observations	493							

P-values in parentheses.

estimates of the output gap coefficient are still positive (and quite small, 0.034), which would indicate the running of a countercyclical policy by the regional governments.

As regards inflation rate, it is not statistically significant when using unemployment rates to capture changes in the cycle. Only when output gap figures are used in its place does inflation become significant and with the expected positive sign: so that higher inflation is accompanied by a less expansionary fiscal policy (either less deficit or higher surplus).

When the cyclically adjusted balance is used as the dependent variable, debt coefficients are close to or zero, and statistically insignificant. Moreover, and contrary to the results obtained with the non-adjusted dependent variable, both BCS and BSA seem to be irrelevant in the determination of regional budget balances. Both set of results would mean that, on average, regional governments have not been constrained by their debt position or the budgetary legal framework when deciding changes to their fiscal position in the period analyzed.

Finally, the inclusion of the dummy variable regarding the special financial and tax regime of the so-called “Foral” territories (the Basque Country and Navarre) suggests that this distinctive institutional and legal arrangement had a positive contribution to the regional budget balance. We presume this could be explained due to the larger level of resources managed by those two regional governments under such regime.

An important caveat regarding the estimates of the equations with the regional budget balance in levels: we have tested for stationarity using the Augmented Dickey-Fuller (ADF) test for the individual series, and Levin, Lin and Chu test and ADF for the panel estimates, and we cannot reject stationarity. We have applied the same tests to the equations with the budget balance in differences (see section 4.2 below) and there is no presence of stationarity.

4.2. Budgetary policy at the margin

Table 3 below shows the effects of changes in the variables included in the fiscal reaction functions when the dependent variable is specified in first differences (see equation [4], section 3). First, and foremost, it can be observed that the constant term (α) is statistically irrelevant, suggesting that regional budgets would be balanced in the long term at the potential level of production.

As to the estimate of the coefficients of the variables included in the reaction function, the sign of the variations in output gap is positive, and thus a negative variation in the output gap—either larger non-used output capacity, if negative, or lower excess in output capacity, if positive—is accompanied by a deterioration in the budget balance, either by an increase in the deficit or a decrease in the surplus, as compared to the previous year. These results are confirmed by the corresponding effects of unemployment changes in the running of a counter-cyclical fiscal policy: in this case, the negative sign of the coefficient shows how an increase in unemployment rates would lead to a more expansive fiscal policy by the ACs (thus higher deficit or lower surplus). This would confirm the running of a deliberate countercyclical fiscal policy by the Spanish ACs in those years.

The other macroeconomic variables appear to be much less relevant in the explanation of regional balances: while changes in rates of inflation are not significant,

changes in borrowing are only marginally significant (at the 95% level) when unemployment is used as a proxy of the economic cycle.

Finally, out of the legal and institutional constraints regarding the fiscal position of the regional governments, only BCS is statistically significant, and only if unemployment is used to capture the cyclical stance of the economy. However, in that case, the negative sign is opposed to the one expected. Even if the coordination of the fiscal position of the different levels of government in Spain and the passing of rules committed to fiscal sustainability over the long term have had a positive impact on the budget balance, these results suggest they have not affected that much the discretionary fiscal policies developed by regional governments.

Table 3: ESTIMATES OF THE FISCAL REACTION FUNCTIONS
(DEPENDENT VARIABLE IN DIFFERENCES)

Dependent variable	Cyclical neutral budget balance		Cyclically neutral primary balance	
	OGAP (9)	UNEMPLOYMENT (10)	OGAP (11)	UNEMPLOYMENT (12)
Constant	0.003 (0.929)	0.056 (0.117)	0.004 (0.912)	0.055 (0.118)
Ogap	0.018 (0.000)		0.017 (0.000)	
Unemployment		-0.043 (0.000)		-0.042 (0.000)
Inflation	0.006 (0.625)	-0.003 (0.784)	0.005 (0.626)	-0.003 (0.772)
Debt	0.000 (0.444)	0.002 (0.031)	0.000 (0.462)	0.002 (0.029)
BCS	-0.033 (0.363)	-0.100 (0.001)	-0.031 (0.391)	-0.097 (0.001)
BSA	-0.007 (0.879)	0.017 (0.654)	-0.007 (0.810)	0.017 (0.661)
Foral	-0.006 (0.657)	-0.019 (0.390)	-0.006 (0.677)	0.018 (0.392)
R ²	0.054	0.331	0.053	0.339
Prob (F-statistic)	0,000	0,000	0,000	0,000
Observations	493			

P-values in parentheses.

5. CONCLUSIONS

The classical theory of fiscal federalism prescribes a very limited role of regional and local governments in the implementation of output stabilizing policies [Musgrave (1959), Oates (1972)]. However, more recent normative literature has highlighted the potential positive effects of sub-central stabilization policies [Shah (2006 and 2007)] on both the sustainability of public budgets and overall macroeconomic performance.

This paper contributes to the literature that aims at assessing the bias –and the size– of sub-central budget balances. Using Fiscal Reaction Functions as a tool to measure the bias of Spanish regional fiscal policy in the last business cycle, several conclusions can be highlighted. First, when analyzing budget balances in levels, it seems that there is a deficit-bias in the running of regional budgets. However, this results do not apply when adjusting the performance of regional public deficits to the economic cycle. Moreover, when fiscal policy at the margin is at stake, our results point at a balanced regional budget position along the cycle during the time period analyzed.

Our estimates confirm the expected (enormous) inertia in the Spanish regional budget policy from 1984 to 2014. Regarding the institutional variables, our results suggest a positive role of the national and supranational legal architecture as regards fiscal performance when using the budget balance without any adjustments, but that role is not so clear when using the cyclically-neutral budget balance as a dependent variable in our estimates. In addition, neither regional debt behavior nor inflation developments appear to have had a major impact in the conduction of fiscal policies by regional governments in Spain in the last business cycle.

Contrary to the usual belief that sub-central budgets tend to have a pro-cycle behavior, our estimates of the output gap and the unemployment rates as key elements of the regional fiscal reaction functions point to a counter-cyclical regional fiscal policy in Spain in the last thirty years. Consequently we can conclude that the fiscal position of the Spanish ACs has been very much affected by business cycle fluctuations (see Tables 1-4, Annex), but once the effects of the fiscal stabilizers are discounted so we can assess the deliberate fiscal policy of the Spanish regional governments, it has been, if at all, mainly countercyclical. This provides the empirical evidence that a stabilizing effect of sub-central budgets has been found, as opposed to most of the previous literature on the topic.

However the results of our analysis must be interpreted with caution. With the exception of the estimates of the cyclically-adjusted balances in levels, the degree of fitness of the other estimated fiscal reaction functions is not very high; particularly that of the equations in differences. Moreover, the estimates of the coefficients analyzed in our paper are not very high either. All in all, we can conclude that our analysis at least does reject the explanation of the fiscal position of the Spanish public sector as a result of deliberate pro-cyclical regional fiscal policies, even though we must admit output stabilization does not seem to have had such a determinant role in explaining the fiscal position of regional governments in Spain in the last business cycle. Our awareness of these caveats points at other more relevant (political) determinants of the fiscal position of the Spanish regional governments in the recent years, which are beyond the scope of our paper.

Table 1: REGIONAL NON-FINANCIAL BUDGET BALANCES (% GDP)

	Aragón	Asturias	Canarias	Cantabria	Castilla La Mancha	Cataluña	Extremadura	Galicia	Illes Balears	Madrid	Murcia	N Navarra	País Valencià	La Rioja	Total CCAA			
1984	0.40	0.89	0.02	-0.25	-0.04	0.40	0.05	0.00	-0.02	1.78	0.50	0.00	0.27	-0.07	0.34	-0.04	-0.08	-0.24
1985	-0.20	0.10	0.77	-0.61	-0.37	0.13	-0.05	-0.02	-1.41	0.85	-0.52	-0.23	0.12	-0.52	-0.29	0.19	-0.10	-0.27
1986	-0.73	0.38	-0.05	-0.79	0.10	0.46	-0.07	-0.09	-0.98	0.07	0.25	-0.49	-0.13	-0.74	-1.23	-0.18	0.71	-0.34
1987	-1.37	0.52	-0.43	0.50	0.33	-0.58	0.63	1.52	-0.29	0.47	0.22	-0.47	-0.12	-0.07	0.64	0.18	1.01	-0.31
1988	0.15	0.30	-0.07	0.47	0.00	-0.63	0.27	-0.07	-0.40	-0.42	-0.12	-0.03	-0.27	-0.06	1.43	0.73	0.28	-0.43
1989	-0.71	0.29	-0.35	0.12	0.55	-1.74	-0.07	-0.52	-0.76	0.37	-0.75	-0.35	-0.57	-0.82	0.38	-0.41	-0.12	-0.66
1990	-1.93	-0.36	-1.12	-0.89	-1.12	-2.40	-0.16	0.55	-0.43	1.11	-1.35	-0.35	-0.64	-1.21	4.58	-0.84	-1.11	-0.85
1991	-2.38	-1.20	-0.79	-1.58	-1.66	-1.99	-0.90	-0.67	-1.32	-0.97	-2.25	-0.94	-0.60	-1.02	-1.43	-0.48	-2.03	-0.89
1992	-0.81	-1.12	-0.95	-0.94	-0.42	0.36	-0.54	-0.78	-1.07	-2.40	-2.16	-0.72	-0.47	-0.60	-4.33	-0.13	-0.73	-1.00
1993	-1.23	-1.18	-0.56	-0.93	-0.95	0.24	-0.57	-0.50	-1.44	-1.03	-1.48	-0.20	-0.35	-0.43	-3.31	-0.96	-0.22	-0.82
1994	-1.21	-1.44	-0.09	-1.33	0.44	2.96	-0.35	-0.45	-0.72	-0.13	-1.26	0.14	-0.55	-0.29	-2.50	-0.51	0.08	-0.68
1995	-0.63	-0.13	0.06	-0.60	-0.86	0.86	-0.26	-0.26	-0.58	-0.03	-0.89	0.02	-0.41	-0.06	-0.40	-0.61	-0.15	-0.51
1996	-0.62	-0.61	-0.23	-1.37	-0.85	0.41	-0.17	-0.35	-0.35	-0.09	-0.61	0.16	-0.37	0.06	0.50	-0.01	0.39	-0.44
1997	-0.05	-0.25	-0.39	-0.93	-0.06	0.09	0.06	-0.11	-0.23	0.24	-0.44	-0.09	-0.12	-0.07	0.52	-0.14	0.08	-0.32
1998	-0.16	0.11	-0.66	-0.88	0.02	0.15	-0.13	-0.12	-0.10	0.41	-0.31	0.25	0.01	0.09	1.25	0.78	-0.08	-0.20
1999	0.29	0.14	-0.18	-1.08	0.34	-0.79	0.02	-0.10	0.00	0.19	-0.02	0.15	-0.02	0.02	0.31	1.23	-0.51	-0.16
2000	-0.14	-0.45	-0.33	-1.13	0.03	0.09	0.24	-0.08	0.04	-0.63	-0.01	0.05	0.04	0.00	0.60	1.20	-0.87	-0.08
2001	0.03	-0.13	-0.67	-0.62	0.01	-0.19	0.06	0.00	0.02	-0.21	-0.16	-0.44	-0.41	-0.02	-0.41	0.86	-0.43	-0.02
2002	0.03	-0.60	-0.63	-0.26	0.06	-0.19	0.08	-1.21	0.04	-0.67	0.23	-0.65	0.14	0.00	0.53	0.71	0.22	0.00
2003	0.40	-0.08	0.40	-0.54	0.03	0.51	0.05	0.04	0.20	0.51	0.07	-0.09	0.17	0.04	0.01	0.11	-0.40	0.00
2004	0.46	-0.39	0.23	-0.29	-0.42	0.24	0.21	-0.90	-0.37	0.56	0.42	2.10	0.33	0.24	-0.64	0.41	-0.23	-0.05
2005	0.33	-0.04	0.51	0.24	0.28	0.61	-0.31	-0.53	-0.34	1.68	0.03	-1.56	0.30	1.04	0.66	0.96	-0.38	-0.15
2006	1.08	0.11	0.32	0.77	0.32	-0.29	-0.19	-0.39	-0.05	0.58	0.17	0.11	0.46	0.88	1.66	1.28	-0.52	-0.09
2007	0.69	0.07	0.12	0.63	0.32	-0.04	0.37	0.30	-0.25	0.72	0.44	-1.02	0.48	0.20	1.16	1.25	-0.93	-0.01
2008	-0.79	-0.75	-0.25	-0.34	-0.80	-0.65	-0.37	-1.67	-1.49	-1.18	0.35	-2.61	-0.39	-2.49	-1.73	-0.88	-1.19	-0.03
2009	-1.32	-1.54	-0.87	-1.61	-1.25	-1.12	-1.16	-3.78	-2.46	-1.41	-0.59	-2.80	-0.56	-0.60	-1.92	-3.86	-0.91	-0.95
2010	-2.11	-2.22	-1.71	-2.71	-1.63	-3.24	-2.46	-4.63	-2.58	-1.99	-1.69	-3.62	-0.87	-3.60	-2.11	-2.33	-2.84	-2.26
2011	-2.01	-2.50	-2.37	-3.26	-1.06	-2.17	-1.27	-8.74	-3.36	-4.01	-1.24	-2.85	-0.16	-3.30	-1.76	-1.83	-0.91	-1.38
2012	-3.61	-1.95	-2.27	-4.46	-1.84	-3.85	-3.06	-2.84	-1.81	-2.94	-1.62	-3.84	-1.55	-5.29	-1.76	-1.19	-1.78	-1.04
2013	-2.12	-1.37	-0.94	-3.05	-1.44	-1.21	-1.09	-1.83	-1.62	-1.01	-0.99	-1.38	-0.28	-2.49	-1.23	-0.95	-1.78	-1.26
2014	-1.28	-1.16	-1.11	-3.60	-1.46	-1.52	-1.17	-1.73	-2.04	-2.98	-1.18	-1.65	-0.84	-2.69	-0.59	-0.88	-1.46	-1.09
Average	-0.70	-0.55	-0.46	-1.01	-0.43	-0.49	-0.40	-0.97	-0.84	-0.42	-0.57	-0.75	-0.22	-0.77	-0.35	-0.21	-0.52	-0.53
Average	-0.35	-0.23	-0.19	-0.51	-0.16	-0.06	-0.08	-0.20	-0.45	0.10	-0.42	-0.19	-0.11	-0.14	0.01	0.23	-0.25	-0.36
Average	-1.89	-1.84	-1.36	-2.72	-1.36	-1.97	-1.51	-3.62	-2.20	-2.22	-1.09	-2.68	-0.59	-2.95	-1.59	-1.70	-1.45	-1.14

Table 2: REGIONAL PRIMARY FISCAL BALANCE (% GDP)

	Aragón	Asturias	Comunidad Valenciana	Cantabria	Castilla y León	Castilla-La Mancha	Cataluña	Extremadura	Galicia	Illes Balears	Madrid	Murcia	Navarra	País Valencià	La Rioja	Total CCAA
1984	0.33	0.10	-0.25	-0.04	0.52	0.05	0.13	1.78	0.52	0.02	0.31	0.06	0.72	0.09	0.02	-0.18
1985	-0.16	0.12	0.83	-0.59	0.31	-0.03	0.01	-1.20	-0.50	-0.19	0.16	-0.34	-0.14	0.34	0.00	-0.20
1986	-0.66	0.41	0.06	-0.75	0.24	-0.05	-0.06	0.09	0.30	-0.44	-0.10	-0.60	-1.12	-0.18	0.81	-0.24
1987	-1.30	0.56	0.56	0.51	-0.34	0.67	1.55	0.04	0.27	-0.43	-0.09	0.12	0.72	0.38	1.01	-0.19
1988	0.24	0.32	0.02	0.55	0.16	-0.34	-0.04	-1.12	-0.38	-0.07	0.01	-0.19	1.49	0.92	0.34	-0.29
1989	-0.56	0.34	-0.24	0.22	0.69	-1.33	-0.04	-0.44	-0.40	-0.71	-0.31	-0.43	0.41	-0.19	-0.03	-0.49
1990	-1.63	-0.31	-0.57	-0.76	-0.96	-1.58	-0.12	1.16	-1.22	-0.28	-0.45	-0.84	4.59	-0.58	-0.93	-0.64
1991	-1.92	-1.14	-1.39	-1.49	-0.96	-0.82	-0.59	-0.86	-1.90	-0.76	-0.38	-0.54	-1.42	-0.15	-1.62	-0.63
1992	-0.20	-0.96	-0.60	-0.38	1.12	-0.40	-0.67	-2.14	-1.51	-0.45	-0.20	-0.06	-4.29	0.26	-0.17	-0.64
1993	-0.49	-0.83	-0.18	-0.62	1.06	-0.34	-0.30	-0.85	-0.83	0.14	-0.02	0.11	-2.84	-0.07	0.32	-0.38
1994	-0.56	-1.09	-0.94	-0.77	3.47	-0.13	-0.25	0.29	-0.53	0.38	-0.23	0.28	-1.90	0.07	0.45	-0.22
1995	0.06	0.26	0.38	-0.01	-0.49	1.31	-0.01	0.04	-0.09	0.28	-0.05	0.46	0.34	0.01	0.22	-0.05
1996	0.13	-0.18	0.07	-0.89	-0.52	0.76	0.06	-0.14	0.33	0.42	-0.02	0.55	1.53	0.57	0.72	0.08
1997	0.64	0.05	-0.49	0.21	0.27	0.27	0.08	0.37	0.67	0.27	0.11	0.22	1.39	0.36	0.30	0.19
1998	0.46	0.36	-0.45	-0.42	0.24	0.37	0.06	0.45	0.77	0.32	0.44	0.25	2.05	1.20	0.02	0.24
1999	0.82	0.34	0.02	-0.73	0.49	-0.41	0.18	0.45	0.48	0.55	0.26	0.18	0.25	0.94	1.55	0.23
2000	0.40	-0.22	-0.14	-0.77	0.16	0.54	0.39	-0.36	0.52	0.15	0.21	0.17	1.12	1.45	-0.77	0.25
2001	0.51	0.10	-0.46	-0.17	0.15	0.30	0.21	0.14	0.34	0.09	-0.34	0.17	0.01	0.86	-0.29	0.31
2002	0.47	-0.40	0.41	0.11	0.18	-0.06	0.20	-1.09	0.34	-0.42	0.30	0.17	0.90	0.84	0.34	0.28
2003	0.81	0.10	0.61	-0.23	0.13	0.62	0.16	0.46	0.75	0.43	0.04	0.36	0.19	0.36	0.26	0.28
2004	0.80	-0.20	0.40	0.00	-0.30	0.35	0.32	-0.77	0.76	0.70	0.47	0.38	-0.31	0.55	-0.15	0.19
2005	0.63	0.14	0.67	0.54	0.39	0.70	-0.22	-0.40	0.28	-1.41	0.43	1.15	1.16	1.07	-0.30	0.08
2006	1.34	0.27	0.46	1.14	0.44	-0.19	-0.07	-0.26	0.76	0.43	0.29	0.89	1.88	1.35	-0.43	0.14
2007	0.93	0.23	0.25	0.96	0.44	0.06	0.28	0.91	0.70	-0.84	0.60	0.31	1.34	1.29	-0.77	0.21
2008	-0.57	-0.58	-0.12	-0.02	-0.67	-0.54	-0.25	-1.47	-1.15	-0.99	-0.12	-2.35	-2.27	-3.82	-0.85	-1.01
2009	-1.07	-1.32	-1.12	-1.07	-1.03	-3.55	-2.07	-1.23	-0.40	-2.51	-0.23	-0.46	-1.73	-3.82	-0.74	-0.69
2010	-1.82	-2.00	-1.57	-2.24	-1.39	-3.11	-2.27	-4.34	-2.12	-1.47	-3.30	-0.42	-3.42	-2.20	-2.71	-1.92
2011	-1.61	-2.17	-2.09	-2.64	-0.74	-1.85	-0.98	-8.19	-2.63	-0.86	-2.39	0.04	-2.96	-1.45	-1.59	-0.96
2012	-3.07	-1.49	-1.84	-3.48	-1.45	-3.21	-2.60	-2.03	-1.15	-2.95	-1.24	-4.67	-1.24	-0.88	-1.42	-0.64
2013	-1.44	-0.79	-0.40	-1.84	-0.93	-0.44	-0.50	-0.71	-0.73	-0.35	-0.44	-0.49	-1.62	-0.63	-0.60	-0.26
2014	-0.60	-0.52	-2.36	-0.91	-0.86	-0.51	-1.08	-2.34	-0.51	-0.76	-0.37	-1.79	0.00	-0.49	-1.06	-0.25
Average	-0.29	-0.33	-0.24	-0.61	-0.23	-0.12	-0.23	-0.40	-0.16	-0.19	-0.52	-0.45	0.01	0.05	-0.32	-0.20
Average	0.05	0.00	-0.22	0.00	0.30	0.04	-0.08	-0.07	0.33	-0.04	0.07	0.14	0.37	0.49	-0.07	-0.07
Average	-1.46	-1.27	-1.04	-1.96	-1.02	-1.58	-1.16	-2.96	-1.81	-0.70	-2.11	-2.47	-1.21	-1.49	-1.16	-0.65

Table 3: REGIONAL CYCLICALLY ADJUSTED NON-FINANCIAL BUDGET BALANCE (% GDP)

	Andalucía	Aragón	Asturias	Cantabria	Castilla La Mancha	Castilla y León	Cataluña	Extremadura	Galicia	Illes Balears	Madrid	Murcia	Narvaya	Extremadura	La Rioja	Total CCAA
1984	-0.48	0.02	-0.14	-0.44	-0.16	-0.50	-0.32	0.14	-0.77	0.05	-0.34	0.04	-0.07	-0.23	-0.40	0.07
1985	-0.55	-0.28	0.04	-1.46	-0.31	-0.47	-0.05	0.86	-1.09	0.20	-0.52	-0.05	-0.57	-0.49	-0.55	-0.54
1986	-0.53	-0.18	0.21	-0.37	-0.73	-0.43	-0.45	-0.17	-1.37	0.11	-0.34	0.19	-0.48	-0.37	-0.82	-0.48
1987	0.20	-0.07	0.16	-0.08	-0.08	-0.18	0.12	0.32	-1.05	0.19	-0.25	0.23	0.71	-0.48	-0.68	-0.21
1988	0.53	0.14	0.21	-0.05	0.45	-0.16	0.47	0.66	-0.72	0.22	-0.31	0.18	0.54	-0.49	-0.48	-0.07
1989	0.27	0.23	0.28	0.08	-0.02	1.12	0.14	0.67	-0.52	0.16	-0.29	0.21	1.50	0.02	-0.34	0.05
1990	0.74	0.18	0.22	0.31	-0.15	1.08	0.21	0.71	-0.48	0.21	-0.23	0.35	0.94	0.09	-0.12	0.06
1991	0.93	0.19	0.22	0.39	-0.14	1.04	0.16	0.81	-0.33	0.27	-0.22	0.31	1.00	0.25	0.03	0.17
1992	0.60	0.12	0.27	0.23	0.23	0.01	1.04	0.78	-0.31	0.27	-0.26	0.26	0.86	0.03	0.06	0.09
1993	-0.33	-0.09	0.04	-0.28	-0.23	0.88	-0.31	0.88	-0.31	0.04	-0.40	0.08	-0.33	-0.53	-0.12	-0.37
1994	-0.48	-0.15	0.01	-0.46	-0.63	0.87	-0.47	0.28	-1.25	0.08	-0.44	0.03	-0.48	-0.65	-0.11	-0.51
1995	-0.63	-0.13	0.06	-0.60	-0.86	0.86	-0.26	-0.58	-0.89	0.02	-0.41	-0.06	-0.40	-0.61	-0.15	-0.51
1996	-0.79	-0.18	-0.02	-0.72	-1.04	0.79	-0.41	-0.32	-0.60	-0.16	-1.22	-0.02	-0.45	-0.85	-0.24	-0.61
1997	-0.68	-0.10	-0.09	-1.08	-0.57	-1.08	0.79	-0.50	-1.26	0.06	-0.45	-0.01	-0.22	-0.74	-0.17	-0.59
1998	-0.57	-0.10	0.03	-0.33	-0.84	0.86	-0.45	-0.02	-0.54	0.12	-0.36	0.06	0.00	-0.47	-0.11	-0.45
1999	-0.58	-0.19	-0.08	-0.30	-0.88	-0.45	-0.21	0.46	-1.22	0.20	-0.35	0.03	-0.02	-0.29	-0.14	-0.42
2000	-0.37	-0.16	0.00	-0.23	-0.41	0.93	-0.49	0.25	-1.37	0.25	-0.34	0.08	0.24	-0.23	-0.09	-0.38
2001	-0.22	-0.10	0.10	-0.01	-0.17	0.96	-0.42	0.26	-1.12	0.25	-0.30	0.13	0.26	-0.23	-0.12	-0.27
2002	-0.29	-0.07	0.05	-0.14	-0.28	0.94	-0.43	0.19	-1.30	0.16	-0.34	0.12	0.13	-0.42	-0.19	-0.35
2003	0.06	-0.01	0.06	-0.08	-0.10	0.93	-0.32	0.10	-1.06	0.14	-0.33	0.16	0.19	-0.41	-0.07	-0.26
2004	0.27	0.00	0.09	-0.03	-0.14	0.95	-0.26	0.10	-0.89	0.14	-0.32	0.17	0.25	-0.34	-0.08	-0.18
2005	0.58	0.06	0.20	0.13	0.06	1.00	-0.18	0.33	-0.15	0.57	-0.58	0.18	0.46	-0.15	-0.04	-0.02
2006	0.96	0.22	0.39	0.53	0.40	1.07	0.01	0.68	-0.27	0.01	-0.20	0.36	1.00	0.31	0.10	0.27
2007	1.13	0.35	0.47	0.66	0.42	1.12	0.10	0.92	0.30	0.31	-0.17	0.41	1.15	0.45	0.20	0.40
2008	1.17	0.42	0.52	0.78	0.37	1.16	0.16	1.11	0.48	0.96	-0.15	0.47	1.50	0.61	0.27	0.51
2009	0.41	0.16	0.26	0.15	-0.30	1.04	-0.08	0.67	-0.13	0.22	-0.23	0.26	0.86	-0.03	0.05	0.11
2010	-0.07	0.06	0.18	-0.13	-0.39	0.97	-0.24	0.58	-0.52	0.15	-0.34	0.18	0.46	-0.19	-0.04	-0.17
2011	-0.37	-0.07	0.07	-0.36	-0.62	0.91	-0.38	-0.01	-1.13	0.09	-0.39	0.04	0.15	-0.43	-0.18	-0.37
2012	-1.10	-0.34	-0.16	-0.90	-1.22	0.77	-0.69	-0.52	-1.90	0.01	-0.46	-0.10	-0.78	-0.90	-0.40	-0.75
2013	-0.96	-0.31	-0.20	-0.78	-1.02	0.74	-0.70	-0.49	-1.79	0.03	-0.49	-0.10	-0.71	-0.98	-0.37	-0.74
2014	-0.49	-0.15	-0.02	-0.30	-0.47	0.85	-0.45	-0.31	-1.45	0.13	-0.42	0.03	-0.15	-0.60	-0.19	-0.43
Average	-0.06	-0.02	0.11	-0.13	-0.36	0.94	-0.31	0.32	-0.87	0.16	-0.34	0.14	0.24	-0.30	-0.18	-0.22
Average	-0.02	-0.01	0.12	-0.10	-0.31	0.94	-0.30	0.33	-0.86	0.17	-0.33	0.14	0.26	-0.28	-0.19	-0.21
Average	-0.20	-0.03	0.09	-0.22	-0.52	0.92	-0.34	0.30	-0.90	0.14	-0.35	0.11	0.19	-0.36	-0.12	-0.26

Table 4: REGIONAL CYCLICALLY ADJUSTED NON-FINANCIAL BUDGET BALANCE (%GDP)

	Andalucía	Aragón	Asturias	Comunidad Valenciana	Cantabria	Castilla y León	Castilla-La Mancha	Cataluña	Extremadura	Galicia	Illes Balears	Madrid	Murcia	Navarra	País Valencià	La Rioja	Total CCAA
1984	0.21	0.41	0.19	0.41	1.46	-0.24	-0.10	0.36	0.63	0.03	0.31	0.01	0.55	0.66	0.37	-0.02	0.16
1985	0.14	0.13	0.35	0.26	-1.07	1.31	0.17	-0.33	0.67	-0.28	0.44	-0.14	0.47	0.18	0.12	-0.16	-0.45
1986	0.16	0.22	0.52	0.21	0.00	1.20	-0.17	-0.22	0.05	-0.55	0.36	0.02	0.68	0.26	0.24	-0.41	-0.39
1987	0.87	0.32	0.47	0.48	0.28	1.27	0.07	0.33	0.80	-0.24	0.44	0.09	0.71	1.40	0.13	-0.28	-0.12
1988	0.99	0.52	0.52	0.51	0.79	1.42	0.09	0.88	1.13	0.07	0.46	0.04	0.67	1.25	0.12	-0.10	0.02
1989	0.93	0.59	0.58	0.64	0.34	1.53	0.11	0.88	1.03	0.26	0.41	0.06	0.69	2.17	0.61	0.04	0.13
1990	1.37	0.55	0.53	0.85	0.21	1.49	0.04	0.95	1.17	0.30	0.46	0.11	0.81	1.63	0.68	0.25	0.15
1991	1.56	0.56	0.52	0.93	0.22	1.46	0.09	0.94	1.27	0.44	0.51	0.12	0.78	1.68	0.83	0.38	0.26
1992	1.25	0.50	0.57	0.77	0.37	1.46	0.07	0.91	1.24	0.46	0.51	0.08	0.74	1.55	0.82	0.41	0.27
1993	0.35	0.30	0.36	0.29	0.13	1.32	-0.05	0.26	-0.03	0.66	0.38	-0.04	0.58	0.41	0.08	0.24	-0.27
1994	0.21	0.25	0.33	0.12	-0.25	1.32	-0.20	0.04	0.77	-0.44	0.33	-0.07	0.54	0.26	-0.03	0.25	-0.41
1995	0.06	0.26	0.38	-0.01	-0.49	1.31	-0.01	-0.03	0.04	0.47	0.28	-0.05	0.46	0.34	0.01	0.22	-0.42
1996	-0.09	0.22	0.30	-0.12	-0.66	1.25	-0.15	-0.10	0.02	0.36	-0.41	0.24	-0.08	0.43	0.29	-0.22	0.13
1997	0.02	0.29	0.24	0.02	-0.70	1.25	-0.24	-0.11	0.03	0.32	0.32	-0.09	0.50	0.51	-0.11	0.19	-0.50
1998	0.12	0.29	0.35	0.24	-0.47	1.30	-0.19	0.20	0.07	0.48	-0.33	-0.01	0.56	0.72	0.14	0.25	-0.36
1999	0.11	0.21	0.24	0.29	0.06	1.32	-0.19	0.01	0.15	0.66	-0.41	0.44	0.00	0.54	0.70	0.31	-0.33
2000	0.32	0.24	0.32	0.34	-0.04	1.36	-0.23	-0.07	0.16	0.74	-0.55	0.49	0.02	0.58	0.95	0.37	-0.29
2001	0.46	0.29	0.41	0.55	0.19	1.39	-0.16	0.15	0.33	0.75	-0.32	0.48	0.05	0.63	0.97	0.37	-0.18
2002	0.39	0.32	0.37	0.43	0.08	1.38	-0.17	0.11	0.22	0.68	-0.49	0.41	0.02	0.82	0.85	0.19	-0.26
2003	0.72	0.38	0.38	0.48	0.26	1.37	-0.07	0.31	0.30	0.78	-0.26	0.38	0.02	0.85	0.91	0.19	-0.17
2004	0.93	0.39	0.40	0.53	0.22	1.38	-0.01	0.31	0.36	0.83	-0.09	0.39	0.03	0.66	0.97	0.26	-0.09
2005	1.23	0.44	0.51	0.69	0.42	1.43	0.07	0.54	1.04	0.21	0.43	0.05	0.72	1.17	0.45	0.32	0.06
2006	1.59	0.59	0.69	1.07	0.75	1.49	0.23	0.89	1.18	0.74	0.50	0.13	0.83	1.68	0.88	0.45	0.35
2007	1.75	0.71	0.76	1.19	0.76	1.53	0.34	1.11	1.30	1.06	0.54	0.16	0.86	1.83	1.02	0.53	0.49
2008	1.79	0.77	0.81	1.30	0.72	1.57	0.40	1.02	1.41	1.34	0.58	0.18	0.92	2.16	1.17	0.60	0.59
2009	1.07	0.53	0.56	0.70	0.07	1.46	0.17	0.87	1.17	0.64	0.46	0.11	0.74	1.55	0.56	0.40	0.19
2010	0.60	0.44	0.49	0.43	-0.02	1.41	0.01	0.51	0.38	1.05	0.26	0.40	0.67	1.16	0.41	0.31	-0.08
2011	0.31	0.32	0.39	0.22	-0.25	1.35	-0.12	0.21	0.09	0.74	-0.32	0.35	0.54	0.87	0.18	0.18	-0.28
2012	-0.39	0.07	0.17	-0.30	-0.83	1.23	-0.42	-0.29	-0.32	0.23	-1.06	-0.27	0.42	-0.02	-0.27	-0.02	-0.85
2013	-0.27	0.10	0.14	-0.18	-0.64	1.21	-0.43	-0.26	0.31	-0.95	0.29	-0.12	0.42	0.05	-0.34	0.01	-0.65
2014	0.20	0.24	0.30	0.27	-0.10	1.30	-0.19	-0.08	0.09	0.60	-0.62	0.38	-0.05	0.54	0.58	0.01	-0.34
Average	0.61	0.37	0.42	0.44	0.01	1.37	-0.06	0.33	0.29	0.81	-0.07	0.41	0.02	0.63	0.96	0.30	0.19
Average	0.65	0.37	0.43	0.47	0.05	1.38	-0.05	0.34	0.31	0.81	-0.06	0.41	0.02	0.64	0.97	0.32	0.17
Average	0.47	0.35	0.41	0.35	-0.15	1.36	-0.09	0.32	0.22	0.79	-0.10	0.39	0.00	0.61	0.91	0.25	0.24

Source tables 1-4: Own elaboration, based on data from final regional budgets (www.mihap.gob.es) and Regional Accounting (see www.ine.es).

Table 5: DATA SOURCES AND DEFINITIONS

Variables. Definition and calculation	
<i>Dependent</i>	
BB	Non-financial budget balance / GDP Defined as non-financial revenues minus non-financial expenditure (Σ Chapters 1 to 7 as to revenues – Σ Chapters 1 to 7 as to expenditure) / GDP regional.
PRIMA BB	Primary budget balance / GDP Defined as BB minus interest payments (chapter 3, expenditures).
CNBB	Cyclically-neutral non-financial budget balance / GDP Non-financial and cyclically-adjusted budget balance over the regional GDP
CNPRIMABB	Cyclically neutral primary budget balance / GDP Non-financial and cyclically-adjusted primary budget balance over the regional GDP <i>Sources: Spanish Ministry of Finance</i> <i>(http://serviciostelematicosext.minhap.gob.es/SGCAL/publicacionliquidacion/asp/menuInicio.aspx).</i> <i>And Spanish National Statistics Office, INE (see Regional Accounts for CAs GDPs).</i>
<i>Explanatory</i>	
<i>A) Cyclical position of the economy</i>	
Ogap	Own elaboration. We have calculated the regional CAs output gaps by using the Holdrick-Prescott (HP) with a $\lambda = 100$ filter coefficient.
Unemployment	Unemployment rate regional (active population survey). <i>Source: Spanish National Statistics Office, INE.</i>
<i>B) Other explanatory variables</i>	
Inflation	Consumer Price Index regional. <i>Source: Spanish National Statistics Office, INE.</i>
Debt	Stock of Debt (regional). As dictated by law (LOFCA), CAs ability to borrow is capped following the formula: ([25 (debt service payments / current revenues)]) / 100. <i>Source: Spanish Ministry of Finance.</i>
<i>C) Institutional constraints</i>	
BCS	Budget Consolidation Scenarios Dummy variable (1 for 1992-2001 and 0 otherwise).
BSA	Budget Stability Act (2001 and 2012) Dummy variable (1 for 2002-2014 and 0 otherwise).
Foral	Dummy variable (1 for the Vasque Country and Navarre and 0 for the other CAs).

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RESUMEN

En las últimas décadas, han tenido lugar numerosos procesos de descentralización en todo el mundo. Esto ha llevado a un impacto macroeconómico cada vez mayor de los presupuestos subcentrales. La literatura normativa sobre el papel estabilizador de los gobiernos subcentrales es muy abundante. Sin embargo, aún existe poca evidencia empírica sobre el sesgo de la política fiscal de esos gobiernos. Utilizando una función de reacción fiscal y aplicándola a un panel de datos de todas las comunidades autónomas españolas, encontramos evidencia empírica sobre el sesgo anticíclico de la política fiscal regional durante el periodo 1984-2014. Estos resultados contrastan con los obtenidos por la escasa literatura en la materia.

Palabras clave: prociclicidad, función de reacción fiscal, reglas fiscales, política fiscal multinivel.

Clasificación JEL: E62, E63, H62, H63, H72.

